

PRAKAB: 100 years of Prague Cable Company

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PRAKAB: 100 years of Prague Cable Company

“Technology means inventive creativity or, in other words, creating new economic or ideal life-related values based on science and knowledge. The results of technical... cannot just be by-products of imagination, they are inherently linked to the knowledge we have about natural forces and laws. Consequently, technical progress achieved in the future consists in the close link between scientific research and cognition; technology itself makes the small tools the reveal nature’s hidden secrets, which are incomprehensible to our mind. Both existing and future technology stands at the service of the well-being of mankind and liberates millions of people from the most ordinary and hardest physical work, which is taken over by machines.”

Emil Kolben, founder of PRAKAB

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(Ing. Tomáš Zieschang Ph.D., Mag. Alexander Tremmel,
Ing. Miroslav Tesař, Ing. Lucie Hladká, Ing. Mária Tér Hradecká,
Mgr. Zuzana Korbelová, Mária Machovičová)

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Foreword

Connecting people is one of the very best ways of promoting the progress of humanity. Prazska Kabelovna a.s., or PRAKAB as it is known for short, has been doing exactly this for one hundred years now. The book you hold in your hands tells this inspiring story, in all its richness and complexity.

It is first and foremost the story of people and their dedication to three essential forms of progress. Technological progress, first, where cables tell a story of continuous efforts towards better and safer performances. The Moore law, which famously measures the lightning speed of progress in electronic chips, can surely be extended to cables that often unknown but essential enabler of technological progress at large. And this story starts well before anybody could even dream of such things as a chip, a computer, let alone the internet. PRAKAB has been at the forefront of this growth since its starts. Famous figures such as Tesla have contributed to its innovative drive and PRAKAB still fuels many innovations in the SKB group.

The second pillar of growth for PRAKAB has been its ability to promote managerial progress, even in hard historical times, because it has been exports driven from its very start. These hundred years of commercial success make PRAKAB a symbol and a pillar of what is best in Czech entrepreneurship, an example of why the young Czechoslovak republic was one of the worlds biggest economies in the thirties and why it become succesful so fast after the fall of the communist regime.

This would not have been possible without the third pillar of growth, i.e. cultural progress. A company, especially an innovative and export driven company, can only thrive on cross fertilization between people of varied talents serving a common goal. The cultural dimension of progress is the most difficult to achieve in business and the only one which ensures sustainabilty in enterpreneurship. Technologies become obsolete. International markets fluctuate ever more quickly. To ensure sustainable growth, the long-term outlook and stability of a family-owned business, such as the SKB group, combined with the international diversity of its management and team, create an open corporate culture which explains how PRAKAB has survived and grown throughout the last hundred years of a tumultuous European history and why it can hope to continue to grow.

As XVIth century constitutionalist Jean Bodin wrote: “The only source of richness is in people”. People make succesful companies. Not technologies. May these first hundred years of corporate history enable PRAKAB, its people and its partners, to write the next pages of their common success, grounded in their technological creativity, their trust in each other and their common passion for connecting people. The times of smart cabling have only just started. Long live PRAKAB!

Constantin Norbert Octavian, Count Kinsky of Vchynice
and Tetov

Erinnerungen von Alexander Tremmel

**„Vaclav na hrad“
- was davor und danach
geschah**

Memories by Alexander Tremmel

**“Vaclav na hrad”
- what happened before
and what happened
afterwards**

„Vaclav na hrad!“ waren meine ersten tschechischen Worte, die mir im Gedächtnis haften geblieben sind. Wir schrieben den November 1989 – meine Eltern und mich als 25-jährigen Studenten hatte es zufällig nach Prag verschlagen. An ein Treffen mit den alten Bekannten meines Vaters aus der DDR in Budapest war nicht zu denken gewesen, da die ostdeutschen Behörden Reisen ins „unsichere“ Ungarn den eigenen Bürgern verboten hatte. So kristallisierte sich als kurzfristiger Kompromiss Prag heraus – die Hauptstadt gerade jenes Ostblocklandes, welches im Westen als besonders treuer Verbündeter der Sowjetunion galt. Mein erst zweiter Aufenthalt in einem kommunistischen Land sollte sich jedoch so ganz anders als erwartet entwickeln:

Überall Menschen mit leuchtenden Augen, Jung und Alt offenkundig durch ein gemeinsames Gefühl des Aufbruchs vereint. Unser Wagen blieb an der Zufahrt zu einer großen Freifläche in den dorthin strömenden Menschenmassen stecken. Nach einem kurzen „ich will hier raus“ fand ich mich auf der sogenannten „Letna“ wieder – am Tag der größten Demonstration in der tschechoslowakischen Republik zu den Zeiten der „samtenen Revolution“.

Der Menschenstrom hatte mich den Hügel hinunter zum Moldauufer gespült; dort eine Menschenkette, die nicht enden wollte: vom Zofin, über die Karlsbrücke, durch die Karlova bis zum Altstädterring. Und dann der Wenzelsplatz – Menschen dicht gedrängt, die sich ihre Hälse in Richtung eines kleinen Balkons verrenkten: von

dort sprach ein unauffälliger Mann mit Schnauzer. Da war er also, Vaclav Havel der berühmte Dissident und Autor mit seinem so gar nicht revolutionären Gehabe. Ihn wollten die Massen jetzt als Staatspräsident auf der Prager Burg als deutliches Zeichen eines Neubeginns sehen.

Warum aber sollte diese ganz offenkundig historisch einmalige Entwicklung mich persönlich betreffen? Noch hatte ich keine Ahnung, dass nur wenige Schritte entfernt am Wenzelsplatz vor über 100 Jahren bereits die Schwechater Kabelwerke (SKW) und die PRAKAB eine Niederlassung betrieben hatten. Ich selbst war nach meinem Betriebswirtschaft-Studium bereit für meinen Einsatz irgendwo im Ausland.

Natürlich kam es ganz anders: Mein Bruder Christoph war bereits ins Familienunternehmen eingetreten und der Meinung die historische Chance einer Investition in den ehemaligen kommunistischen Ländern nicht verpassen zu dürfen. Mögliche Targets wurden gesichtet, wobei uns jedoch die damaligen Großen der Branchen wie Siemens, Felten & Guillaume oder ABB meist zuvorkamen. Umso überraschender tauchte plötzlich die Möglichkeit auf, ein Kabelwerk in Prag zu besichtigen, um Gespräche über eine gemeinsame Zukunft zu beginnen. Groß war das Erstaunen meines Bruders, als ihm im Rahmen seines ersten Besuchs erklärt wurde, dass man ja über die gemeinsame Vergangenheit zwischen Kablo Hostivar und den Schwechater Kabelwerken Bescheid wüsste. Die große Frage war nun: ist nach der gemeinsamen Vergangenheit auch eine gemeinsame Zukunft möglich?

Bald war klar, dass dies eine große Chance und eine riesige Herausforderung zugleich sein wird. Hier will ein österreichischer Mittelständler ein flächen-, umsatz- und vor allem mitarbeitermäßig vielfach größeres Unternehmen kaufen, welches 40 Jahre in einem völlig anderen Wirtschaftssystem gearbeitet hatte. Unser Vater gab zwar nach einigem Zögern seine Zustimmung, bestand jedoch darauf, dass sich seine beiden Söhne diesen Herausforderungen stellen müssen.

Somit durften wir im Herbst 1991 das damalige Management von Kablo Hostivar anlässlich des 100-Jahres Jubiläum der SKW in Schwechat begrüßen. Die nachfolgenden nervenaufreibenden Kaufverhandlungen standen oft knapp vor dem Abschluss und ebenso oft knapp vor dem Abbruch. Im Sommer 1992 war es jedoch – nicht zuletzt dank der tatkräftigen Unterstützung des Managements – soweit: der Abschluss des Kaufvertrages war geschafft.

Nun ging es Schlag auf Schlag: Aufnahme der Produktion von Fernmeldeaußenkabel und Bahnsignalkabel, Errichtung eines völlig neuen Logistikzentrums, Bau einer weiteren großen Fertigungshalle, um den von Schwechat verlagerten Maschinenpark anzusiedeln und damit die Produktionseffizienz für 1 kV Kabel deutlich zu erhöhen. Und schließlich

die Errichtung des letzten neuen Hallenschiffes, damit die Erzeugung isolierter Freileitungen und anderer Produkte verbessert werden konnte. Danach erfolgte die Neugestaltung einer bestehenden Fertigungshalle, um eine fokussierte Erzeugung von FRNC-Kabel nach höchsten Standards zu ermöglichen. Damit konnte die Produktfamilie „PRAFla®“ aus der Taufe gehoben werden. Schlussendlich wurde im Jahre 2015 eine eigene PVC-Compoundierungsanlage eröffnet. In Summe wurden 2,5 Mld. CZK in den Standort der PRAKAB nach deren Übernahme durch die SKW investiert und die Produktionsfläche verdoppelt.

Zurück zu den Anfängen: Erst dank intensiver Spurensuche im Zuge der 125-Jahr Feier der SKW ist uns das ganze Ausmaß der engen historischen Verflechtung zwischen der PRAKAB und unserem österreichischen Stammwerk klargeworden – man kann diese Beziehung durchaus als im Gleichklang mit den Beziehungen der beiden Länder sehen: Verbunden waren Böhmen und Mähren mit Österreich für Jahrhunderte in der Habsburger-Monarchie. Auch der Beginn der Zusammenarbeit unserer Vorfahren mit dem großen tschechischen Entrepreneur Emil Kolben fiel in diese Zeit, als sich Kolben 1912 an den SKW, welche damals im Eigentum von Heinrich Eger standen, beteiligte. Das tschechisch-österreichische Verhältnis war oft von großen Spannungen gekennzeichnet, der Zusammenbruch der Monarchie als Folge des 1. Weltkrieges wurde daher in Prag als Befreiung und in Wien als Katastrophe wahrgenommen. Für die PRAKAB hingegen bedeutete dies ihr Geburtserlebnis, da zwei findige Unternehmer erkannt hatten, dass sich eine Zusammenarbeit über nationale Grenzen lohnt und man gemeinsam stärker ist. Das tschechisch-österreichische Joint-Venture florierte in der Folge und konnte trotz der vielen Krisen dieser Jahre auf einen Mitarbeiterstand von über 300 wachsen, sodass die Zukunft viel Anlass zum Optimismus bot.

Leider sollte es ganz anders kommen, und sowohl die Familie Kolben als auch die Familie Steiner-Eger – aufgrund der perfiden NS-Ideologie als jüdisch gebrandmarkt – mussten alsbald unter dem Sturm der nationalsozialistischen Eroberungspolitik schwer leiden. Unser Werk in Schwechat wurde sofort „arisiert“ und der PRAKAB erging es auch nicht viel besser. Beide Eigentümerfamilien hatten auch unter persönlicher Verfolgung schwer zu leiden, sodass etwa sowohl Emil Kolben als auch unsere Urgroßmutter und Witwe des Firmengründers der SKW, Otto Steiner, im Lager Theresienstadt zu Tode kamen. Fast zeitgleich sind damals auch beide Staaten vom Erdboden verschwunden – sicher mit dem großen Unterschied, dass die Österreicher dem neuen Regime größtenteils mit heller Begeisterung gegenüberstanden.

Die Ausgangslage für den Neubeginn nach der Katastrophe des 2. Weltkrieges schien für die PRAKAB ungleich besser zu sein:

In der Zwischenkriegszeit war die Tschechoslowakei eine der größten Volkswirtschaft der Welt gewesen und das Land war kaum durch Bomben zerstört worden, Österreich hingegen lag am Boden. Aus persönlicher Sicht sollte es dennoch anders kommen: Während die SKW 1948 an unsere Familie restituiert wurde, hatte noch Emil Kolben im Angesicht des deutschen Einmarsches die PRAKAB an die Krizik-Chaudoir Werke verkauft. Somit hatten sich beide Länder, sowie beide Unternehmen für die folgenden über 40 Jahre wieder voneinander abgewendet.

Was haben wir aus diesen vielen Jahrzehnten – 130 Jahre SKB-GROUP / 100 Jahre PRAKAB / 30 Jahre SKW-PRAKAB – unserer Geschichte mitgenommen?

Manchmal kommt es anders als man plant, genauso können jedoch Vorhersagen auch zutreffen: mein Bruder und ich versprachen uns vom Erwerb der PRAKAB nicht nur Zulieferungen für den österreichischen, sondern vor allem den Eintritt in den vielversprechenden tschechischen Markt, der eine große Vergangenheit hatte und eine große Zukunft versprach. Heute können wir festhalten, dass diese Vorhersagen eingetroffen sind.

Österreich und Tschechien waren und sind eng miteinander verwoben, was die Schicksale der Gründerfamilien der SKW und der PRAKAB auch sehr gut veranschaulichen. Die Ursprünge der Familien Kolben, Steiner und Eger lagen im damaligen Böhmen, sodass man etwas versonnen behaupten kann, dass die Übernahme der PRAKAB für uns eine späte Heimkunft darstellt. In jedem Fall haben wir im Zuge unserer hundert Besuche Land (speziell die Goldene Stadt Prag) und Leute, die wir nicht missen wollen, kennengelernt. An dieser Stelle müssen und wollen wir uns, stellvertretend für die gesamte Mannschaft der PRAKAB, ganz besonders bei Antonin Novak und Jaroslav Krnak bedanken, die uns bei der Übernahme und noch viele Jahre danach zur Seite gestanden sind und bei Tomas Zieschang und Daniel Heidler, mit denen wir in den letzten Jahren eine sowohl professionell als auch persönlich besonders angenehme Zusammenarbeit aufbauen konnten.

Für unsere SKB-GROUP wäre der Aufstieg von einem mittelständischen Unternehmen mit 30 Mio. EUR Umsatz zu einer Unternehmensgruppe mit fast 300 Mio. EUR Umsatz ohne die Akquisition der PRAKAB unmöglich gewesen. Daneben sind wir aber auch der Überzeugung, dass unser Wertegerüst dazu beigetragen hat als nunmehr fünfte Generation der Gründerfamilie die Geschicke der Gruppe erfolgreich führen zu können: Tradition, Zuverlässigkeit, direkte und vertrauensvolle Kommunikation sowohl mit unseren Mitarbeitern, als auch mit unseren langjährigen Kunden.

Was erwarten wir uns nun von der Zukunft der PRAKAB im Verband der SKB-GROUP:

Was unseren tschechischen Heimmarkt betrifft stellen wir an uns selbst den Führungsanspruch und wollen in den nächsten Jahren an die Spitze gelangen. Das wird uns mit der Unterstützung der Gruppe auch gelingen. Gleichzeitig werden wir uns noch stärker auf unsere drei Entwicklungspfeiler stützen und diese sowohl in Tschechien, als auch in unseren Auslandsmärkten vorantreiben:

- Das Energiekabel als Herzstück des Ausbaus der Energieinfrastruktur macht das Gelingen der Klimawende erst möglich. Hier wollen wir mit unseren Produkten in allen unseren europäischen Märkten ganz vorne dabei sein
- Mit unseren „PRAFla®“ Sicherheitskabeln werden wir in den mitteleuropäischen Ländern das Maß der Dinge sein
- In ausgesuchten Märkten werden unsere Eisenbahnsignalkabel ein unabdingbarer Bestandteil des Ausbaues der Bahnstrecken sein

Wir als PRAKAB und SKB-GROUP sind der festen Überzeugung diese hochgesteckten Ziele dank der festen Basis auf der wir stehen, bestehend aus unser Tradition und unseren Werten, auch erreichen zu können und sehen den kommenden Jahrzehnte daher optimistisch entgegen.

Mag. Alexander Tremmel
Managing Partner SKB-GROUP

**About science,
history, people,
entrepreneurship,
technology,
eras of time
and the future**

The cable is at the beginning of our story. Cables consist of conductors, cores, shielding materials and sheath. A conductor is a conductive metal wire covered with an electrically non-conductive, i.e. insulating material along its entire length. Winding wires into a bundle forms a cable core, and wrapping this cable core with a shield gives us a cable. Let's spin the metaphorical cable cores of the story about a factory, as they have been spun together for a hundred years. Let us follow the lifeline, this line at the very special place, the line of events, the line of human fates, the line of technical subjects and the line of historical events. Let's add a line of the present and future to this story. And let's connect these lines into the essence of an interesting story showing the century-long cable history at the Pražská kabelovna cableworks.

Chapter 1

**It simply
wouldn't
work without
electricity
or From
Gilbert
to Einstein**

Had it not been for electricity, had it not been discovered, PRAKAB would never have existed. There would be no such company, and the founding fathers would have probably done something entirely different with their life. But not just them, the entire world would undoubtedly be profoundly different. Although this book does not in any way strive to become a textbook or a scientific publication, we may look back on the discoverers of electricity. Those who maybe unknowingly paved the way for the foundation of PRAKAB, and who also laid the cornerstone of our entire modern era. The names of some of these gentlemen are commonly used today, and we know them because of physical quantities that were named after them.

The first to actually coin and introduce the terms electricity, as well as magnetism, was **William Gilbert**, a prominent physician and physicist born on 24 May 1544 in Colchester, England. He was born into a family of a judge, and thanks to his well-off family, he studied at and graduated from the University of Cambridge, where he obtained a doctorate in medicine in 1569. He was keen on his hobbies – chemistry and physics. His famous work *On the Magnet and Magnetic Bodies, and on That Great Magnet the Earth* was issued in 1600. He describes a total of 600 experiments on the magnetism of bodies in six books. This work is written so carefully and properly that most of the described discoveries have remained valid to this day and are still being taught without major changes. He derived the term “electricity” from the Latin name amber (electron), which he used for his experiments as a magnetically active substance. Gilbert builds on the work of older inventors, namely the French monk **Peregrinus** from the end of the 13th century, or **Robert Norman**, a sailor who dealt with the construction of a magnetic compass. Yet Gilbert was the first to describe magnetism and electricity systematically and to prove them in practical experiments. He was the first to detect the Earth’s magnetism and to calculate the position of the Earth’s magnetic poles. He achieved high medical posts, he was the personal physician of Elizabeth I, and he also treated James Stuart’s after her death. He died of the plague in 1603.

After this, for almost an entire century it seemed as if nothing had happened with electricity. The Reformation began. The horrifying Thirty Years’ War swept through Europe, and humanity faced several plague epidemics. The world had changed, heading for the French Revolution, people were freer in thought, and with the new era arriving, they suddenly remembered the unused discovery. As if scientists, teachers and professors in the middle

18th century had suddenly rediscovered electricity and started to follow Gilbert. We will probably never learn how and why such interest in new science arose in various parts of Europe. However, what is certain and interesting is that virtually everything essential to the new scientific and technical subject was discovered and established in just sixty years during the second half of the 18th century and at the very beginning of the 19th century.

Alessandro Giuseppe Antonio Anastasio Volta was one of the first outstanding characters in this field. He was the seventh child of a Lombard nobleman born on 18 February 1745 in the town known as Como in Italy today. He didn't learn to speak until the age of seven, yet he graduated from the Royal Seminary in Como becoming head of the Lyceum and a physics professor. He taught in Como and at the University of Pavia. Being a physicist, he focussed on electrical phenomena, and as part of many of his practical experiments, he built an electric cell, the very first battery known as the Volt Column at the time. He classified metals according to their electrical properties, improving the capacitor and discovering how electricity is generated by friction. He personally knew Napoleon Bonaparte, who promoted him to the rank of count and made him a senator. The basic electrical voltage unit, the volt, is named after him. He died of a stroke in 1823 in Como.

Another person from the history of electricity is a Frenchman – **André Marie Ampere**: a prodigy with a truly extraordinary universal talent. He was born into a family of a prominent merchant in the French town of Lyon on 22 January 1775. He was taught by his father himself, and at the age of thirteen he published his first scientific works. He became a private mathematics teacher, focusing on astronomy, physics and chemistry. He gradually became a professor of mathematics, physics, chemistry and astronomy. During the French Revolution of 1793, his father was executed for having allegedly sympathised with the Royalists, which was hard on Ampere. He taught at major French universities in Lyon and Paris, he became a member of the French Academy of Sciences, a Knight of the Legion of Honor, and a member of the Royal Society of London. Though he was an excellent mathematician, he achieved the most acclaim for his discoveries in physics. He built on the work of his contemporary, Danish scientist **Hans Christian Orted** (1777 – 1851), who discovered that when electricity flows through a conductive wire near a magnetic needle, it is deflected and, conversely, that the movement of the magnet exerts force on the conductive loops.





Ampere further developed these findings, verifying them through other experiments and laying the foundation for electricity being used practically. His conclusions from experiments with magnetic forces exerting their power on a conductive body led to the description of electric current and its origin. He conducted experiments with an electric coil and built a galvanometer, a “commutator”, as a basic electromagnetic machine component. This started a new area in physics – electrodynamics. The Scientific Congress in Chicago held in 1893 approved his name as the basic unit of electricity. He died on 10 June 1836 in Marseille. His son, **Jean-Jaegues Ampere**, continued his work and became the first to use the term “*cybernetics*”.

On April 30, 1777, **Johan Carl Fridrich Gauss**, another genius, was born into a poor family in Braunschweig, Germany. The Duke of Brunswick Charles II recognized his mathematical talent and supported him in his studies at the technical universities of Braunschweig and Göttingen. He was a phenomenal mathematician and became famous for his number theory, error distribution, algebra methods and arithmetic. He was able to accurately calculate the motion of the asteroids discovered at that time, and as an astronomy professor, he was the director of the Göttingen-based observatory. He was the first to theoretically admit the existence of otherwise curved geometric spaces, disrupting the hitherto recognized single geometry and laying this way the foundation for the theory of relativity. He linked his observatory to a city 1.2 km away with the worldwide first electromagnetic telegraph. He constructed this device with his fellow professor **Wilhelm Weber**, with whom he stipulated the unit of magnetism based on the knowledge of relations between matter, size and time. Measuring the Earth’s magnetic field, he discovered and mathematically documented the Earth’s magnetosphere as the source of this field. He actually calculated and thus paved the way for magnetism to be used practically. The magnetic induction unit, one gauss, is named after him. He died as a respected genius scientist on 23 February 1855.

On March 16, 1789, another remarkable physicist electrician, **Georg Simon Ohm**, was born in Erlangen, Germany. Although he had six siblings, his father arranged for him to study at the University of Erlangen. He studied mathematics, chemistry, physics and philosophy. Upon receiving his doctorate, he started teaching at the University of Cologne. Here he started electricity research, and in 1827 he formulated a law on the passage of electricity through an electric circuit. In general, he

described which way electric voltage causes electric current to pass through an electric conductor and what fundamentally affects this passage. His law was so simple that the scientific community didn't want to adopt it at all at first. It was not until the Royal Society of London awarded him for his work that his work achieved recognition throughout the world. Today Ohm's law is still a basic, irreplaceable rule for handling electricity. In 1881, at the first International Electric Congress, the fundamental electrical resistance unit was named ohm after him. Georg Simon Ohm died on 6 July 1854 in Munich.

We cannot mention every single researcher or discoverer from this field, but we need to pay homage to **Michael Faraday**. This son of a poor blacksmith was born on 22 September 1791 in the suburbs of London, and he became a bookbinder's apprentice. He showed an interest in science. The well-known chemist Humphry Davy recognized this, employing him as his assistant in the chemical laboratory at the Royal Institute in London. Faraday did not receive mathematical education, and most of his discoveries were experiment-based. However, he was able to precisely describe his experiments, and his records are still stored in the Royal Society archives. He was appointed Director of Laboratories at the British Academy of Sciences and became a Professor of Chemistry at the Royal Military Academy. In the course of his experiments, he discovered that electric current flowing through a wire is able to generate an electromagnetic field. He tried to prove that this works the other way around as well, i.e. that electric current can be induced by magnetic force. Succeeding in doing this meant that he discovered electromagnetic induction. He demonstrated that magnetism and electricity are two manifestations of the same phenomenon – electromagnetism. His three-volume publication *Experimental Researches in Electricity* describes 3,362 experiments. It forms the basis of most electromagnetic phenomena practically used today, and it is the foundation for all rules of electricity generation and use. Faraday's experiments were later mathematically described by a Scottish physicist named **James Clerk Maxwell** (June 1831 – November 1879), who theoretically described both the electromagnetic field and its properties. Faraday was a very modest man who even refused to be appointed a nobleman by Queen Victoria. He died on 25 August 1867 in London. On 22 September 1881, the International Congress in Paris named the basic electrical capacity unit one farad after him.

Reading these brief biographies, we will certainly notice several interesting contexts. One of the first links is the finding that a science subject as young as electrical engineering has its foundations in a rather deep past. The monk Peregrin was playing with a compass needle at the time when Charles IV's reign had just ended. When Mr. Gilbert actually named electricity, Emperor Rudolf II was reigning the country. Many of those to have drafted the main laws of electricity were actually Maria Theresa's contemporaries, and some of them even knew Napoleon Bonaparte personally. Another interesting fact is that most great discoveries about electricity, like those mentioned in the introduction, were made within a very short stretch of time. Please also note that with the exception of Faraday, for whom Maxwell had to jump in as far as mathematics is concerned, all the discoverers were great mathematicians and often astronomers as well. This is probably due to the fact that both magnetic forces and the associated particles' electrical properties apply to the smallest particles of matter just as much as they do to the sun, planets and the universe. The reason is the fact that this miraculous invisible force is always here and has ever since been here along with other forces in matter and in the universe. However, only a very bright observer was able to discover, theoretically describe and prepare for such a power being practically used, if he was able to calculate and generalise such discoveries. Only people having these abilities were able to show us and prepare us for this natural force and energy that we can no longer live without.

We also mustn't forget that had it not been for the magnetic and electrical forces discovery, and without the discovery that these forces act on particles of matter, it would not have been possible for Einstein to formulate the theory of relativity. Magnetic action on particles distorts space, and everything we consider to be, simply speaking, "normal" is simply not true anymore in rectangular three-dimensional geometry. Without knowing Gauss's theoretical work, **Albert Einstein**, who was born on 14 March 1879 in Ulm, Germany, would not have been able to arrive at his Theory of Relativity, Quantization of Electromagnetic Fields, and Photoelectric Phenomena. He thus would not have been able to move our knowledge of the universe and human thinking to another, far more accurate and useful level.

Chapter 2

Users and practitioners

It was thus that a discovered, theoretically verified phenomenon saw the light of day. The first devices for generating electricity, the first battery, commutator, capacitor, electrical circuit, coils and galvanometer were designed based on thousands of experiments. And yes, Gauss and Weber had already built the first telegraph. However, it was necessary for entrepreneurs or industrialists to grasp the new inventions and figure out how to use electromagnetism in practice. They founded their business in order to discover what electricity can help us with in our daily lives, becoming rich and famous.

The first thing brought by thanks to the knowledge of basic properties of electromagnetism was that this phenomenon began to be used for remote communication. This is logical; when a magnet moves near a conductive wire, an electric current is formed inside it, which in turn impedes the magnetic needle, deflecting it. Inventors realized that signals may be transmitted across long distances using electromagnetism. With a sufficiently conductive wire, this distance may be up to hundreds of kilometres. Long-distance communication has been used ever since. The Indians used tamtam drums, other nations used simple megaphones (or tubes) or smoke signals. Animals like whales communicate via sounds across thousands of miles, elephants stomp and gorillas beat their breasts. And now there was electric current, electric signal. **Carl August von Steinheil**, born on 12 October 1801 in Ribeauvillé, Alsace, France, a physicist and astronomer whose nationality is a matter of discord between the Swiss and the Germans, worked hard on further developing Gauss's telegraph, building the first recording telegraph in 1836. This means that there was no longer simply a magnetic needle moving around at the recipient's place, there was a device recording the received signal on paper. The machine operated at a rate of six words per minute, and it was able to write German words. **Samuel Finley Bueese Morse** (April 1791 – April 1872) from America, who established a standardised record of dots and commas for telegraphy, the Morse code, perfected this. This tremendously accelerated transmission, and the telegraph started transmitting messages letter by letter in all languages. The new invention spread at great speed, and by the mid-nineteenth century, there were already dozens of thousands of kilometres of wires installed all around the Earth between telegraph stations. These were yet non-insulated overhead lines, which were consequently very sensitive to damage, creating the need to insulate the wires. The first wires were created.

Whereas some tried long-distance communication using electromagnetism, others realized that electricity could be used for even more interesting things. Here we would like to discuss a bit of theory; a small technical insert so been simplified that we apologize in advance to all readers-experts for this simplification.

If we can at least basically imagine what electric current is using a simplified approach, how electric current acts on various substances and what happens to these substances then, we will come to understand how many electrical devices that commonly surround us today actually work, helps us in understanding the principles behind them – including how and why they were discovered. We will come to understand what the first discoverers and inventors actually discovered and began to use industrially afterwards. We can explain a lot using the laws described by Ohm. As we have already said, these are so simple that other scientists didn't want to acknowledge them. In this case, it's the relationship between electrical voltage, electric current and resistance, posed by an electrically conductive material to the electric current that's passing through it.

Voltage

Let's start with electrical voltage, usually indicated with a U , the basic unit of it being one V (volt). This is the difference in electrical potentials, i.e. the difference between the magnitude of the positive and negative charge. In practice, this refers to the difference between the positive and negative battery poles, the difference between the ground and a charged cloud during a storm. Positively charged and negatively charged particles are strongly attracted to each other. The stronger the charge, the stronger these forces are. An electrical charge can be achieved by moving a magnet or magnetic field near a conductor, by friction, via a chemical reaction or by exposure to light. We can charge using a generator or dynamo, create a charge chemically in a battery, or store it in a capacitor. As long as the two charged poles are separated from each other by a non-conductive medium keeping them at a sufficient distance, or by a substance that does not conduct electricity, i.e. an insulator, nothing happens. This is similar to filling a tank located at a significant higher altitude with water and closing the drain taps. The water cannot come out, it stays on top and exerts pressure on the vessel in which it is thanks

to gravity, as well as on the valve that holds the water inside the vessel. This water has great potential to get down and level out with the Earth's surface. The water got this potential from a pump that pumped it up exerting work. It's the same as when a generator charges a battery generating voltage this way. When the valve is opened, water starts flowing rapidly through the pipes down to lower places below until the levels are finally evened out. A very similar thing happens if we connect electrically charged opposite poles with conductive material. This establishes an electrical circuit through which an electric current starts to flow until both poles are electrically aligned. Yet there is one fundamental difference between flowing water and flowing electricity: water can be transferred as it flows through a pipe, a tank located at a higher altitude is emptied and the one placed lower is filled. Although electricity creates an electric current flowing through a conductor, such as copper wire, nothing is displaced, the wire doesn't become shorter, the battery is not drained. Simply speaking, no matter moves. And no earthly attraction will affect this. The electric current flows up, down, to the right, to the left, simply where the electric wire allows it to do so. Why is that alike? What actually creates this current? Electric current can only flow through a conductive medium or a conductive substance called a conductor. Each substance consists of particles, molecules, atoms and components of atoms. Atoms form a so-called atomic lattice, which means that in the case of solids, they are assembled into solid structures, where each atom has its own position. With liquids, the situation is the same, yet the atoms form looser bonds with each other and move within the space of the liquid – they flow. In the case of gases, the bonds between the atoms are entirely free, which means that the clusters of atoms move freely around each other, making the gas flow. Some solids, liquids and gases can be electrically conductive – we call them conductors. Other solids, liquids or gases may be non-conductive – called non-conductors or insulators. So, what is the difference? Each atom consists of a nucleus and even smaller particles revolve around it. Even when the atom is firmly embedded in the corner of a solid lattice, small particles keep revolving around its nucleus. To give you an idea, this very much resembles the solar system, although it's not entirely the same. The sun is the core and various planets revolve around it on their orbits. Another star has yet other planets, and this is the way the entire universe is constructed, just like the matter of any substance. And some of these tiny particles, these asteroids, can even be electrically charged. We

call them electrons, and they always carry a negative charge. These negatively charged particles revolve around the nucleus of the atom together with other, uncharged, particles. The nucleus of such an atom always has a positive electrical charge, holding the electrons on the orbit around itself. Only conductive substances have these electrons. Non-conductive substances do not have them, which is why they are unable to conduct electricity. Small particles also revolve around the atoms of these substances, yet none of them can be electrically charged, there is no electron.

Electric current

So, if we connect a substance that has electrons to an electric voltage source, the electrons in that substance charge and start transmitting an electric charge either to each other, or they start to flow towards the positive pole themselves. This effect lasts as long as the electrical voltage is applied. We call this current an electric current; we usually label it I , and its basic unit is one A (ampere). Consequently, no matter flows or overflows. The conductor doesn't get lost, nor does it appear elsewhere. A more inquisitive observer would ask how electrons actually pass on the charge. This is still a quite unexplored area. They have to get closer to each other, and their charge (imagine it as a magnetic field around a particle) jumps over to a particle in a neighbouring atom, which transfers it in its orbit to the other side, where it meets another particle to pass the charge on again. Or, the electrons break out of their orbits and start flowing towards the positive pole, where they discharge. This cannot happen with substances lacking electrons, which therefore do not conduct electricity.

Electric resistance

And there is the third quantity of Ohm's laws: electrical resistance. This is a fundamental electrical property of conductive materials. We label it with the letter R , and its basic unit is one Ω (ohm). Insulation resistance is the basic electrical property of non-conductive materials. Basically, it is a question of how much electric current the charged particles in the conductor are able to transmit at once. This value is affected by how many of them are next to

each other at once, which means how many of them transmit a charge in one cross-section of the conductor at a time. This brings us to the cross-section size. The larger the cross-section area, the more electrons there are – this is purely a matter of space. And the second fundamental property is the number of electrically charged particles, which the substance itself contains by its very chemical nature. This is called electrical conductivity. It is necessary to imagine that even in the most conductive substances, not all atoms are circled by rotating electrons, just like not every star has an Earth among its planets. Some substances contain more particles, while others contain less. It's also a matter of the conductive substance purity. If there are admixtures, impurities from other substances with electron-free atoms, the number of actively transferring particles becomes limited. It is interesting that metals figure among the most conductive substances on Earth, and that the rarer the metal, the better the conductor is. Aluminium, steel, copper, silver, gold and platinum are good conductors. This is why wires are mostly made of copper and aluminium, while the contacts are made of silver, in computer technology they use gold, and platinum is used in the best devices. As far as non-metallic substances are concerned, carbon is a good conductor. However, some liquids, including water, are conductive as well. As water does conduct electricity, injuries can occur. The human body and that of any mammal is composed of up to 80% of water, so electric currents can pass through them. Even air, if humid, saturated with water, can carry a current. A gas such as neon is also a conductor. If electric current passes through such a gas, a visible discharge is generated as the gas, where the particles are far away from each other, starts glowing as electricity is transferred. This phenomenon is not seen as frequently in liquids and solids. A small discharge is a spark. When a spark jumps over between contacts, it can ignite its surroundings – which is how petrol cars work.

Large current passage constraints occur at transitions from one conductive environment to another as well, i.e. at electrical circuit junctions. This is called transient resistance. In these places, congestion is similar to that at border crossings. Electrons are forced to transfer charges across these junctions through a poorly conductive section, or to electrons in other conductive substances that have a different charge absorption ability. This slows down transfers. The places we are referring to here are known as connectors, contacts, screw connections and soldered connections – in short, all places within an electrical circuit where various conductive environments are mechanically

connected. If the electric voltage is significant, the charge transfer between the particles happens quickly and intensely, while narrow places get crammed and the process inside the matter is intense. All the more, the conductive substance heats up. This is quite understandable, as every particle movement generates heat, and the voltage can move the electrons around the nuclei nicely. The larger the pressure in small cross-sections or at transitions, the greater this heat is. It can generate such heat that the conductive substance starts shining, glowing, burning, and it may even burn down. While current passes through the conductor, a strong magnetic field is created around it.

Electric arc and light bulb

Knowing about these events, exploiting them immediately comes to our mind. After all, if current passes through a conductor, the conductor can even start to glow. The first ideas we get are related to conductive gas. The blast glows and everybody sees it. All you have to do is create an artificial discharge, a small manageable discharge easy to handle, i.e. a controlled electric arc. This brings us to **František Křižík** (July 1847 – January 1941) and his arc lamp. A glass where there are two electrically charged contacts that can be mechanically moved towards each other. We move and move them until the spark jumps over, we move them a little bit apart again, the arc stretches and a light starts to glow. The arch shines like the sun. No other lamp has ever emitted such a glow yet. Night turns into day.

But this lamp is a bit impractical, it is difficult to light it up, the mechanism is bulky, the arc fluctuates. **Thomas Alva Edison** (February 1847 – October 1931) sought a solution for the irradiating solids. He only had to reach such a temperature in one spot of the solid conductive substance so that the place would glow. A thin wire within an electrical circuit glowed beautifully, but just for a moment, burning down afterwards. Edison knew that carbon burns badly and is a good conductor, so he started plugging various organic materials into an electrical circuit. When fixing a piece of wool thread into it, it first burned down into coal, whereafter this coal started to glow. It glowed and glowed, until someone gave it a push and the charred fibre fell apart. It was sensitive to shocks, which again proved quite impractical. Burning meant that the fibre oxidized rapidly at high temperatures,

reacting with oxygen. Edison figured out that there mustn't be any oxygen around the glowing element, no air at all. He therefore put everything in a glass flask, from which he sucked all the air out. This is said to have been the first light bulb in 1879. And that's the same principle, ordinary resistance light bulbs are still shining today. Yet, as is the case of many inventions to exploit electricity, this story is not entirely true. It is said that the first light bulbs were tested in 1802 by **Humphry Davy** (December 1778 – May 1829), an English chemist and founder of electrochemistry, who discovered the electric arc in 1801, by the way. Another one to try his luck with the light bulb was **Heinrich Göbel** (April 1818 – December 1893), a watchmaker from Hanover who was living in the USA. Göbel even tried to sell his inventions to Edison, but he refused. In the end, there was a dispute about the right to manufacture the light bulb between Göbel and the Edison Electric Light Company, which was only terminated as late as in 1893 in favour of the latter company. Since then, tradition says that the light bulb was invented by Edison, which may or may not be true, but in any case – Edison was the first to patent it. The first publicly lit light bulb had a radiant element made of a bamboo filament, lit up on 21 October 1879, and it lasted for forty hours.

Direct and alternating current

We cannot delve into describing the origin of every single electrical invention, yet given the topic of our book, we should mention another major, significant dispute from the beginnings of the use of electricity, called the “War of the Currents”. It features Thomas Alva Edison again, and the dispute also happened in the USA. Given the ever-increasing number of electrically powered machinery inventions, the need to produce and transmit electricity logically increased. This means that electricity could not be consumed right next to a dynamo or a generator anymore. Dynamos or generators require a source of force to rotate. These were initially hydroelectric power plants. Given the principle of water mills, the energy of water was used very quickly to spin machines designed to produce electricity, which meant dynamos for direct current or generators for alternating current. One of the first major power plants was built by a company belonging to George Westinghouse right next to the Niagara Falls, and it powered the lights of the World's Fair, running on AC power.

George Westinghouse (October 1846 – March 1914)

was a very interesting person. At this moment, we should stop to briefly introduce the terms AC and DC and also remember Mr. Westinghouse. As mentioned earlier, in order to provide electric current flow through a conductor, electric voltage needs to be created at its ends. The higher the voltage, the more electric current flows through the conductor. The first circuits were direct current ones. Direct current means that voltage is created between two poles (positive and negative), and these poles do not change their polarity. The positive pole remains positive and the negative pole remains negative. Electrons in such a circuit always flow in one direction, i.e. to the positive pole. There can be only two electrical statuses: connection to voltage, i.e. current flows, and disconnection from voltage, i.e. the current does not flow any more. It is also possible to set the size of the connected voltage and that's all. A flashlight is a practical example. On means that the light is on, off means that it's off. This principle (DC – Direct Current), which, as we will show below, is still widely used today, but it has never been suitable for long-distance electricity transmission. This is mainly due to the fact that direct current is difficult to generate, and also because it is easier to attenuate direct current within a conductor. In fact, it doesn't transgress a great distance. This caused many problems during the first attempts to conduct this type of current. However, if we use alternating current, long-distance transmission becomes significantly easier. In the case of AC power transmission, the connected poles' polarity changes – alternates. The positive pole is continuously changing to negative, and the negative pole in the opposite direction keeps changing to positive. The voltage pulsates from the positive pole through zero voltage into negative values. As such a voltage is generated by a rotating machine, an electric generator, these changes follow a regular sinusoidal curve as the generator rotates in the course of time. Consequently, alternating current (AC) has a sine wave as a mark. The faster the generator rotates, the more rapidly the current oscillates from the positive to the negative pole. This oscillation needs to be set and agreed, as even the connected electrical machines (appliances) to which the current is supplied have to be designed and set for this oscillation. In Europe, for example, it is common to use an agreed frequency of 50 hertz. This is written on each appliance's label. As far as AC voltage is concerned, it is possible to generate a voltage of many thousands of volts, facilitating transmission across long distances. Since the current does not always flow in one direction

and the electrons in the circuit actually keep oscillating to and fro, it is also easier for the electric charge in the conductor to be transferred, and it is thus also easier to transfer the charge across longer distances. In order to be able to continue to safely use the electrically transmitted high-voltage current, this transmission has to be reduced to a suitable lower level. Transformers are used for these purposes. Transformers are devices using electric fields properties to convert electric voltage to a higher or lower voltage. Consequently, today's electrical distribution networks usually have several levels of applied and connected electrical voltage. From the generator to the first transformer in a power plant, this is so-called primary voltage, and the transformer converts it to high voltage, which is conducted via high voltage poles from the power plant to distant places, where it's reduced at transformer stations somewhere in fields by other transformers to medium voltage (usually 22,000 V), and the medium voltage overhead line leads it to a city, municipality or factory, where it is further reduced to low voltage (1000 V) by a local transformer; from then on it is mostly routed by ground cables. The local transformer then reduces this voltage to the usually applied 240 V (for household), or 400 V (in the industrial sphere or for powering motors in workshops). Most of today's electrical grids in the world run on AC power. The problem with these wirings, however, is that high AC voltage is very likely to become lethal. And this fact has often been used as a strong argument in the War of the Currents.

George Westinghouse (1846 – 1914) was a very interesting person, and it is a pity that he is frequently placed in the historical shadow of his great rival, Thomas Edison. He was born into a locksmith's family, joined the army as a young man and fought in the American Civil War. He later served in the Navy on a gunboat. Upon returning home, he was found to have an engineering talent, and he designed a rotary steam engine. This is a small steam engine suitable for small-scale workshops or farms. Westinghouse founded a company and successfully manufactured and sold this machine. He once witnessed the collision of two trains. The drivers saw each other from a great distance, braking with all their might, but they were still unable to stop the trains and prevent the serious accident. Based on this experience, George Westinghouse designed an automatic pressure train brake. This is a device that is still used even in the most modern and fastest trains. He started manufacturing a brake system and successfully selling it to train producing companies, also providing lots of new track equipment. It is clear that young Mr. Westinghouse did not yet truly get in

touch with electricity. It was not until the early 1890s that he became interested in a new area, namely electricity distribution. Electric lighting was a growing industry; there were many companies manufacturing outdoor direct current and alternating current systems. In 1884, Westinghouse started developing his own DC lighting system, hiring **William Stanley** (November 1858 – May 1916), a physicist, to work for him. Westinghouse got in contact with European AC systems in 1885 when he read about them in the British technical journal titled *Engineering*. Westinghouse realized that together with transformers, AC power would help achieve greater savings and high transmission voltage, and enable large central power plants. To him, this was a way of setting up a truly competitive system. He put a lot of assets and money into this and, quite logically, got into a dispute with Edison, the DC network promoter and operator.

The War of the Currents

The War of the Currents was actually a trade conflict as well as a technological dispute that took place in the United States in the late 1880s and early 1890s about which one would become the standard for electricity distribution: direct current or alternating current. The main actors were Edison Electric Light Company and Westinghouse. Edison favoured direct current, Westinghouse alternating current. The three most visible aspects of the dispute were fierce competition, a series of fatalities caused by AC power lines, and behind-the-scenes political manoeuvres. During the late 1870s, electric arc-based outdoor lighting systems started spreading. In 1882, Thomas Alva Edison started installing low-voltage direct current systems to replace gas and kerosene lighting systems commonly used in households. In 1886, George Westinghouse started constructing a system based on alternating current, which represented a more efficient and cheaper solution than that provided by the Edison system. Alternating current expanded rapidly, and the number of companies providing it rose. In early 1888, Edison's company declared that AC systems were dangerous and generally worse than the DC system patented by Edison.

During the spring of 1888, a series of fatal injuries caused by high-voltage AC wiring suspended from poles stirred up rumours. These accidents were attributed to the greed and

ruthlessness of local lighting companies. In June of the same year, electrician Harold P. Brown started to publicly fight against alternating current. He claimed that AC lighting companies pose a threat to the public by operating high-voltage grids and ignoring safety. Brown's campaign immediately attracted Edison's and his company's interest and help. Edison organized public demonstrations jointly with Brown where various animals, such as an elephant, were killed by alternating electric current. The aim was to prove Brown's assertion that alternating current is more dangerous than direct current. They also argued that an electric chair was constructed as an executioner's tool, and that AC power was thus abused. Documents from this period suggest that there was a secret agreement between Edison's company and Brown. Edison backed Brown in his efforts to put through regulations to regulate AC networks and limit their voltage up to a point where they would become uncompetitive. Edison also provided technical assistance for Brown's tests.

Competition, price undercutting, and legal disputes exhausted the corporate finances of many a company and actually slowed the speed of development of electricity grids in America. At the time, Mr. **Ernst Werner von Siemens** (December 1816 – December 1892) had already been working in Europe with alternating current. Around 1890, the former fifteen major North American power companies merged into three. These were Edison's (hereinafter Edison General Electric), the Thomson-Houston Electric Company, and Westinghouse Electric Company. In the early 1890s, the latter two companies far outclassed Edison's profits. Thomas Edison eventually left the company he had once founded, leaving the electricity business altogether. Edison General Electric started adding AC technology to its portfolio. It finally stopped its war against AC in 1892, when it merged with its biggest competitor, Thomson-Houston, dropping Edison's name from the title. Thomson-Houston executives gained control over the new company. The merger resulted in a group controlling three-quarters of the U.S. electricity market. In 1893, the Westinghouse Company received an offer to supply electricity for the World Fair in Chicago.

Lower distribution costs eventually settled the dispute in favour of AC power, although DC systems persisted throughout the 20th century in some urban areas. DC power is still quite common when it comes to transmitting electricity over short distances and is used in all modern electronic devices. The Westinghouse company still exists today, and it even supplied the entire control system for the Temelín nuclear power plant.

This is bringing us to the first roots of the Pražská kabelovna cable manufacturing company. The business activities, inventions, enterprises and disputes gentlemen Edison and Westinghouse led did not take place separately from the rest of the world, and other more or less important and famous electrical engineers at that time chipped in as well. Westinghouse was very much Europe-oriented and – as already mentioned – he had learned about AC in the British trade press. Back then, he bought the first power generation equipment from the European company Siemens. In addition to having established the hitherto worldwide largest engineering company, Werner von Siemens also built the first electric train. František Křižík constructed the first electric trams and tracks. The Swiss company Oerlikon produced high-end generators and worked on the first long-distance electricity lines. **Nikola Tesla** (July 1865 – January 1943), a physicist, to work for him. The two later parted on bad terms, and Tesla became independent, continuing to conduct business backed by Westinghouse. He mostly promoted alternating current.

An interesting remark confirming that electricity really started to be practically used mainly in the area of long-distance communication is the fact that Thomas Alva Edison first worked as a telegraph operator and that his first inventions were focused on telegraph modifications; the first company founded by Werner von Siemens was called Telegrafen Bau – Anstalt von Siemens & Halske, known as Siemens AG today, and the first thing that made Nikola Tesla famous was his demonstration of wireless communication in 1893. They all began as telegraphists. Another student of the Prague Technical University, František Křižík, and the future founder of the Pražská kabelovna – Emil Kolben – joined this company.



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were very extensive and served also as an
advertising material.

Chapter 3

Emil Kolben

Strančice is a small village on the outskirts of Prague. The St. Anna Chapel is here, where, according to legend, eyesight problems could be treated. Joachim Kolben and his wife Františka (née Freundová) had a small farm and shop in this village in house no. 9, and their relationship was blessed with eight children. Emil was born on 1 November 1862, and he did not stay in Strančice for long, as he was into education, for which he needed to go to Prague. He probably already lived here as a student, and at the beginning of 1888, the residence application recorded by the Prague Police Directorate registered him as a bachelor living in a sublet flat in house no. 1016 at Karolina Světlá Street in the Old Town District. However, his youth soon ended, as Emil was already dating the one year younger Miss Malvína Popperová (*1863), the daughter of merchant Zachariáš Popper, and he married her immediately.

Kolben's brothers also left their home quite soon, and Alfred, with whom Emil worked throughout his life, worked his way up to principal of the industrial school in Brno; Ludvík Kolben hired a farm in Petrovice, becoming the local mayor, and Jindřich Kolben travelled the furthest, moving to the United States, where he managed administration work for the Czech newspaper "Svornost" in Chicago. Daughters Marie, Albína and Kamila remained in the family business in Strančice.



Emil Kolben – Founder of the PRAKAB

Emil Kolben graduated from a Lesser Town school continuing his studies in mechanical engineering and electrical engineering at the German section of the Polytechnic in Prague, from which he graduated with acclaim in 1887. A one-year practice, during which he managed to acquire a Gerstner travel scholarship (the so-called “Gerstner’s talent”, awarded by the provincial committee upon the suggestion of the faculty staff, and an annual amount of 600 Austrian guldens, was mostly to be spent on studies in relation to travelling abroad). Kolben received a two-year scholarship, which literally opened the world up to him. *“I personally had the feeling that this circumstance was one of the decisive moments of my life. I was now able to plan extensive trips around Europe, as well as to the land of unlimited possibilities, the United States of America, the Eldorado of technical development.”* he wrote later.

Vienna became his first destination as the Jubilee Industrial Exhibition was happening there in the Rotunda of the Vienna Prater. All human activity branches were exhibited here, yet Kolben was most attracted to the part focusing on modern electrical devices. From Vienna, he headed to Berlin, where he primarily delved into local industrial areas; then, he went to Zurich, Paris and London, followed by a ten-day cruise on the Red-Star steamer to New York and the United States. The words he mentioned later are frequently cited: *“These were indeed golden times without any passports, visa checks or other restrictions on entry; there were no immigration quotas, customs inspections or residence and work permits. All you needed to enter this promised land was \$ 50.”* He earned this amount back countless times using the experience and skills he gained in America. Kolben certainly wasted no time, travelling to Philadelphia, Pittsburgh, Cleveland, Chicago and Minneapolis, and he managed to do all this in 1888.

When he read in the New York World that the local Edison Works foundry on the Mohawk River in the Schenectady area had burned down, he offered his services and was immediately informed that if he starts at once, he will be accepted. Kolben certainly didn’t think twice, as the name of Thomas Alva Edison already had achieved worldwide acclaim at the time. Edison was the holder of several international awards, he was known for having invented the phonograph and, as we all know, the light bulb made him world famous – by the way, the Mahen Theatre in the Moravian capital of Brno was one of the first buildings in the world (!) to be illuminated with Edison’s light bulbs.

Thomas A. Edison and Nikola Tesla

Needless to say that Edison hadn't been working in Schenectady back then actually, as his headquarters were in West Orange, New Jersey, where his company's heart was located as well. The Czech press even mentioned this place in a similar spirit as it did many years later with Kolben's CKD: *"Any machine can be built in this factory, from a locomotive to a pocket watch."* (Český mechanik (Czech Mechanic), 1888)

Kolben took it step by step, and within a few months he made a career that would have equalled the life-long career of many a person, even befriending the owner. In an interview conducted with "Pražský ilustrovaný zpravodaj" (Prague Illustrated Reporter) in 1929, he said: *"I immediately went to Schenectady, where I was paid \$ 15 a week for working in a design office. I became chief engineer within a year, and at the time I was given the opportunity to consult issues with Edison frequently. He called upon me every time he was working on big issues. I remember him as if it was today. A medium-built, clean-shaven, forty-year-old gentleman. He was always cheerful, he had an expression of youth and a Napoleonic chin. Already at our first meeting when I shook his hand, he told me: 'We will be good enemies. We will love each other only a bit, there will be a lot of ungrateful hard work to do throughout time. But we will always try to be good colleagues.'"*

Edison was a precise workaholic who lived by his idea and was literally obsessed with his work, becoming Kolben's role model and personal friend, who had his portrait hanging in his office until his death. *"It was he who taught me to tenaciously adhere to what was acknowledged as right and that neither effort, care, nor work cannot be spared when carrying out difficult technical tasks."* This is how he remembered him at the end of his life on his fifty-seventh birthday.

It may have seemed that the young engineer was on top of his career in spite of not having become thirty yet. However, he wasn't satisfied with the post he achieved; he felt that there was much more awaiting him. If Edison was the one to have pointed out Kolben's life path, there was at the same time a man who entered his life and changed it entirely. His name was Nikola Tesla. Jindřich Kolben tells us more: *"Tesla allowed my grandfather to participate in tests of three-phase alternating current electric engines, and here the principle of a rotating*

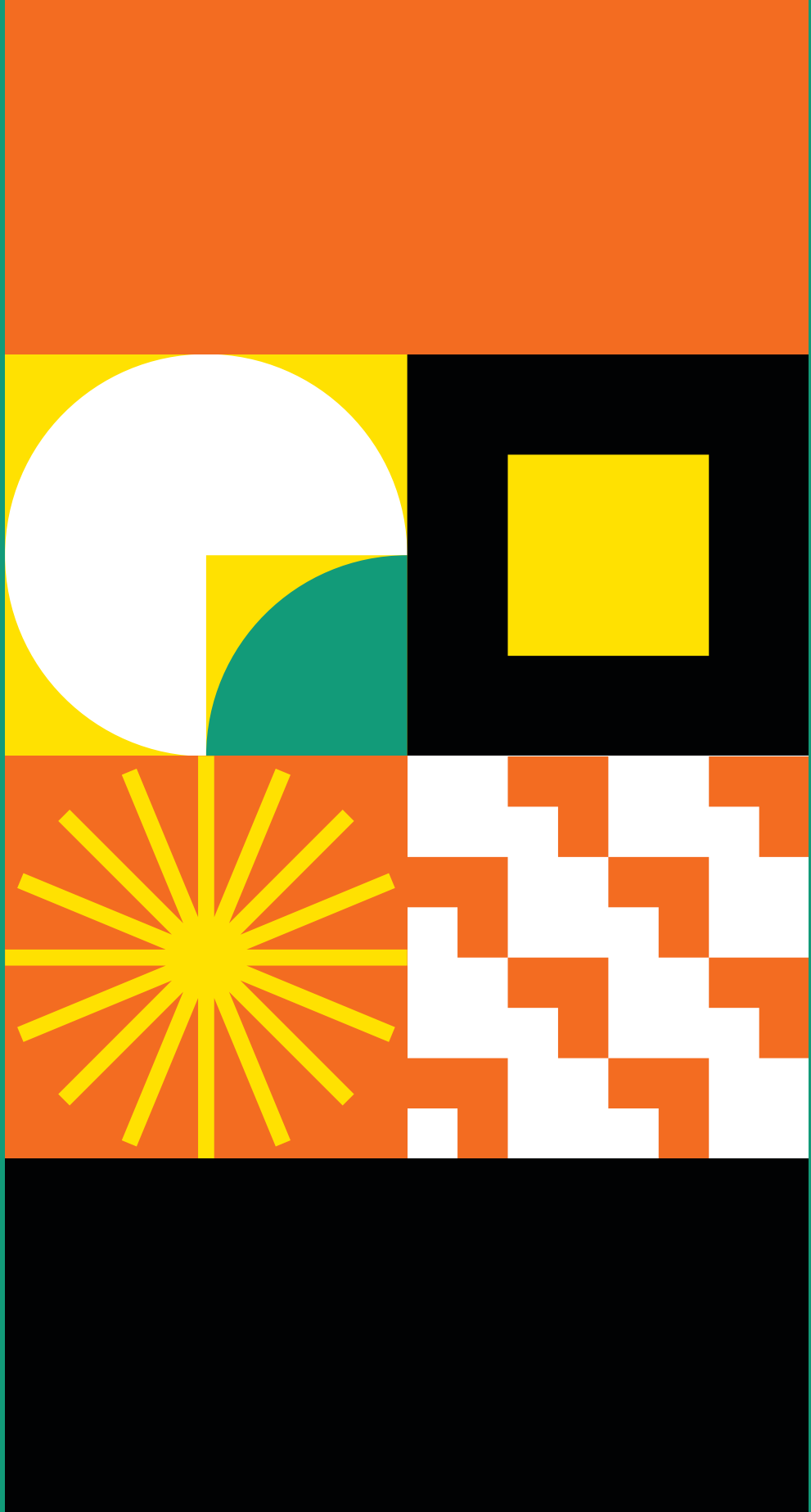
electromagnetic field was applied practically for the first time ever. The tests took place in Tesla-Electric Co.'s New York-based laboratory. This experience contributed to Jindřich Kolben's grandfather's unequivocal focus on alternating current, which formed the basis of his life's work and success."

Kolben discovered that Edison despised alternating current but was keen on using it. This may have caused the two pioneers to break apart, but the reason for the termination of Kolben's employment with the famous inventor was, in the end, a different fact. Much simpler and more personal. Let's not forget that Kolben left Bohemia shortly after his wedding, which meant that Emil and Malvína were spending the most beautiful time of newlyweds thousands of kilometres apart. This is why Malvína finally travelled to the United States to see Emil, and Kolben apparently decided to return to Bohemia because of her and her dissatisfaction with the lifestyle in America. On 3 February 1892, Edison had a big farewell dinner organized for him, and Emil Kolben headed back to Europe. The couple's journey was not straightforward, and they stayed in Switzerland for another four years, where Emil was given the prestigious chief engineer post at the Oerlikon machineries in Zurich. They eventually returned to Prague in 1896 with Malvína (and their one-year-old son Hanuš).

The family settled down in Vysočany, where they moved into the "Flejšnerka" villa, which still stands today (Vysočanská house no. 69), but in 1902 Kolben bought a house with a neo-Gothic tower in Hradešinská Street in the Vinohrady district – house no. 976, the so-called "red villa" (at the time it had a facade made special using rows of red bricks). It was designed by the well-known architect Josef Svoboda, and the Kolben family stayed here until the tragic events of the Second World War. More importantly, however, Emil Kolben immediately set to work eagerly determined to use everything he had learned in the world, and especially from Edison and Tesla. Oerlikon made his reputation great, and his abilities exceeded expectations.

The birth of the foundation of ČKD

Immediately after returning, he founded the new limited partnership company "Kolben a spol." (The main partner being another important Prague entrepreneur from the Jewish community, Karel Bondy). Taking this step and constructing





a small factory hall with one room for twenty-five employees in Vysočany, the foundation of the company was laid, from which the huge ČKD corporation emerged later on. Kolben combined his experience from all the parts of the world he visited, selecting the best and most modern machines as well as procedures, and his company immediately established itself on the market and almost immediately expanded (with great foresight, Kolben bought much larger lots of land than the original modest factory required).

Jindřich Kolben portrays the background and atmosphere of the new company in more details: *“My grandfather was not only the founder, he was also the driver and soul of the company. All building layouts, calculations and constructions of the first three-phase electrical machines were made by him. Being greatly committed himself, a unique working atmosphere and enthusiasm emerged around him. From the three-phase generator in the engine room to the drive of the last machine, all the electrical appliances were produced on site. If three-phase current promotion for industrial use was to become efficient, this technique first had to prove itself at the manufacturer’s production plant itself. Consequently, temporary workshops were first built where the machining tools were driven by a steam locomotive. The required electrical equipment was made here in order to finally equip the later production halls. From today’s perspective it seems unbelievable, but just five months after having purchased the land, the first products were offered for sale, namely three-phase alternators, synchronous engines, induction engines, dynamos and crane drives.”*

It is also quite interesting that in the company’s beginnings, František Janeček, the later founder of the most famous Czechoslovak motorcycle company – Jawa, worked here and practically became an apprentice in here. The strength of Kolben’s company is also evidenced by the fact that after two years, Živnostenská banka showed an interest in it. Kolben merged with the shareholder’s company *Pražská a. s. pro drobné dráhy a elektřinu* (Prague Shareholder’s company for small railways and electricity) and a joint stock company was established known as *Elektrotechnická a.s., dříve Kolben a spol.* (Electrotechnical company a.s., formerly Kolben a spol.), where Živnobanka became the largest shareholder, which meant that the company gained significant strength. We do not intend to go into detail on the development of this company in this book. The company merged with *Českomoravská továrna na stroje* (The Czech-Moravian machine factory) (this company built the Petřín lookout

tower), and finally with *Akciová společnost strojírny, dříve Breitfeld, Daněk a spol.* (Joint-stock engineering plant company, formerly known as Breitfeld, Daněk a spol.), creating the largest electrical engineering company in the country, a renowned industrial colossus known at an international level under the name ČKD (Českomoravská-Kolben-Daněk). We ought to mention that on the way to championing the field of electrical engineering, Kolben even “defeated” his biggest competitor, František Křižík who, just like Edison, imprudently decided to stick to DC at the expense of alternating current. Simplifying their rivalry and legacy a bit harshly and wrapping it into a slightly poetic garb, we might say: whereas the conservative Křižík had a scent of Art Nouveau, arched lamps and a romantically lit Prague, Kolben brought huge machines into motion, and with him came the power of a new industrial revolution that didn’t look back, leaving the 19th century definitely and far behind. It may have also been his love for the old times that caused Křižík’s name to be perceived with greater respect in Bohemia, with more dignity, whereas Kolben’s reputation is huge, yet somewhat neglected by general awareness.

Both industrialists competed with their visions in 1897 for a contract for the machinery of the Holešovice hydroelectric power plant. Kolben eventually won the contract for all the generators with his alternating current concept, which formed the turning point that definitely pushed Kolben forward, while Křižík, who was fifteen years older, slowly began to move away from the industrial sphere. Although the company modernised later will carry his famous name for several decades to come, and even once it takes over Kolben’s company later during the politically escalating era (Křižík and Kolben are still alive then), the founder himself withdraws from industrial leadership ahead of independent Czechoslovakia’s establishment and is no more a visible part of electrotechnical development. Nevertheless, František Křižík never abandoned his opinion, not even when writing his own biography in the early 1930s, where he wrote the following: “*As far as continuous electrification is concerned, three-phase current has achieved a full-scale win, which is why my efforts to carry out continuous electrification with direct current may be considered erroneous and outdated. However, I am pleased to find that the recent period has given me remarkable satisfaction. (...) Thus, I firmly hope that direct current will soon become acclaimed even here.*” He would certainly be pleased to know how many devices used for our daily needs rely on direct current.

But for that we would have to skip quite a few chapters. In 1919, Emil Kolben founded two subsidiaries within his growing industrial empire: *Pražská továrna na izolační trubky* (Prague insulating pipes factory) (later named Tesla Hloubětín) and, of course, what's of utmost interest to us – *Pražská továrna na káble s. r. o.* (Prague cable factory) were.



Emil Kolben (sitting together with his wife) and his immediate family, men standing from the left: pre-war director Ignác Schück-Kolben, his successor Hanuš Kolben and their brother-in-law Vílém Liedler-Kolben

Chapter 4

100th anniversary of Prague Cable Company

Pražská kabelovna is located in Hostivař, a virtually ancient village; we can find references to it in documents as early as the Cosmas Chronicles. In these chronicles, the medieval author describes how the future first Czech King Wroclaw II's armies and his brother Jaromír met here in June 1068. The Přemyslids came to settle their family disputes and, of course, it was all about power and it all threatened to end in a commotion. Back then, Wroclaw bypassed his brother Jaromír who, according to the ancestral agreement, was to succeed on the vacated bishop's throne. The other two brothers, Konrád and Otto, were not happy about their disputes, and they all had their arms at hand at Hostivař. Yet, at the very last moment, the brothers came to an agreement, and there was no battle. Hostivař therefore fortunately did not enter history as a battleground, but as a place of reconciliation.

However, the oldest record in literature does not overlap with the time of the actual settlement: People had been living in Hostivař long before the Přemyslid era; the remains of a fortified settlement on the Kozinec hill date back to the ancient Hallstatt era, around 600 BC. However, this would be going too far back in history for our book, so we'll skip a few centuries; the impulse for establishing our factory here stemmed from a different and quite specific situation.

The first train on the Imperial Franz Josef Railway stopped at the Hostivař railway station on 14 December 1871, and back then, it was indeed just a single-track stop, yet one that soon grew into a small but increasingly dynamically growing railway station. In 1882, when a warehouse building and a special track were built for the purpose of shipping goods, the station was expanded, yet a more significant change took place in 1885, when a second station-internal track was built to provide for trains crossing each other's ways. This significantly simplified the unloading and loading of goods. At first, there was just a guard house (house no. 102 standing next to the footbridge leading over the tracks), and in 1905, in the course of gradually double-tracking the line between the Královské Vinohrady city district and Benešov, a new station building was built (which is now no longer in service) and station tracks no. four and five were laid.

This is actually where one of the gates to our story opens up. Hostivař had been an agricultural village for many centuries, but it suddenly opened up to industry. The flat terrain to the north of the track towards Štěrboholy provided almost ideal conditions for constructing factories with facilities, including the required sidings – short rail tracks connecting industrial enterprises to the

main railway. There was also an apparent trifle, which, however, significantly simplified the transport of production materials to factories and finished products to customers. The Hostivař railway station was also the first beyond the outskirts of Prague in the direction of Vienna, and it therefore represented a very strategic business hub.

Hostivař industry

The factories in this district started growing fast; the first emerged at the end of the Austro-Hungarian monarchy era and during the early days of the young Czechoslovak Republic. Some of these enterprises shot up like a shooting star for a moment, only to fade out again, like Pražské sklárny (Prague Glassworks) or Mlýny a pekárny Host (Hostivař Mills and Bakeries), while others finally became big players internationally. The latter include Otakar Podhajský's engineering works (constructor of the air conditioning system in the tomb of Czech kings in Hradčany), the paint factory of František Josef Materna (later named "Barvy Laky", i.e. Paints and Varnishes), and the shoe company František Štěpánek, former mayor of Zlín and close associate of the great shoemaker family of Antonín and Tomáš Baťová. There were all industrial branches at Hostivař – wood and metals were processed here, paper products, shoe creams, bookbinding machines, scales and surgical silk, medicines and confectionery were produced here. Brushes were made here by Václav Schmidt, the father of the Czech author Eduard Bass, the modern Karas wine bar was built near the Hostivař railway station with large cellars cut into rock, from which the wine travelled all the way up the Russian Tsar Nicholas. The bankrupt mills were soon replaced by modern film studios, a tobacco plant replaced the fruit drying facility, and there was also a concrete plant, an electric saw, the Káš & Werner factory for narrow-gauge railways and machine tools, and later the world-famous Jiří Kameníček machine tools were built here.

Industrial life led new inhabitants to Hostivař, infrastructure flourished, new houses were built, and in the early 1920s, the village was annexed to Greater Prague. It was a time when the first Czechoslovak President Tomáš Garrigue Masaryk came here from time to time to lead friendly debates with Prime Minister and Hostivař patriot Antonín Švehla, and in order not to embarrass the locals, they had the roads repaired, refurbished the centre of

the old Hostivař housing development, and began to solve the sewerage problem (sewage water had been led into the Botič brook continuing into the Vltava) as well as better source of drinking water. Within just a few years, the formerly inconspicuous village that tourists from Prague had only visited for their Sunday trips into nature or to dance at the local inns, had new blood flowing through its veins in an unprecedented manner.



Early 1920s and the still lonely factory in the fields of Hostivař

The many hitherto listed industries included the first modest and rather small cableworks *Pražská továrna na káble*, which was the only one that didn't fit into the chessboard shape-arranged new factories, as it was at about a 45° angle. The reason for this was a supposed building plan, where several factories were to be built at the same angle to the north-east, but it was eventually abandoned and today it is only commemorated by the cable factory itself.

Emil Kolben had it built here, but the first chapters of its history began in Austria exactly thirty years earlier. We first have to add another core to our cable.

Watchmaker Steiner heads for Schwechat



The grandfather of the PRAKAB Cable Company, Otto Steiner

Otto Steiner was born in 1856 in Karlín, which was still a Prague suburb back then. His father was the merchant Wolf Steiner (*1811) from the central Bohemian town of Roudnice nad Labem; his mother Terezie, née Lagusová (*1820), was from Libeň. Their shop was probably located on Na Poříčí Street, where they also had been living for many years. Little Otto had three older sisters, Berta, Klára and Johanna. They were all Jewish, but Otto left the Jewish community himself and remained without religion. We do not know when he left Prague and went to Austria to seek his fortune, but in 1890 his trace reappears in Karlštejn, but not in the Czech medieval monarch royal residence, but in the town of Karlstein an der Thaya, in the Archduchy of Lower Austria. Steiner slowly advanced into the electrical engineering industrial world, opening an alarm clocks and pendulum clocks production factory in Karlstein, which was a well-known Austrian watch industrial centre at the time, providing simple, affordable and aesthetically pleasing clocks in large series. Although he seemed to have found his occupational path in life, the opposite was true, as the young watchmaker was increasingly attracted to the modern world of

electricity. *“Time can be measured, yet not controlled,”* Steiner wrote. *“However, targetedly transmitting energy via cables gives society and every individual unlimited possibilities. I want to be part of this development.”*

And so in 1891, he founded a new factory in Schwechat near Vienna, this time for electric cables. He bought the dilapidated building, which consisted of a mechanical spinning mill and a mill (Pappelmühle), and decided to erect an entirely modern factory in here.

Schwechat or “Švechat” as it is called in Czech, is probably best known today as an air traffic junction and a place with one of the largest European oil refineries, and it certainly wasn’t unknown to the Czechs during the 19th century. This town located close to the Austrian capital made history with a great battle to thwart the Hungarian revolutionary ideas on October 30, 1848. There was also a large Czech minority living here, which made Schwechat occasionally visible during the times of national strife at the end of the Habsburg monarchy, with minor quarrels between Czechs and Austrians. However, these times were long, long ago, and back then Schwechat was better known as a distributor of first-class iron and great beer. The local brewery, which was world-famous once, was the largest in the entire empire.

And it was here that Otto Steiner decided to build a cable factory. From the beginning, he had a clear idea in his mind; the materials for the transmission of electricity would not only become his job, the factory itself would be an electricity exhibition hall, which will fully serve it. The authorities demanded many permit conditions to be fulfilled, so the retrained watchmaker had to overcome many difficulties prior to collecting all the necessary stamps, and in July 1892 he was finally able to build his dream – *Otto Steiner’s cable and rubber products factory*. His business’ beginnings were set on paper by the current owners of the company, Dr. Christoph Tremmel a Mag. Alexander Tremmel, together with their editorial team in a publication called orig.: *Kraft der Verbindungen*, i.e. *The Power of Connections*, from which we can now cite several passages in the following sections:

“Due to the installation of a vulcanization boiler, which was necessary to make rubber compounds in an overpressure of three atmospheres, the floor in the boiler room had to be tiled. All workrooms had to be vented. It is surprising that even back then, great attention was paid to the workers’ safety. We can read in the building permit that in order to avoid the risk of tripping, the floors in all rooms need to be ‘significantly refurbished’.

Additionally, any and all rotating parts or protruding components of machines need to be 'adequately secured'. Even the distance between machines was precisely determined, with the minimum width being one and a half meters. "

Constructing the factory took several years, and full-scale operation started at the turn of 1896. The first brochures offering goods were also been preserved. *Gutta-percha and rubberised, telegraph and lead cables factory*, as it had been advertised back then. The company's first work rules date back to this period, which are again presented in the publication *The Power of Connections*:

"Every employee had to be at least fourteen years old, and on each day, ten working hours were scheduled from 7:00 a.m. to 12:00 noon and from 1:00 p.m. to 6:00 p.m. Workers were required to work for pay, or they had to be paid according to piecework and fines – such as those for late arrival – were paid into the general workers' medical and accident insurance system. Women and adolescents were forbidden to work before 5:00 a.m. and after 8:00 p.m. Occupational groups were also strictly regulated. Mechanics, locksmiths, machinists, lathe workers, carpenters, blacksmiths, winders and various auxiliary workers employed here. The latter were even given the option, albeit as unpaid leave, to attend evening or Sunday schools."

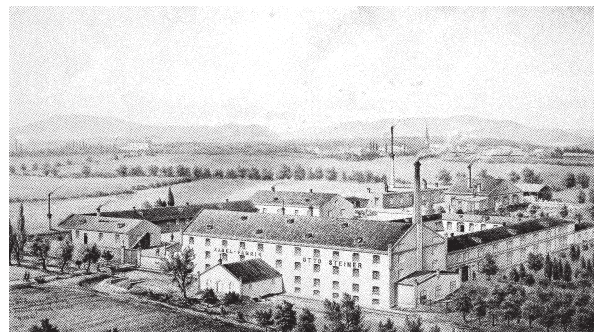
A Prague-based competitor

The company had a promising start and received its first orders; the plant was divided into five departments and a contemporary advertisement also lists the assortment provided by Steiner's factory, as everything was performed here – from pulling wires to finished low-voltage or high-voltage cables. Hard, medium and fine copper wires were prepared in a specialized department in charge of producing this type. The next section had tinned and galvanized copper, bronze, steel and iron wires prepared, as well as bare wires for light and telegraph lines. The rubber factory produced hard and soft rubber or gutta-percha for wrapping braided wires with insulating mixtures, while yet another department served as a bobbin facility, where the products were packed into textile materials. The company was recruiting increasing numbers of workers, and in 1900 a total of 110 employees were involved in the production and sale of

cables, while the company kept on expanding its facilities and the influence it had throughout the monarchy. It set up branches not only in Vienna, but also in Budapest and Prague.

As early as October 1899, the *Národní Politika* (*National Politics*) paper said that Otto Steiner would like to employ apprentices at his office and warehouse in his branch at Havlíčkovo náměstí (the city square currently known under the name of Senovážné) no. 17. The Commercial Register enlisted Steiner's sample warehouse for the products of the "Schwechat cable factory" in Prague in July 1901, and Bedřich Roubíček (Friedrich Robitschek) became the company's representative. The company later moved to Krakovská Street no. 25.

Steiner already had some competitors here, although not very big and Prague often called to Germany or Austria regarding exceptional contracts, so Otto Bondy's Vienna-based company (who was, among others, the founder of the later Kablo Bratislava group) won the contract to build the Smíchov lighting project (starting in 1896). At the time, *První česká továrna na opředený drát a kable Köppel & Seiboth* (*First Czech Braided Wire and Cable Factory Köppel & Seiboth*) was based on Mariánská Street (today's Opletalova Street), while *Josef Prokop, vdova a synové* (*Josef Prokop, Widow and sons*) focused on electrotechnical assortment production; *Würl a spol.* had an electrical engineering plant in the Vinohrady district and, of course, we cannot forget the leading Prague cable company, namely the František Křižík factory in Karlín. Many goods were being imported from abroad, especially from Germany, which the Czech press didn't forget to mention, as the nationalist newspaper *Grégrovry národní listy* criticised this problem in 1911, accusing the Czech electrotechnical companies of focussing so much on petty brawls led between them, which was

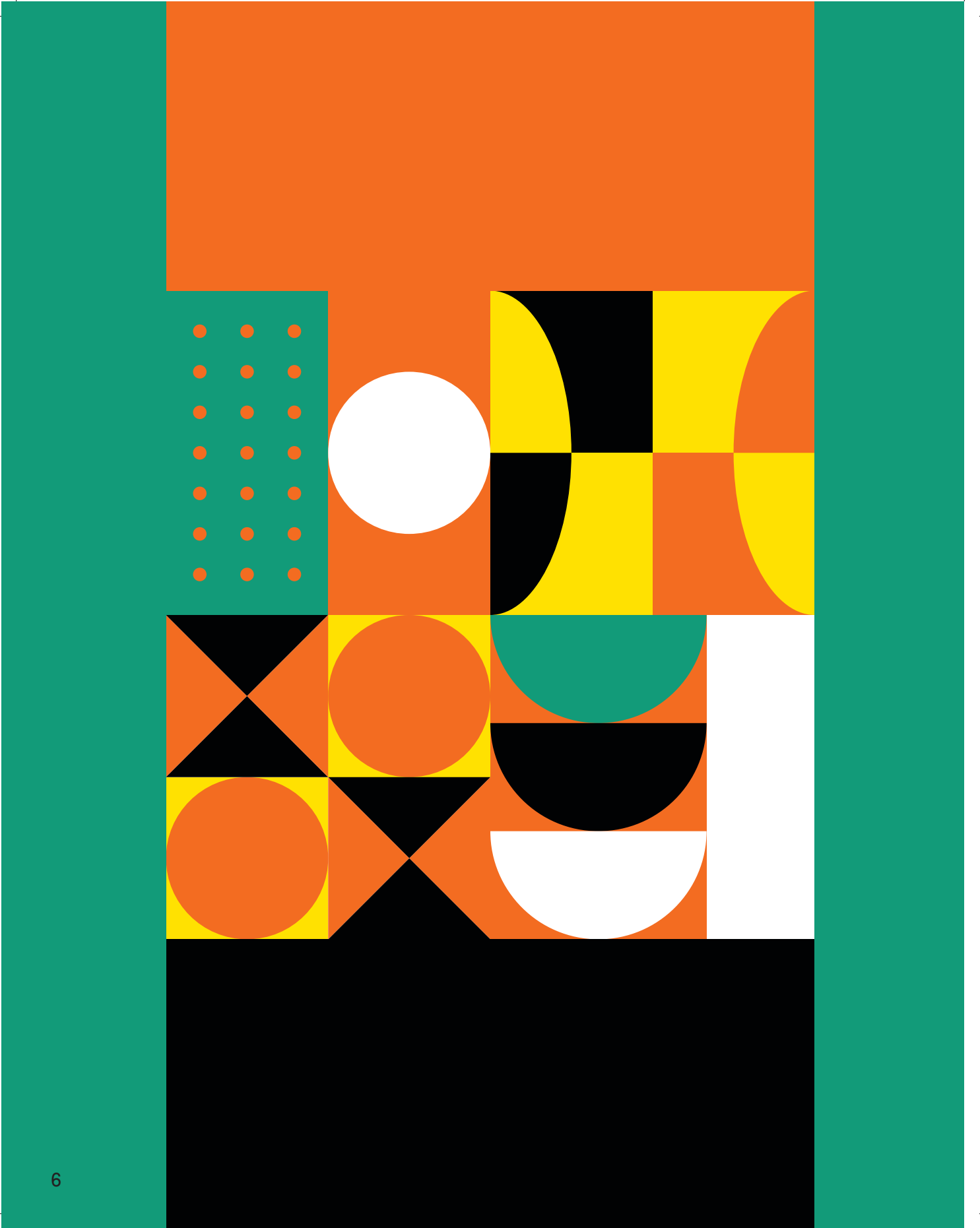


Otto Steiner expanded the small factory from 1891 into the Otto Steiner Cable Factory (orig. Kabelfabrik Otto Steiner)

something to laugh at for the big German companies: *“Since there are no Czech companies manufacturing corresponding products, the Czech electrical engineering plants situation is furthermore hampered by the fact that they have to draw an entire range of materials they require such as: underground cables, bare or rubber-insulated wires, light bulbs, etc., from cartel German companies. Given the horrifyingly high yields, such as those achieved in the sale of armoured cables, where importing cables from abroad becomes virtually impossible as a result of high taxes and the expensive transport itself, selling goods to German companies may generate no profit in cases where one requires another item that is currently being offered, such as dynamos, appliances etc., and this makes competition in Bohemia virtually impossible.”* (14 September 1911).

Although the author of the above-mentioned words (an engineer hiding behind the letters K.V.) would probably, hand in hand with large German companies, condemn Otto Steiner’s enterprise as well, the situation didn’t turn out that bad. Soon, Emil Kolben noticed the vacancy on the market and started cooperating with Austrian entrepreneurs vividly.





Heinrich Eger's entry

The Schwechat cable company made a successful start, and Steiner opened branches in all Austro-Hungarian monarchy capitals, exporting products into the wide world and offering special-needs cables for dry or humid rooms with different conductor diameters; he also provided a wide range of insulated cables, pointing out their higher safety compared to previous cables. Electricity began to gain increasing attention and became the subject of interest of many entrepreneurs as well; on the one hand, trade was growing successfully, on the other hand, it was increasingly difficult to keep up the pace with major competitive requirements. After several years, Otto Steiner, who did not intend to join a cartel or merge with a stronger company as far as capital is concerned, slipped into a crisis as well. Even the vast dowry of his wife, Henrietta Eger, who brought the huge amount of 40,000 crowns into the family with their marriage in 1897, was unable to save him (this sum equalled the amount for which one could buy up to four houses in Vienna; a skilled worker in Austria earned about 50 crowns a month). After several attempts to revive the company or gain additional income (by leasing parts of the factory), Steiner fell into larger and larger debts. By the end of 1903, the situation had become unbearable and the merchant was inevitably facing



Married couple Otto and Henriette Steiner, 1897



Heinrich Eger

bankruptcy, so he both ceased paying out wages and stopped production. At this time, the company's liabilities reached about 500,000 crowns. Thankfully, his rich father-in-law stepped in.

Heinrich Eger is another of Prague's Jewish merchants who left a significant footprint on the path towards establishing the future PRAKAB. He was the son of Löwi Jakob Eger (*1811) and his wife Anna (*1813, née Brandeis), and he was their first descendant, born on 2 May 1839 in Prague. Like Heinrich's future son-in-law Steiner, Eger went to Vienna, leaving Prague around 1867. A very successful career lied ahead of him in the production of iron and cast-iron products (e.g. sewing machine frames). His business performed so well that he soon became one of the most successful local manufacturers making further investments in other business sectors. He probably couldn't resist entering Steiner's enterprise, and though he came to entirely control it over the following years (1906). He initially kept its original name in order to protect his son-in-law's name as well as social status (as written in the notarial deed). Despite this noble approach, he eventually renamed the company due to more tragic reasons – Otto Steiner fell seriously ill at the age of only 51 and died on 11 September 1907, leaving behind a widow, Henrietta, and the two children, Kurt and Erna. The father-in-law thus took over the custody of both children along with the factory. Shortly before his death, Steiner had his company removed from the Commercial Register so that it appeared years under the new owner's name, i.e. the *Schwechat Cable and Rubber Plant Heinrich Eger & Co.*



Heinrich Eger and his family

Kolben and Schwechat

Emil Kolben hitherto had a colourful life as well. In 1908, he first met the emperor himself, which happened twice more until prior to the monarchy collapsing. This was an honour demonstrating more than clearly how the monarchy valued the industrialist. Francis Joseph I awarded Kolben the Order of the Iron Crown for his services in preparing the Prague Jubilee Exhibition of the Chamber of Commerce and Trade in 1908, which had already been visited by about two million people. *“The emperor seemed very forthcoming to me,”* he wrote from Vienna to his wife Malvína. *“He looked great, had a smooth face and a fresh look. To sum it up, it was a very nice, historically significant experience for me.”* At the time, he had no idea that he would later meet his successor and also the last Czech king, Charles I.

Kolben then welcomed his American friend, Thomas Alva Edison, in Prague, naturally guiding him personally through the ancient city. Throughout its existence, Edisonka Café on Prague’s central Wenceslas Square, where Kolben took Edison, boasted that this famous couple drank their coffee here, with Edison’s framed thank-you note above the table at which they sat.

However, Kolben only seldom rested and was already looking for other ways to use electricity. One thing he got from his teacher Edison was the desire to discover. On 9 July 1897, he obtained a patent for a device to start single-phase AC motors. He designed a multipole dynamo for direct connection to steam engines and developed a perfect electric railway engine design, while also embarking on experiments in an unexplored area, namely “electroculture”, i.e. the use of electricity in agriculture, especially in growing vegetables. This was a subject that attracted the attention of many visionaries for a short time.

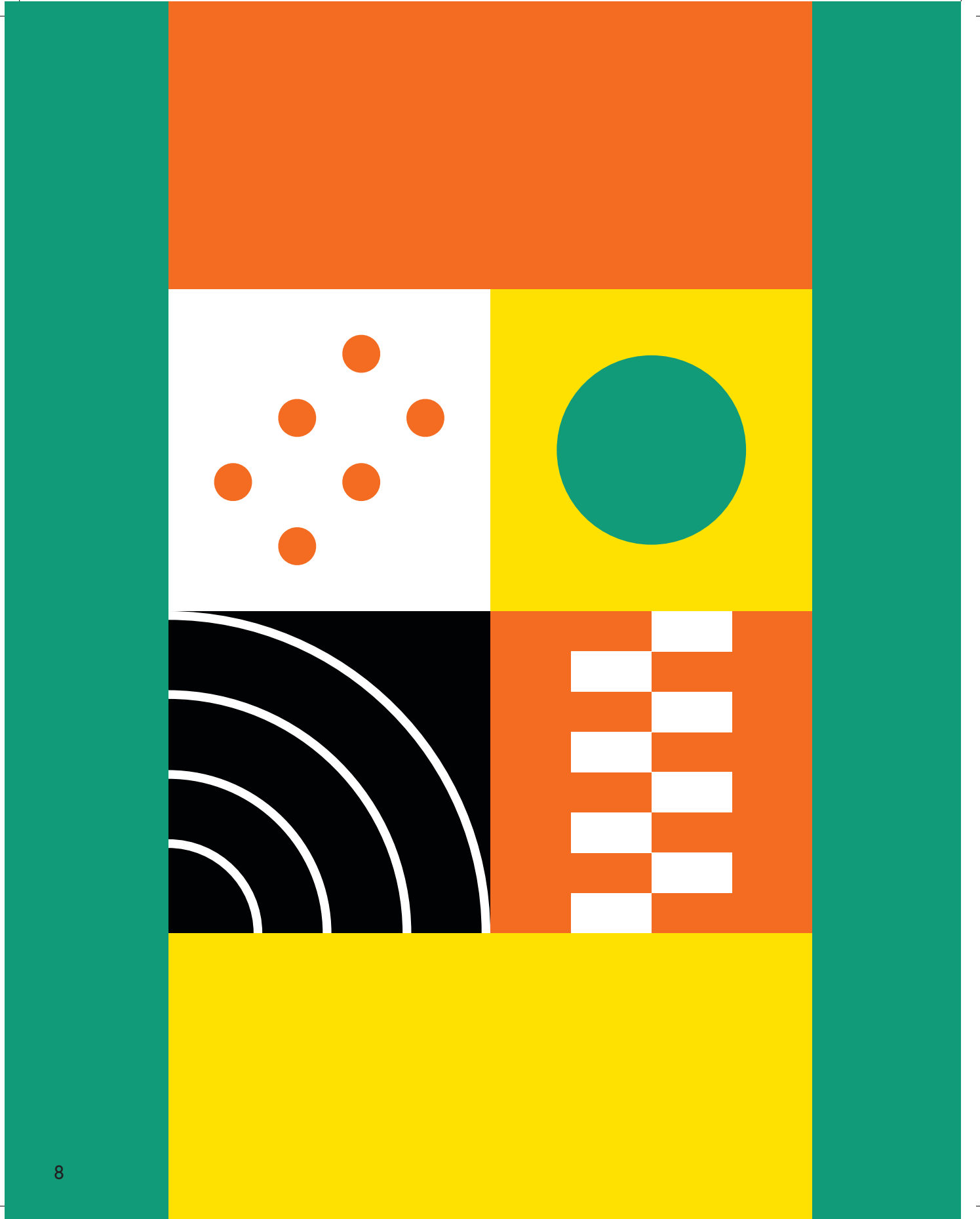
As we have already mentioned, Emil’s brother Ludvík had been renting a large estate in Petrovice, and it was here that these two brothers delved into trials to link electricity to agriculture. This electroculture focused on two issues: irradiating plants with artificial light and the effect of electricity in direct contact with plants. Scientists – as well as the Kolben brothers – were trying to spread a powered grid over a vegetable bed while observing the effects this would have on plant growth. The Kolbens tried working with high voltage on an area of 70 ha. The Czech agrarian newspaper *Venkov (Countryside)* wrote about their experiments on 3 December 1911: *“These experiments were conducted under*

the control of the Academy of Business in Tábor and, despite the unfavourable, dry summer, they achieved 50% higher yields of wheat, almost 100% higher yields of oats, and 30% higher yields of sugar beet.” Nevertheless, the results were probably not as satisfying as the article describes, as the Kolben brothers soon stopped them and Kolben decided to expand his activities to areas he was more confident with.

We are not sure whether Emil Kolben bought cables from Otto Steiner, but it seems quite probable; there weren't many companies in Prague offering this product range, so Kolben needed to buy them, and future events suggest this. Nevertheless, we certainly know that Kolben had already been conducting business with Heinrich Eger, and their cooperation proved so mutually beneficial and satisfying that the two men soon became personal friends. Shortly before the war, their business relations deepened considerably, and when Eger decided to modernize the factory, he not only invited Emil Kolben, he also offered him a 40% share in the company. On 23 August 23 1912, the company's modified status was noted in the Commercial Register. Additionally, Eger freed his hands, metaphorically speaking, appointing the Prague engineer as the company's second CEO, demonstrating such high confidence in him that despite his majority share, he even gave him equal voting rights regarding the company's decisions. Along with the changes, the company altered its name, now presenting itself as *Schwechat cableworks Ltd.* (orig.: *Schwechater Kabelwerke Gesellschaft mbH*), and the abbreviation has remained in use to this day. The registered capital was 500,000 crowns, and apart from Eger and Kolben, Robert Eger (Heinrich's son) and Kolben's confidant Hugo Freund were in charge of the company's management.

Even the Prague press wrote about this change, remarking that the factory was preparing a plant extension worth one million crowns and to make new cables in a lead sheath factory. Everything seemed good; the four-member management proved its worth, the Schwechat factory was also modernized thanks to the help provided by products from Kolben's Prague company, and after its revival, the company came alive again. Emil Kolben was certainly very pleased, although he buried his Father Joachim in November of the very same year. Nevertheless, difficult times awaited the whole of Europe, as the tension between nations escalated in 1912, and very soon everything was to change dramatically as the world headed for the first great catastrophe of the 20th century.





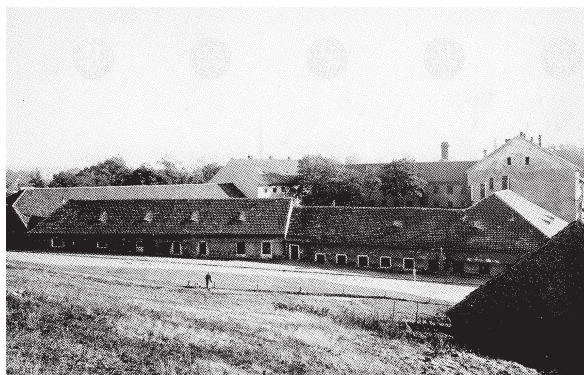
The monarchy disintegrates and PRAKAB is established

On 28 July 1914, the First World War broke out, affecting everyone. The Schwechat cableworks had to contribute to the armament efforts providing war loans, but that was not the worst thing. At first, it lost its general director Heinrich Eger, who died on 6 September 1915, and his son Robert, who had to enlist (he later fell into Russian captivity, from which he only returned after the war), became the new director. The cable company's management was suddenly narrowed down; Kolben himself was fully occupied with his business, which is why the management was at first temporarily, but later for many years, taken over by the fourth partner Hugo Freund.

The war also fundamentally rewrote the Europe's topography, complicating trade between individual nations in Austria-Hungary. With battles coming to an end, not only the monarchy was torn apart, but also many trade relations that had hitherto still worked within the single empire. However, Kolben always considered national disputes to be secondary. In 1924, he wrote, *"The goal of a nation or group of nations united as one country is the individual freedom of citizens, meaning that every citizen can live according to the self-determination principle and being fully aware of his or her own responsibility."* Furthermore, globetrotter Kolben had been brought up in the Czech town of Strančice, yet he spoke German at home, which is why German was more his mother tongue than Czech. It was never of any importance to him whether an expert he needed in the company was Czech, Austrian or German (after all, he himself worked for many years as a foreigner abroad, both in the USA and Switzerland). Nevertheless, many patriots didn't like this approach even after Czechoslovakia became independent, and this opinion became stronger as Hitler's Germany became increasingly aggressive. Emil Kolben was criticized many times for cooperating with his German and Austrian colleagues, and he soon felt this himself when he was forced to resign from the post of chief director in Elektrotechnická, the company he had founded himself. This was probably only because people believed it was too closely connected to supporting the Habsburg war efforts, and there had to be a "scapegoat". The Kolbens additionally declared themselves a part of the German population (Emil's grandson Gerhard, a Prague-born RAF pilot, stated after many years that he is of Austrian origin). Although

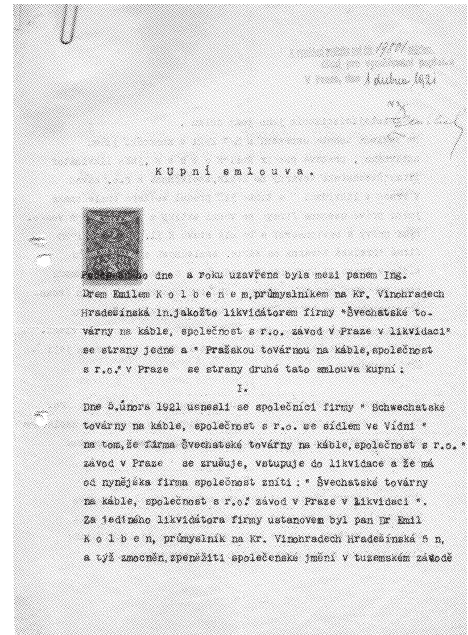
Kolben was allowed to stay at Elektrotechnická as an Administrative Board member, this unpleasant and significantly humiliating situation probably contributed to the fact that ČKD was built later, where he became director again (managing electrical engineering director), as well as the decision to establish two new companies with backed-up management in the form of family members. This was the already mentioned insulation tube factory, but mostly Prague cableworks Pražská továrna na káble, i.e. PRAKAB.

After the extensive introduction, this brings us *in medias res*.



Two views of the background of the first Prague cable factory, the old brewery in Vysočany (photo: Prague City Archives)

PRAKAB's basis originated from the Schwechat cable factory branch, established in Prague – Vysočany in the autumn of 1919. Its capital reached 500,000 crowns; Kolben and his colleague Oldřich Harfel became executives. At first, it was based in Vysočany, like Kolben's home, not far from "Kolbenka" in the old brewery. It was founded in the 19th century, originally belonging to the Dominicans, and its golden era was at the beginning of the twentieth century when it was first being rented and then owned by brewer Karel Spurný, when local beer and landscaped gardens with a pond attracted many tourists. In 1914, however, beer production ended and a new tenant was needed for these premises. During a short post-war period, a branch of the Schwechat cable factory taken over by Kolben moved in here, and instead of hop juice, electrical wires were produced here. However, it was soon discovered that the brewery's premises were not suitable for an electrotechnical company (today there is a modern hotel with a restaurant here), and before Kolben looked for a new space, he decided to take two steps: build a new factory and establish a new cable company.



E. Kolben buys the Prague branch of the Schwechat cable company, 1921

This resulted in a contract on 8 July 1920, and a new company was established on 7 January 1921 by registering *Pražská továrna na káble s. r. o.* (*Prague Cableworks*), which bought the current SKW Vysočany branch (it also agreed to pay annual license fees to Schwechat). Emil Kolben figured in it as the founder, managing director and majority shareholder, while the engineer's collaborators from Austria also remained the owners: Initially, Kolben owned 36%, Robert Eger and his brother Alfred owned 18% each, Hugo Freund 10%, Henriette Steiner, i.e. the SKW-founder's widow, owned 9%, and her sister Gisela Wiese owned 9% as well (it is not without interest that the ownership in the Schwechat cable company was divided very similarly). Kolben's colleague Oldřich Harfel and his son-in-law Ignác Schück became confidential clerks. The share proportions reveal that although the company was based in Prague, most of it was still owned by Austrian traders.

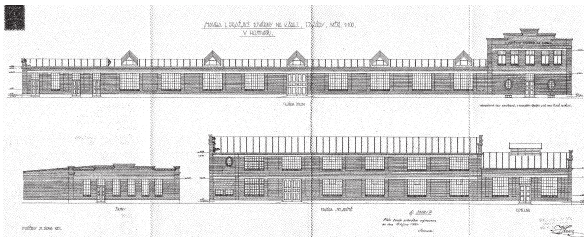
In December 1921, these partners were even joined by Antonín Švehla's brother in law, a Hostivař-based miller and a very active businessman, Karel Krečmer. Emil Kolben ceded part of his share worth 40,000 crowns to him, which was probably in exchange for him selling a plot as the factory was to be built

on agricultural land owned by Krečmer with cadastral number 650 (bordering the Dolní Měcholupy cadastral area) north of the already operating railway companies. Later on, Krečmer, who was also interested in establishing further Hostivař factories (such as glassworks or mills with bakeries), fell into financial problems after some of the companies he co-owned had disintegrated, and he sold his share back to Kolben in October 1924.

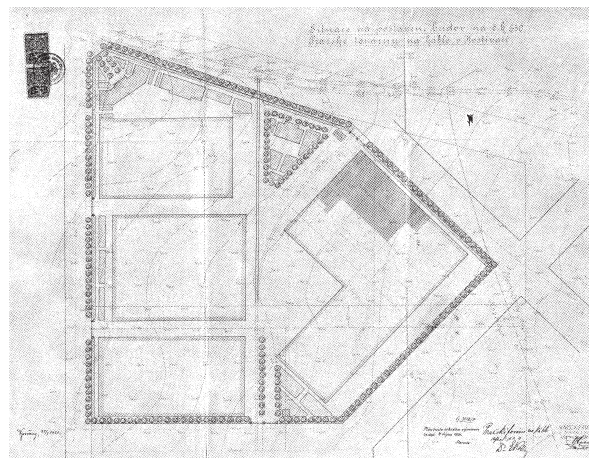
The company's activities were limited to producing cables and other electrical conductive material, also including "objects pertaining to the given subject". The company's capital amounted to 400,000 crowns, and it doubled in 1923 (another five years later it was 3,600,000). The headquarters of the company labelled with the acronym PRAKAB (PRAžské KÁBLE) was at Vrchlického sady no. 1 (today's Washingtonova Street) in a corner building near Wenceslas Square, which was later destroyed during the liberation of Prague at the end of World War II.



The oldest known image of the factory with the main hall still standing, approx. 1922



Plans of the main factory building by architect Václav Haas, 1921



Situation plan – Prague Cable Factory, 1921

At the turn of 1921, Kolben had the foundation of a factory including the main building, which is still standing, built on the said Hostivař plot. The ground floor building with a two-storey administrative section was designed and built by the Vysočany-based architect and builder Václav Haase, with whom Kolben successfully collaborated on his other factory buildings as well (Haase is, among other things, the author of the Vysočany Municipal Hall). The steel frame was bricked up and the builder opted for lime-sand bricks from the Komořany area near Prague (according to the original plans, the impair ones at the window ledges were painted black).

In March 1922, the most difficult construction work had already been completed and the company asked the municipal authority to have the access road repaired (i.e. today's Ke Kablu Street and the adjoining Rabakovská Street as today's Průmyslová artery did not yet exist). On 16 June the new buildings were assigned house no. 278, and on 25 June the buildings were successfully approved; during June and July of 1922, workers were already moving all the equipment from Vysočany to this place.

On 19 July 1922, the production of wires and cables began in Hostivař.

The first generation



Advertisement, 1926

The founder's son-in-law, Ignác Schück, i.e. the company's confidential clerk we have already mentioned, became head of the factory. He came from southern Bohemia and he was born 12 February 1889 in Zadní Střítěž near the South Bohemian town of

Tábor. He married Grete Kolben, later adding his wife's last name to his own. At a time still conservatively patriarchal, this was truly unseen, demonstrating the respect that Kolben's family enjoyed in society (Vilém Liedner, husband of Greta's sister Lily and head of Kolben's second insulation tube factory took the same step). Ignác's father Julius also worked for PRAKAB and, according to the company's documents that were submitted to the tax office, he provided "confidential information, especially about the credit ratings and creditworthiness of customers."

František Buk, the later administrator of the entire Hostivař facility, became the dispatching clerk, Jan Slavík became the accountant, engineer Hahn in turn became the designer and calculator, whereas Ing. Jan Hrdlička, who later supported the company as well as its director, was named technical director. Mr. Sattaler, the production manager from Schwechat, and his two sons who were employed in the workshops, came here from the Schwechat cable company. The factory initially managed to cope with less equipment: one laying machine, two wire drawing machines to provide for a smaller wire diameter, a spraying machine, a vulcanizing boiler for three drums, baths for dyeing wires, two braiding machines, four winding machines and two stranding machines. Back then, the rubber compounds were not yet produced directly in the plant, they were brought in from the Libeň-based Köppel cable company and then manually cut. The so-called "pre-drawn" products for copper wires from the Kovohutě Povrly metallurgical plant were also purchased and processed on site. However, the number of machines gradually increased as the company expanded its operation. The factory started making rubber compounds in 1923, and it also bought a horizontal lead press for pressing lead plates; the boiler room was also equipped with a second boiler. The company had a transformer station, its own coal depot, garages, petrol storage facilities and two further depots built, all approved on Christmas 24 December 1923.

PRAKAB was also immediately linked to the nearby Hostivař railway station via a siding (the frequently listed year of connection 1930 is wrong, and we cannot even rule out that the siding itself preceded the establishment of the factory and served to transport construction material on site). It was connected to the tracks leading to the company's industrial neighbours located to the South, i.e. glassworks and bakeries.

The company produced and supplied both low and high-voltage insulated conductors of all kinds, cotton and silk insulated copper dynamo wires in small quantities, conductors for

telephones and telegraphs, bare copper wires and ropes, swelling tape and insulating tubes. *“Although the company was labelled a cable factory according to its name, its production programme increasingly resembled a conductor factory,”* wrote Emil Buchlovský, the director at the time, in a brochure issued on the 50th anniversary of the company’s establishment. *“A fundamental change in this relation happened in 1929, when the machine park was expanded with a vertical Hydraulik, a Duisburg lead press with a 700 kg load capacity. The lead smelter and the press head were diesel-heated. A building with the required height and a total area of 300 sqm needed to be built for the new lead press.”*



New boiler installation

Václav Assmann, a long-term employee who worked in the company from the very beginning, gave us a glimpse into another production aspect at the time: *“Furthermore, a round coal-heated annealing furnace was built in the boiler room. A massive cast pot, about 130 cm high with a 60 cm diameter, was lowered into this furnace by a hoist, with copper wire inserted into it, each placed in a tin box closed with a lid, and the gaps between the boxes were sand-filled. The sand-filled pot was first closed with a copper lid, smeared with clay, and covered with a second massive lid, which was smeared with clay as well, and after being put into the furnace, the furnace was closed with an integrated*

fireclay cover. The annealing process started upon reaching a temperature of 400–450 °C and ran for six hours. This was a very lengthy and laborious procedure. The annealed wire materials were not entirely clean, as the air tapped within the pot oxidized the wire. The annealing process ran two to three times a week.“ Assman further adds the following about the rubber production beginnings in 1923: “One mixing calender to produce rubber compounds and one two-cylinder drawing calender were built. The blend production volume was 36 kg, with 50% consisting of rubber, which was gradually skimmed off. Mr. Vrbata was the first rubber maker, and the beginning of production naturally experienced some hiccups. More than just one mixture-or “mišunk”, as the locals called it, ended up in the dump.”



Chimney construction during World War II

At first, Assmann worked as a stoker, but he made his career at the plant working his way up to the post of technical manager. The boiler room was initially equipped with a Cornwall two-flame boiler with a 40 sqm heating area. The seventeen-meter high chimney stood in the right corner, and in 1926 it was extended by another four meters. “It’s worth mentioning here that during the winter months I had to cart in up to 125 quintal of coal from

the yard, bring away the slag and ash out, and yet manage boiler room maintenance and frequently carry out installation work in the company,” recalled Assmann on the occasion of the fortieth production anniversary. “It was truly satisfying when the revision inspector in charge of testing steam boilers and machines said our company’s boiler room could serve as an example for the entire Prague region, and when Dr. Kolben occasionally visited the plant, he didn’t forget to pay a visit to the boiler room, where he just nodded to prove he was satisfied.” The economically functioning system made the boiler drive steam not only into the machines, but also into the heating system in the occupied rooms, and the condensate was led back to the boiler room tank.

The lines mentioned above reveal that one of the things Emil Kolben stuck to at his plants was cleanliness. That’s why chief electrician Kraus and his assistant took hold of the brooms once a week and, after stopping the machines, simply swept dust and cobwebs away from all the machines, blew dirt from all the engines using bellows and, if necessary, lubricated the machines.

PRAKAB introduces itself

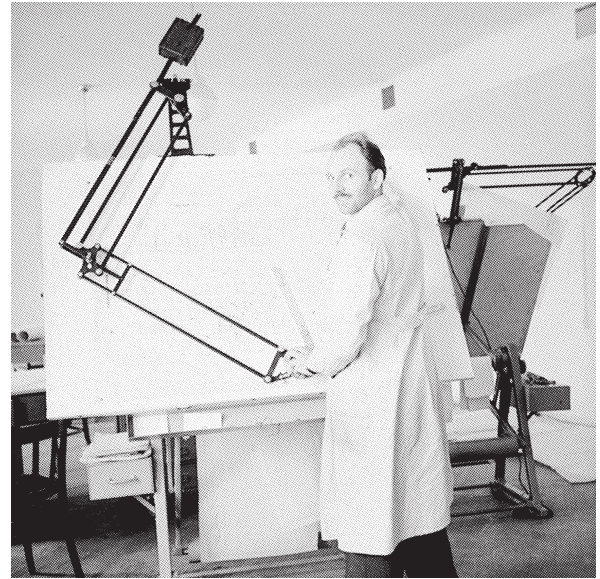


Workers in the hall, 1921

In the very first years, the factory employed about 50 people, some of them commuting from Vysočany, which would not be problematic with today’s public transport network, but in the 1920s there was only a train from the Main Railway Station scheduled for Hostivař (in 1930 a bus connection to Prague was

introduced, yet despite many requests, the Hostivař locals had to wait for a tram until 1954). It was no wonder that most of the Vysočany workers gradually left the company over the next few years, and the staff size decreased to about 36, consisting mostly of local Hostivař employees (at the beginning of the war PRAKAB would give work to twenty times that number, at the zenith of employment in the sixties more than thirty-five times that number). Assmann recalls some other forgotten names from this first Prakab generation, of which we will mention but a few: the Diviš brothers worked in the warehouse, Mr. Hering worked at the spreading machine, František Veselý worked at the spraying machine, foremen Sattaler's sons from Austria worked at the wire drawing machine, the vulcanization boiler was taken care of by Mrs. Černá, Josef Kalaš operated the lead press (he became foreman in the braiding plant later on), and Mrs. Kalinová was in charge of adjustments; asphaltting and dyeing was something done by Mrs. Dvořáčková, Eman Beck worked at the tin plant, Mr. Koran produced rubber-cutting knives and maintained braiding and organizing machines. The locksmith's workshop with two workers was managed by Mr. Bartoš, one of his assistants worked as a driver: *"He drove a small truck, he entered the production hall, turned around calmly, loaded the goods directly in the adjustment area and drove off to Prague to deliver the goods,"* recalls Assmann.

In 1923, experiments began with in the production of enamelled (enamel) wires; PRAKAB was the first company in the Czech Republic to do this, so Emil Kolben invited an expert from Germany. Václav Assmann has the floor again: *"A square furnace about 150 cm long was built in the right corner of the main hall, which is where the developed products were tested. It was truly an ordeal for the entire small hall's staff, as all the vapours from the varnishes emanated directly from the furnace, spreading into the entire hall. This is why the enamelling furnace facility was walled."* However, the development succeeded well, and very soon four new round furnaces were built; in 1930 production began in a new building (built according to the design of the builders from Dr. Kauder & Weisskopf's company). The company had the enamelled garnet and black gloss wires patented under the label Granat, Email-Granat and Granat-Emaildraht (1931) brands. Their quality was pretty much acclaimed at the time, in many ways surpassing even enamelled Swiss wires.



Office of Construction department

Assmann's recollections reveal that this technology was unfortunately lost after the company was nationalized. Anyway, the factory expanded thanks to this technology with another production section, setting up its own wire drawing plant for these wires (1930). Former manager Emil Buchlovský described the very beginnings of varnishing in 1971: *"For several years, the varnishing technology remained very simple. The braided cable was pulled through a tray of varnish and while still wet, it was hung in loops on racks placed in a room equipped with very efficient heating. Upon hanging the cable on the racks, the room was closed and heated to about 80 °C, drying the cable within one day. Continuous drying ovens were introduced as late as in 1932."*

The German expert, whose name we unfortunately didn't succeed in uncovering, was mentioned later again several times. When discussing archive materials, it is interesting to see how the opinion of his person changed depending upon the political situation. From the perspective of the company's future operation, he undoubtedly made a major contribution (as there was no one in Czechoslovakia who knew this technique), the "Národní listy" paper at this time generally speaks of *"Excellent foreign experts"* who helped the company *"in equipping it with state-of-the-art devices"*, whereas later socialist reports downplay the expert's contribution speaking succinctly of probable industrial espionage.

Plant extension

Another sector the cable company (as well as other Kolben companies) started penetrating into was the ever-growing automotive industry. During the 1922–1926 period, the number of registered motor vehicles in Czechoslovakia rose by an incredible 298%, so it was no surprise that the ČKD group, which Kolben had set up, soon founded its own carmaking company – Praga. Of course, the car manufacturer didn't procure from competitors parts that Kolben's companies managed to produce themselves, so PRAKAB soon started supplying ignition cables, as well as wires for lights or cables for starters. Kolben himself was keen on cars, and he was especially fond of open convertibles (Praga-Golden and Praga-Lady), owning representative cars himself, which Pragovka made as an order production for him as prototypes. These cars already had an electric shifting system back then excluding a clutch, even with built-in hydraulic jacks to lift the car at any time, if necessary. After all, Praga experimented with the first electric cars as well and, in cooperation with a Kopřivnice car manufacturer, it actually produced them. Yet the time had not yet arrived for the e-cars to spread further.

In addition to motoring, the 1920s witnessed a huge increase in demand for another invention – the radio. The Czechoslovak Radio Station, originally called Radiojournal, launched its broadcasting in May 1923, but the first rehearsal concert was broadcast as early as on 29 March 1923 from the station's first studio in Kbely. The radio quickly overcame its initial technical issues; music productions (usually played by musicians live in front of the microphone) were accompanied by simple radio presenter inputs related to sports news, weather forecasts and stock market information. Both technology and the system improved, and the radio soon started to broadcast concerts as well as performances from the National Theater (which soon withdrew from the collaboration, as it was afraid of the large response and feared that attendance in the theatre building itself may drop). It is not without interest that live concerts had been broadcast even before music played from gramophone records started dominating the broadcast production. The receivers were soon sold in the thousands, and PRAKAB in Hostivař supplied the cables and wires to make these devices.

The company also participated in charity activities, one of which included supporting the Institute for deaf children in Košice,

where experiments with teaching children suffering from hearing loss were carried out using hearing aids or amplifiers, which were virtually the predecessors of today's hearing aids. This was another visionary project Emil Kolben participated in with his company (the company also made annual donations to charity organisations for blind or deaf children).

We may go further extending this list even more. PRAKAB quickly became a well-respected company, and in the summer of 1924 it figured among representative factories as part of the international VI Congress hosted by the Electrotechnical Association, and foreign guests headed to Hostivař for an excursion. At the end of 1925, this enterprise, along with the competing companies Křižík and Köppele, became a member of a group of companies that repeatedly won lucrative state contracts issued by the Ministry of Posts and Telegraphs to supply large insulated wires for a rapidly expanding telephone line network.

In addition, from 1 January 1927 PRAKAB and five leading Czechoslovak cable manufacturers merged into a cartel. establishing joint stores for insulated conductors, allowing them all to reduce product costs. This enterprise was named Isomat; the cable companies were equally represented in it, and their warehouses merged into a single warehouse. Orders were distributed according to production capacities and geographical efficiency. The companies simultaneously established warehouses and insulation pipe stores using the same method and labelling them Isotuba (PRAKAB wasn't included, but another Kolben factory offering this product range became its member).

The company introduced itself superbly. In 1926, the Walter Custer construction company (of which Kolben was a shareholder) based in Karlín began to gradually build residential semi-detached houses with rounded gables near its gatehouse. These were intended for prominent employees, and three of these were gradually built for twelve families (the buildings were demolished in the late 1960s). In 1921, PRAKAB achieved a profit of 84,217 CZK, reaching 456,341 CZK in 1929. Emil Kolben was indeed successful, but sad news reached him during this period, which seemed to foreshadow the Kolben family tragedy.

Emil's brother Ludvík, with whom Emil had been trying to use electricity in agriculture at Petrovice, left this village where he had been mayor in the years preceding the establishment of the First Czechoslovak Republic. He moved to the town of Rychnov nad Kněžnou, where he rented the "Karolín yard" (dvůr Karolín) with a distillery. Perhaps he just lacked his brother's business

talent, or perhaps it was mere misfortune, but he simply didn't manage to keep the company going and fell into debt. In the summer of 1927, he sold his house in Prague, but even this money didn't save him, and when the court burned down on 3 November, Ludvík fell into despair. A few days later, he arrived in Prague and shot himself in the head in a park on Slovanská Street in the Královské Vinohrady city district, not far from Emil's house.

Glory and crisis of the First Republic



Employees in front of the main building, 1929

In 1927, further extensions were being built; the Ferdinand & František Koubové company worked on a new transformer, a dryer (approved in February 1928), and a canteen for employees was erected as well. At the time and apart from the railway itself, goods were being transported on four trucks. PRAKAB did not yet have many direct neighbours. To the south, there was the *Host* mill and bakery, which was going bankrupt at the time and where film studios immediately sprung up, and there were also *Pražské sklárny* (Prague glassworks), replaced by the *C. T. Petzold a spol.* sheet metal and enamelled products company. To the north, there were several smaller factory buildings pertaining to the Vinohrady-based engineer Václav Zadražil, who produced asphalt emulsions and later leased the facility to the Žižkov-based company named *Václav Pařík*, which produced spirals, springs, car bumpers and

seats (today, the *Pražské vodovody a kanalizace* (i.e. the *Prague water and sewerage works*) is based here). To the east, the hitherto only site was the pharmaceutical-chemical company named *B. Fragner* producing chemicals and pharmaceutical products (today's *Zentiva*). To the west, new villas being built behind a large field, and the well-established Hostivař-based company of Václav Černý producing various types of scales (in today's building at the address Štěrboholská no. 560) extended its manufacturing sites to this place.

All these production site and assortment extensions meant hiring more and more people, and by the mid-1920s, around hundred workers were employed by PRAKAB, with this number rising up to three hundred during the 1930s. It seemed that nothing will jeopardize this business running smoothly. However, the situation was far from simple, and during the first two decades of its existence, the First Republic struggled with several difficult periods.

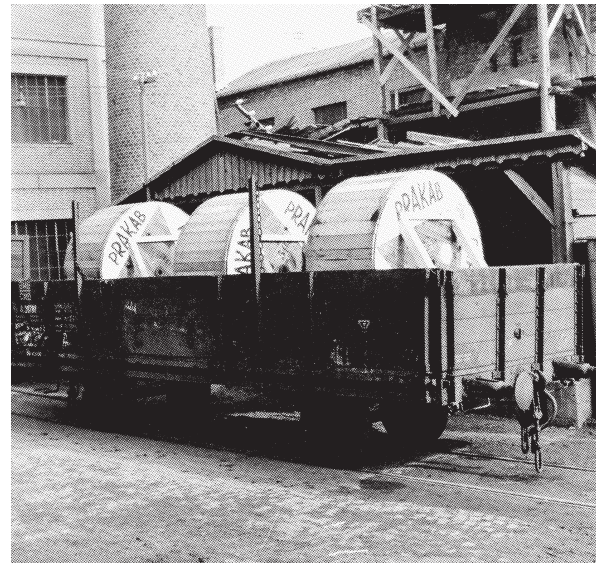
We mustn't forget the difficult post-war situation our young republic fell into. Despite the euphoria from gaining independence, the country was predominantly struck after 1918 by a great shortage of many raw materials, with the absolutely indispensable coal figuring on top of this list. There probably wasn't a single industry not facing problems, and even in the Hostivař-district the first large-scale companies went bankrupt at this stage. Cable manufacturers in particular suffered from a lack of copper and rubber. At the end of 1919, leading companies in Bratislava and Podmokly near Děčín (in North Bohemia) interrupted their production as a result of insufficient raw material volumes. And once the material was eventually available, the situation was complicated again due to mostly Italian importers who started supplying the Czechoslovak market with cheap goods. Another competitor was Austria with cheap cables, which included both unused war supplies and inferior recyclable "waste" directly from the battlefields. In this era when materials were running short, even these below-average quality products sold, reducing the already small income of cable companies. Production stagnated, many companies had a surplus of more expensive goods, which was caused by imports, and factories reduced prices or focused more on exports than on covering domestic demand. *"It is advisable that the Office of Foreign Trade mind this development,"* the *Čas (Time)* daily newspaper wrote in February 1921. The situation led to long-lasting negotiations on the customs protection of Czechoslovak cable manufacturers. Readers won't be surprised that Emil Kolben was significantly involved in this as well.

Who were the players in the domestic cable industry at that time? When the Bohumín cableworks broke down in 1922, there were about a dozen major companies competing in the mid-1920s. Above all, Křižík's modernized company named *Českomoravské elektrotechnické závody Fr. Křižík a.s.* played a dominant role at the time, as it also took over the Bergmann and Chaudoir plants in Podmokly. Given the difficult situation in the early 1920s, Křižík also merged with the second largest domestic cable manufacturer in Bratislava (*Továrň na káble (Cable factory)*) established by Otto Bondy in 1895). Quite soon, the young but strong central-Bohemian Kladno-based company *Kablo* (established in 1920), backed by German capital of the Family Deutsch, and *Československá pošta* (Czechoslovak Post) from 1924, also had a share in this. There were the following companies: *Köppel* in Prague (which moved to the Moravian town of Valašské Meziříčí), *Arachne* in Brno, *Heinrich and Stark* in Kraslice (liquidated in 1925), *Clement Zahm* in Vejprty (later incorporated into *Kablo Kladno*), the *East Bohemian cable works* pertaining to engineer Arnold Löwit operating in Vrchlabí, Rehatschek's *Severočeská továrna na kabely (North Bohemian cable works)* was active in Březeneč near Chomutov until 1926, and brothers Jindřich a Vojtěch Stach, who later on focused on manufacturing the Tatra brand bulbs, had their entrepreneurial base near Moravská Ostrava.

However, most small-sized companies gradually fell out of the big game. Czech Financial Minister Alois Rašín's tough monetary policy bore fruit, the national economy stabilised, but it also fell on the shoulders of the poorer classes, even resulting in the successful assassination the Minister of Finance. The situation improved with a strong boom period, but it was succeeded by the global economic crisis copying the fall of the New York Stock Exchange in October 1929.

The crisis also manifested itself in Hostivař, where there was radical leftist press (*Rudé právo (Red Right)*, *Dělnická rovnost (Workers' Equality)*), the big Hostivař-based industrialists were blamed for dismissing people, for being improperly harsh towards workers, for unpaid overtime work, while communist propaganda described the conditions in factories right to the opposite direction. In Hostivař, the heaviest strikes took place in 1932, the police put a ban on the gathering of crowds, the gendarmes patrolled factories, and the atmosphere worsened considerably; there were also verbal battles in the press. The workers in one of the largest local shoemaker factories owned by František Štěpánek actually refused to go to work for almost two months.

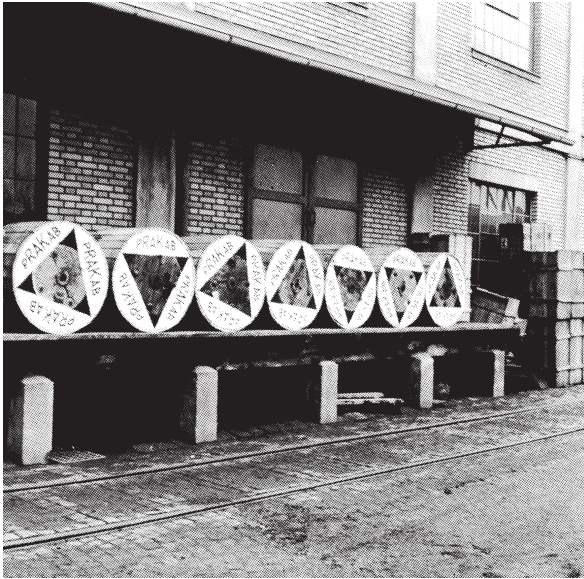
Worker uprisings usually circumvented PRAKAB, which we can probably attribute to Emil Kolben's prudent corporate policy. By the way, a case of how Kolben first reduced management wages at the Prague-based engineering company ČKD so as not to reduce worker payments was recorded. We shouldn't overly idealize his approach to factory employees, but this engineer was a great businessman, and he certainly calculated that a satisfied worker works better than a dissatisfied one. As far as we can judge from archival materials, the situation between the workers and the factory management at PRAKAB never really escalated. Additionally, the company established the "Podpůrný fond zaměstnanců" (i.e. the Employee Support Fund) in 1928 with a volume of 48,000 CZK, the interest on which was intended to be paid out as a subsidy in urgent social cases.



With its own siding, the cables traveled on the railway and along it to the whole of Europe

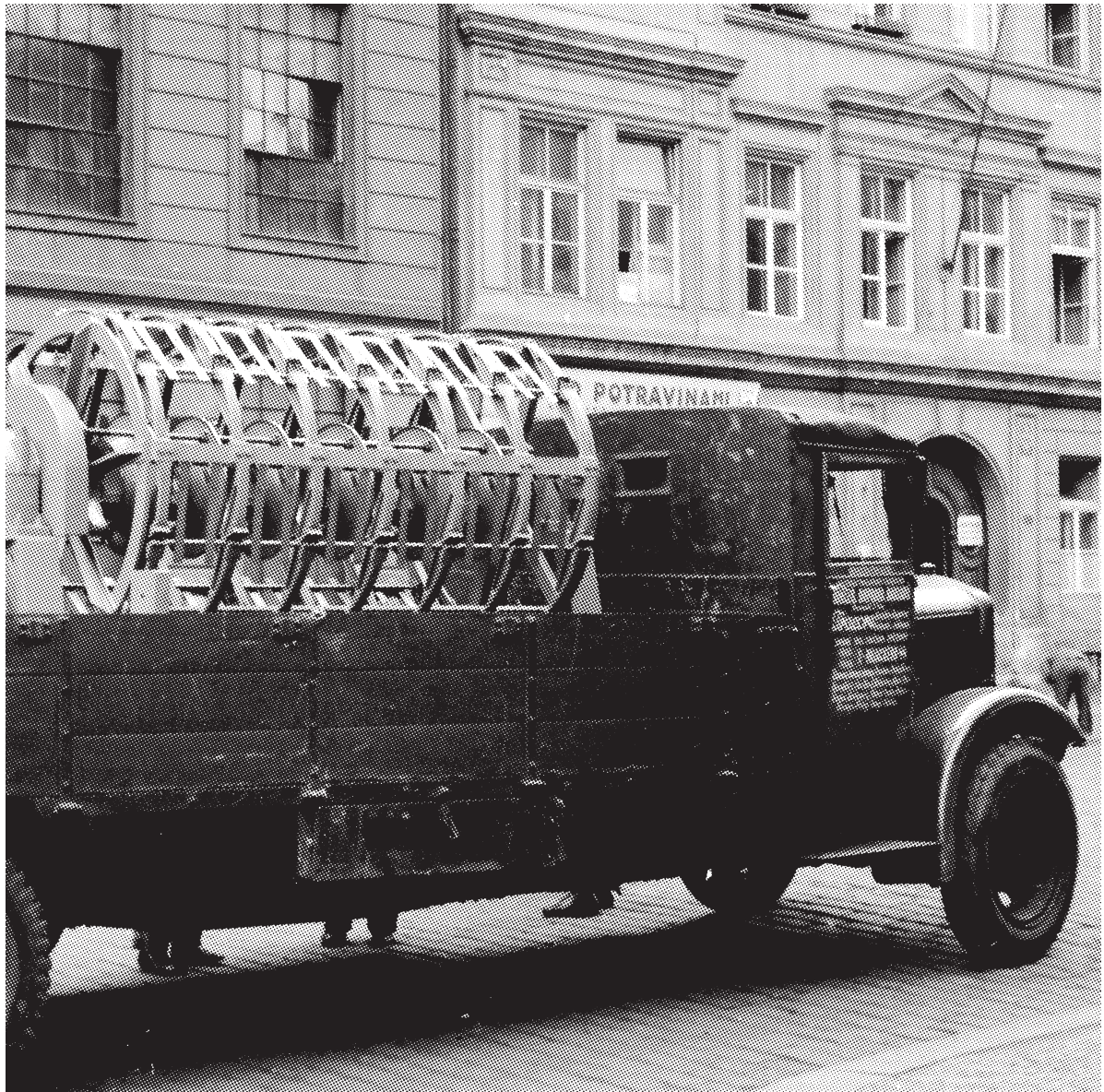
The District of Prague XIII Almanac (Hostivař became part of Prague District XIII upon joining Prague) from 1934 states that the company *"Employs 250 people on average, and in order to not have to dismiss them, it also starts to focus on exports at this time, yet unfortunately selling below the production price"*. The General Meeting minutes from 25 November 1935 tell us the same. There have been several speeches preserved in the factory archive held by long-term employees of the company on

the occasion of important anniversaries, of which we will quote the following: *“It was 1932 and the entire world was struck by a crisis,”* as one of the workers recalls, unfortunately an anonymous one. *“Misery and hunger came. The beginning of the crisis struck our plant as well. Some workers were fired, weekly working hours reduced to 40, yet earnings went down proportionately. However, this period only lasted for about one year. Afterwards, there were so many orders, especially export orders, that we worked for three shifts even on the braiding machines. There were orders to be shipped to Australia, Africa and Asia. (...) These export orders helped us in overcoming the crisis, enabling us to increase our staff size. In fact, the orders were so large that one plumber did nothing but tin the boxes so that the goods destined for sea transport didn’t get wet.”*



PRAKAB cables are heading out into the world

Thanks to the flourishing foreign trade, the company also came up with an English and French name, namely *Prague Cableworks Company Ltd.* and *Cablerie de Prague Société à responsabilité limitée*, respectively. Members of the Kolben family, as well as Austrian partners who had a financial interest in the enterprise, subsidized the factory out of their pockets during the crisis (these were interest-bearing loans). One of the means



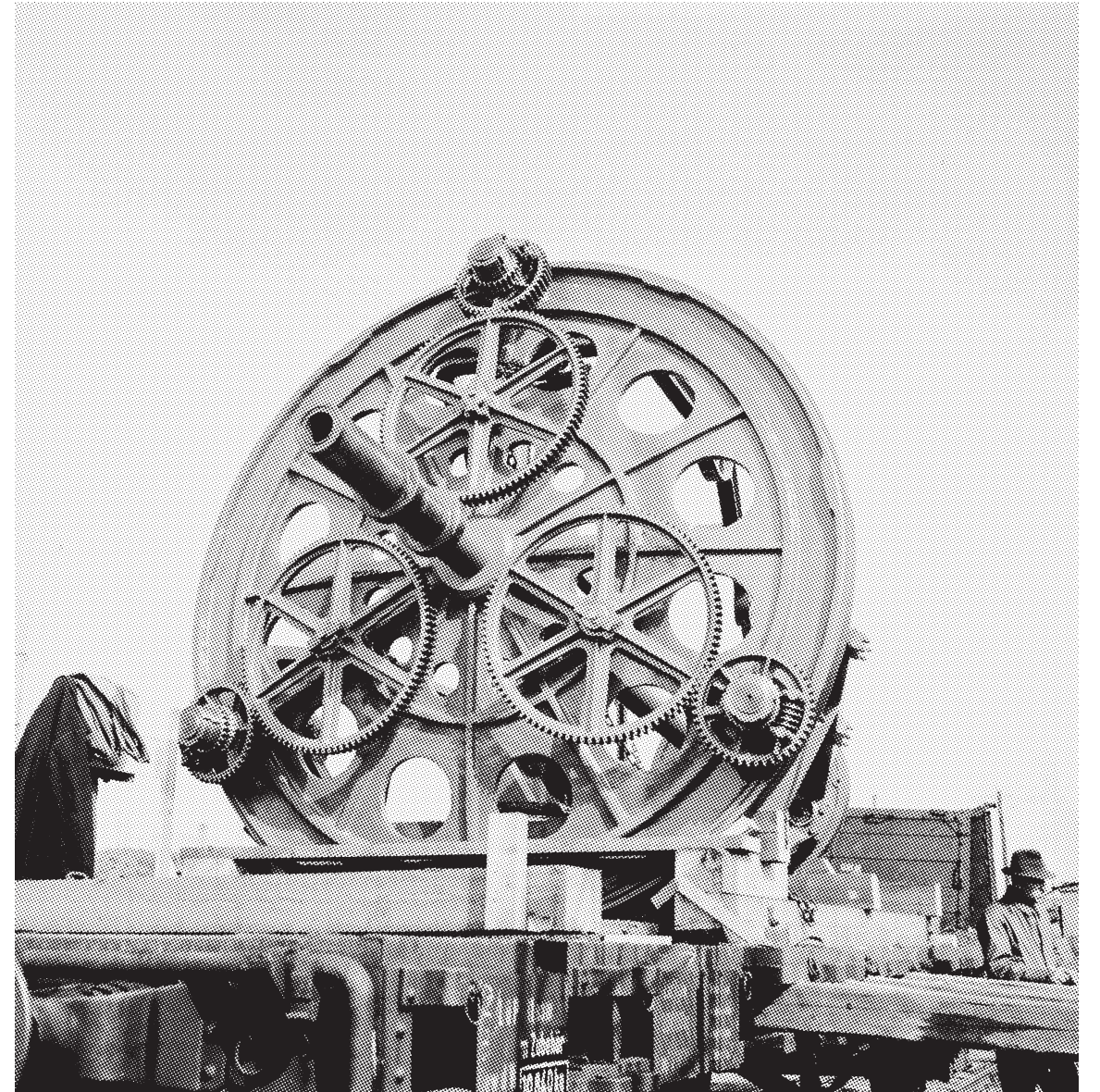
New stranding cage on a truck



Arrival of boilers



Assembling of the stranding machine



Detail of the stranding machine



Folding boilers from wagons



Starting a new machine

to combat the crisis was also the cartel agreement concluded on 1 August 1933 (modified and extended later) between the largest players on the Czechoslovak market: PRAKAB, František Křížík's company, the Bratislava cable company and Kablo Kladno. The agreement stipulated sales quotas on the lead-coated cable market, delimited the area where the companies would be active on the market, and established cartel authorities to monitor compliance. This contract helped unify prices and costs.

The PRAKAB ownership ratio witnessed changes as well. Originally, Emil Kolben owned 36% of the company, with the rest belonging to the Schwechat partners, but over the years, the director of the Schwechat factory, Hugo Freund, and some of the other shareholders sold their parts to him, so by 1926 Kolben himself already owned a majority of 67%. In January 1927, he transferred a 10% company's share to his daughter Grete, the wife of the factory director (who acquired a further 10% in 1932). The mutual shares slightly shifted, and they were as follows in 1936: Emil Kolben 50%, Grete Kolben-Schück 24%, Robert Eger 15%, Henriette Steiner 5.5% and Gisela Wiese 5.5%. Despite declining profits, the company successfully overcame the crisis, and the General Meeting minutes from 6 June 1937 says that the 1936 company turnover rose in comparison to previous years, although the prices of the main raw materials rose rapidly.

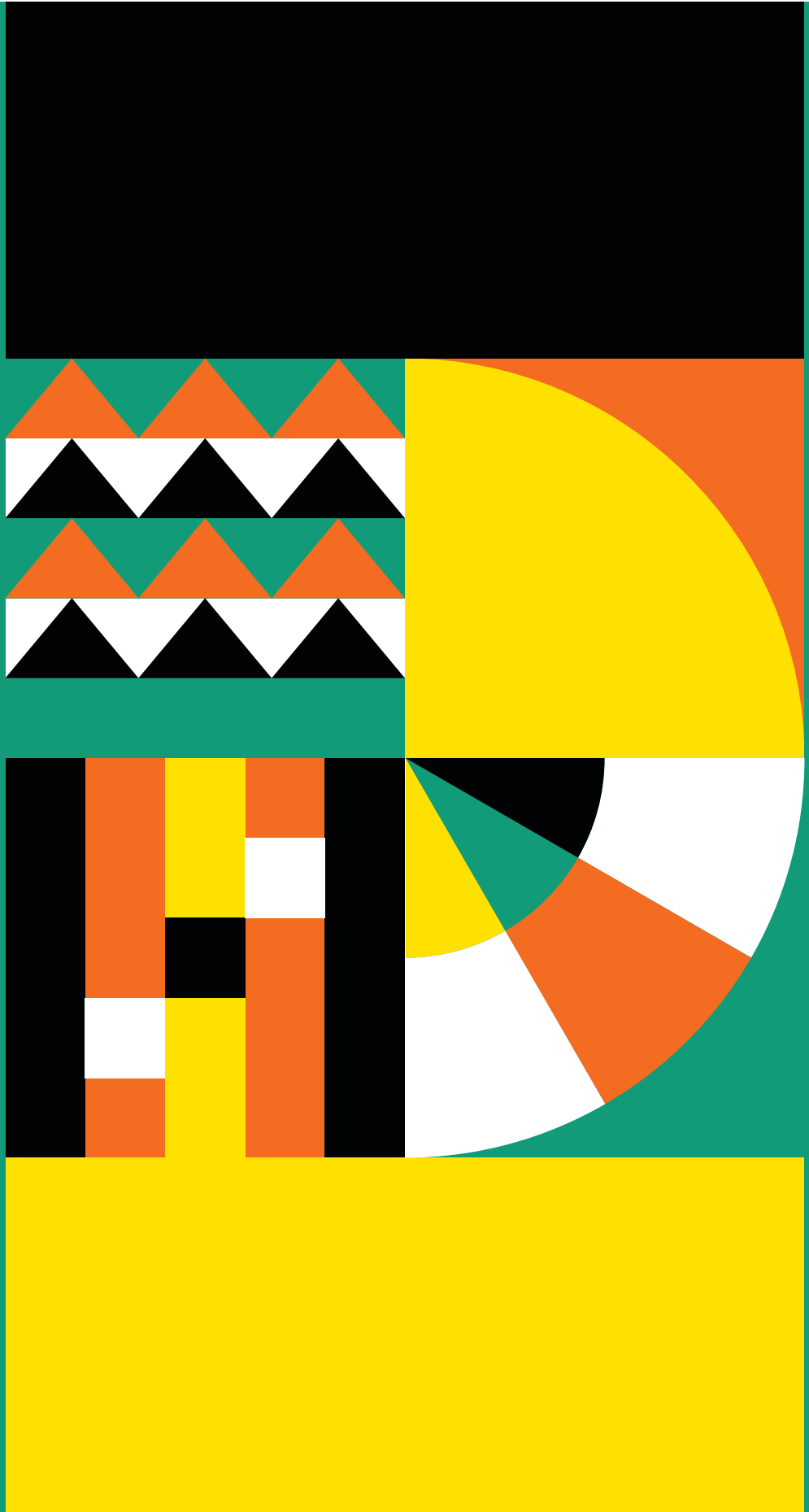
We shouldn't forget that PRAKAB also had several disputes with the tax office repeatedly, as in 1933 when the state even foreclosed part of the goods deposited at the Ministry of Posts and Telegraphs (due to more than 50,000 tax arrears). At the end of the 1930s, the Tax Audit Committee scrutinized the company's accounts for a long time, discovering several irregularities within the double-entry bookkeeping, including unclear private payments, related to Emil Kolben and his son-in-law, Ignác Schück-Kolben, the company's director and managing director. The Commission didn't like the depreciation related to the expenses for the name change of Ignác Schück (to Schück-Kolben), Emil Kolben's construction of a private house, the depreciation related to the debts of Emil's son Hanuš Kolben, who was unsuccessfully conducting business with batteries and accumulators, or Robert Eger's, i.e. a partner's (and company auditor), trips from Vienna to Prague covered by company funds. Furthermore, the Committee concluded that Emil Kolben's main occupation at PRAKAB was not as executive, but his activities related to the ČKD company, which is why it was impossible to deduct the reimbursement of expenses associated with his post at the cable manufacturer.

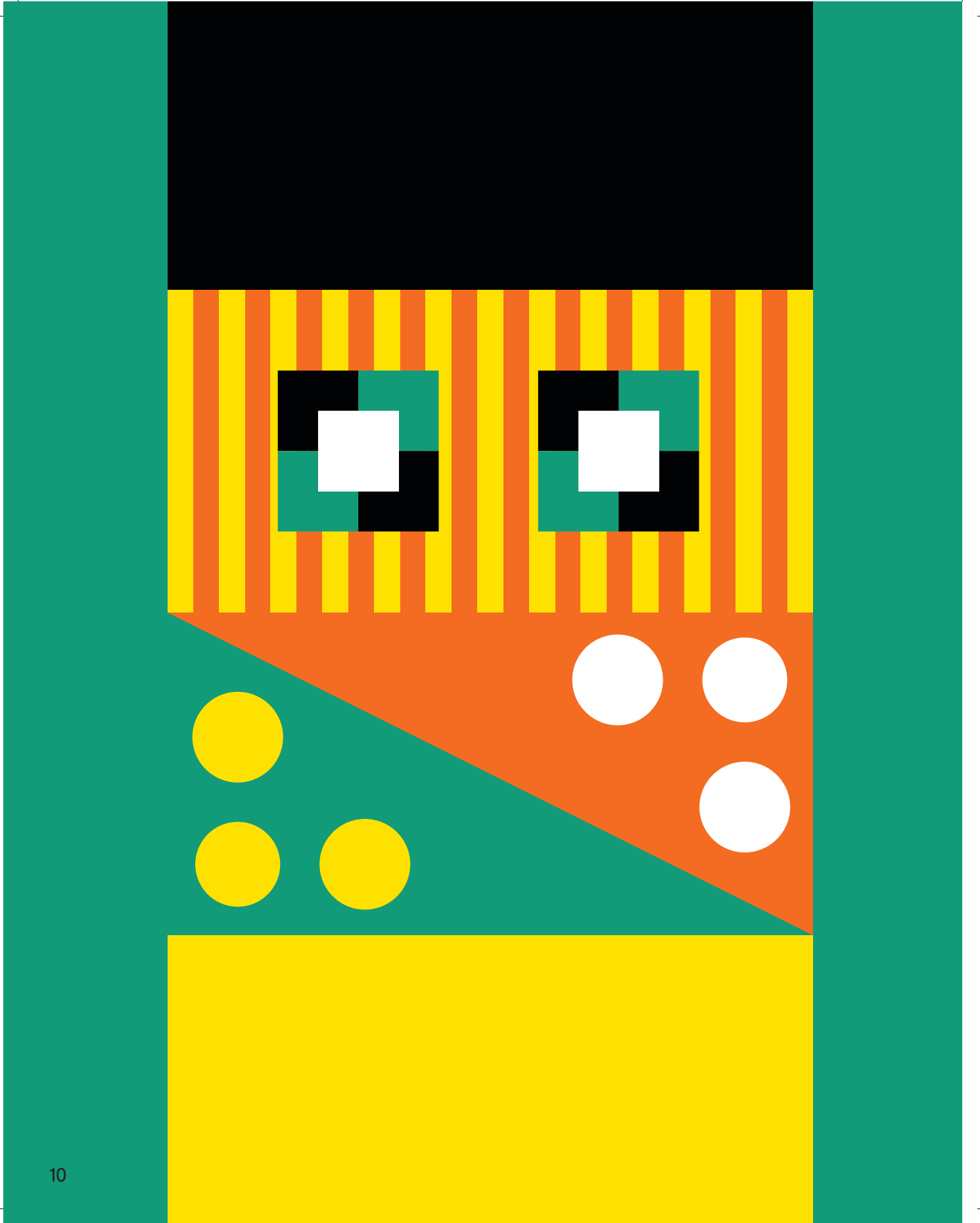
To put it briefly, the company fought the crisis by all means, so why shouldn't we admit today that not all of them were 100% according to the law.

"When the most difficult crisis period had passed, the factory began to flourish again, and its importance also increased." Lidové noviny wrote in 1941. *"The Prague Cableworks, a long-established Hostivař company, has become a great example in Prague's new industrial district, exemplary both in terms of production and social as well as hygienic measures."*

But there were also other operational complications, or in other words – the economic crisis did not have to interfere – sometimes the weather did so as well. *"In 1929, the plant was hit by a heavy frost wave, when the thermometer dropped to minus 42 °C,"* as Václav Assmann, the stoker we mentioned above, recalls. *"A significant pipeline section froze down and was torn apart. The railway didn't manage to bring in coal as the locomotives stood still due to the dazzling frost, so the coal was transported from Kladno by cars, unsorted and under very difficult conditions. It turned out that boilers with such a small heating surface were insufficient, so in 1931 a new 80 sqm heating surface Tischbein boiler was built with an overpressure of 12 atm. At the same time, a new 35 m high chimney was built."*

Although part of the PRAKAB goods were sold via the Isomat cartel, it provided other products directly (prices were fixed and subject to the executive committee supervision, which was the cartel agreement's official body), and it had branches in many cities in addition to Prague such as those in Pilsen, Teplice, Brno, Olomouc, Ostrava, Bratislava and Opava. Yet there were branches operated not only in European cities, but also in Casablanca (which was then under the French Protectorate), Morocco or Haifa in Palestine (under British administration). Even in times of crisis, PRAKAB contributions to various charitable organizations, such as the Ústřední matice školská (Association supporting Czech schools), the sisters from the Mariánský ústav (Sisters of the Marian Institute), the Klárův ústav slepců na Malé Straně (The Malá Strana Klárův Institute for the Blind), the Red Cross and the Prague Philharmonic. Donations were made to children's homes, to Československá ochrana matek a kojenců (Czechoslovak Institute for the Protection of Mothers and Infants), and helped buy clothes for poor children. The company also financially supported railway workers, postmen, firefighters or war invalids.





The twilight of freedom

Finally, neither the crisis and competition, nor the weather brought by fundamental changes, but the aggressive policy pursued by Adolf Hitler and the Second World War did. On 29 September 1938, an agreement was signed in Munich on ceding the Czechoslovak border territory to Germany. Vivid disputes have remained in our country to this day about how our political representative were to have reacted at the time and whether Czechoslovakia should have stood up to Hitler using its army. Many citizens protested in Prague back then, wanting to openly fight Germany, even though it would have been a lost war right from the beginning (PRAKAB workers attended the several thousands strong demonstrations in front of the parliamentary building on 22 September, and this company was actually the only one to entirely stop production). The political situation was severely tense, the company was also preparing for material aid to be supplied to the border regions, but there was nothing to prevent historical events. Finally, everything inevitably led to 15 March 1939, when the country was occupied by the German army. Afterwards, the Protectorate of Bohemia and Moravia was declared, with Slovakia breaking apart one day before the establishment of its own fascist country.

The cableworks themselves were a strategic industrial enterprise, in the further operation of which even the Nazis had their interest, yet the problem consisted in the Kolben family and the Schwechat-based partners within the management. Another issue unacceptable for the Nazis was the Jewish co-executive in the company management (from 5 April 1935) – Miss Marta Vogelová, who was in no way related to the Kolben family or the Eger family, and probably worked as a “dummy”. This seems to be the only thing to explain why this otherwise inconspicuous corporate clerk would be appointed company executive alongside Emil Kolben himself. At the end of the 1930s, even the tax office became interested in her position within the company.

Although there was no Orthodox Jewish member in Emil Kolben’s family, the hard anti-Semitic National Socialism demanded that they immediately resign. The family knew about the menacing situation, Germany was publicly declaring its anti-Semitic plans, but no one expected the monstrous extremes this would soon grow into. The only ones among family members to feel the seriously threatening danger were Emil Kolben’s daughter Grete and her husband, Ignác Schück-Kolben, who was also the

PRAKAB director. The couple and their sons Gerhard and Robert emigrated prior to the country's occupation by the Nazis and moved to London. Gerhard (*1921) joined the Royal Air Force (RAF), where he reached the rank of sergeant (his name is one of those listed on the monument to the pilots in Klárov). The family later settled in Australia, where the former factory director died on 24 August 1959. Grete lived up to a respectable age of 90; she died in Sydney on 14 June 1988, and her sister Lily, who arrived in Australia later after the war with her son Harry (Harold), reached an age of 88 – she died in Sydney in 1990.

Hanuš Kolben, Emil Kolben's only son, virtually took over the factory director's post, although he was probably never officially appointed (at least contemporary documents don't tell us this, yet according witnesses of contemporary events, he retained this position). In light of his seemingly unshakable position, his international reputation, good relations with many high-ranking industrialists and politicians, and finally thanks to his merits for German technical education in Czechoslovakia, the company founder himself refused to emigrate. Kolben refused to accept that he may be in direct danger. *"Nobody can do anything wrong to me, Kolben;"* these were the words he said according to his grandson Henry, while fiercely refusing to emigrate.

Hanuš Kolben

We have already mentioned that although Ignác Schück-Kolben formally remained PRAKAB director (until 30 April 1939), Hanuš Kolben took over the highest management post. This is worth taking a closer look at, although he finally remained in office for just a very short time due to rapid political developments. He was born when Kolben was working in Zurich, Switzerland, and the young family virtually got him as a Christmas present; a blond boy with blue eyes who saw the light of day on 20 December 1895. He started studying before the First World War broke out, intending to study chemistry, but at his father's request, he finally focused on electrical engineering just like Emil Kolben. Due to the war, however, he had to interrupt his studies, which he completed in 1920, fulfilling the practical study program obligations at his father's business in Elektrotechnická. His first employment wasn't here, but for unclear reasons, he first joined the Trmické železářny (Trmice ironworks) in Ústí nad Labem. Although he was treated with great respect and

received an excellent certificate evaluation due to his expertise and very kind nature, he was probably dissatisfied here, which is why he returned to Prague in 1925. This was the first time he joined PRAKAB under the guidance of his brother-in-law. He worked as a sales representative, but he had no preferred post as the Kolben family was extremely strict in this respect. *“The contract on the representation of the company and the sale of products in Sudetenland described his father’s rights and obligations in fine detail, including the expenses for building a warehouse and an office, as well as the housing allowance amount,”* writes Hanuš’s son Jindřich. *“After two years, the contract was renewed with a new subject, which consisted in supervising the electrical equipment and the plant’s test facility. For doing this, he was entitled to receive a salary of 2,000 CZK per month, but he had to cover travel costs as well as other expenses on his own.”*



Ing. Hanuš Kolben was the director for a short time

It’s no wonder he felt overlooked here. Finally – perhaps because of his pride – he decided to stand on his own feet. In 1927, he set up his own limited partnership with his partners, with the enterprise focusing on electric batteries and cells. It was based

in Smíchov, or on Kartouzská Street no. 204, to be more precise, where he shared his premises with Mautner's textile factory and Richard Heller's playing card production company. Hanuš shipped batteries for the Kolba-Diamant flashlights. PRAKAB joined his company as a limited partner with a 40,000 CZK share, due to which the term "sister factory" was used.

This company wasn't small; during the best days in its production history, Hanuš Kolben employed about 150 workers. However, the company wasn't successful as it was in the red from the start, and it was also heavily hit by the economic crisis, ending up in insolvency after five years. PRAKAB helped in settling the debts when the company was liquidated, and Emil Kolben even compensated the Austrian partners for the losses they would have otherwise suffered from his own pocket – so that they didn't lose their money.

Shortly before this, Hanuš's first marriage to his wife Alžběta, with whom he had his sons Hanuš-Werner and the above-mentioned Jindřich, fell apart as well. Despite his company and his marriage breaking down, Hanuš had the happiest period of his entire life ahead of him and devoted himself to painting (influenced by the Impressionists), fell in love again and happily married Anna Gastgeberová.

He also started to work at PRAKAB again, reorganizing export trade, and he was later in charge of managing the factory. The Kolbens were probably were counting on him getting a certain function later on, and at a time when the company was still transformed into a joint-stock company at the beginning of the war, Hanuš wrote a formal letter to London addressed to Ignác, where he authorised him to represent the cableworks abroad, defining his rights and obligations. However, everything turned out differently soon, and on 30 May 1939, Hanuš also left the company due to the Aryanization carried out there. Unfortunately, the future was to become completely different.

The link to Křížík's company

Having lost the Sudetenland, the situation in the country became very tense. Hitler escalated his pressure, and European powers desperately and unsuccessfully tried to prevent war. The menacing Nazi expansion became evident even before Czechoslovakia was occupied, and this threat helped former rivals

to merge, who were now even co-workers in the cartel. The *Křižík-Chaudoir, měďárna, kabelovna a elektrotechnické závody* (*Křižík-Chaudoir, copperwork, cableworks and electrotechnic company*) started negotiating with Kolben about joining the company (both gentlemen had already considered merging their companies in 1904, yet they didn't reach a proposal stage to satisfy both parties).

In 1918, František Křižík more or less of necessity transformed his company into a joint-stock company and was elected chairman of the managing board, but his memoirs clearly reveal that losing the key role in the company meant losing his inner relationship with it. He soon withdrew from the company that was gaining economic momentum and bore his name, even though he had retained his post within the board. With the Sudetenland having been torn apart from the country, the company lost one of its most important production sites – the Podmokly cable factory – and it was looking for an opportunity to make up for this loss. Everything seemed as if the parties were to agree, Kolben and his partners would sell PRAKAB to Křižík and also a part of ČKD, where Kolben retained his key role. Křižík was to take over a 74% majority share in the company and a 26% minority share at ČKD. At the time, the cableworks had a capital of 4,400,000 crowns. But before the agreement was finalized, the Nazis invaded and occupied the country, which meant that an entirely new political situation arose. Kolben, who was Jewish, was no longer entitled to be part of any large company, and he had to resign from all important management posts in companies, as well as in the board of directors, which first and foremost referred to ČKD.



On January 1, 1942, the factory fully passed under Křižík's joint-stock company

The Nazi authorities worked very rapidly. On 13 May 1939, the Prague Cableworks were bought by Křižík-Chaudoir and the Saxon company Franz Adolph Lange with a 67:33 share ratio; interesting facts: Křižík-Chaudoir bought Emil Kolben's 50% share worth 7,480,000 crowns and the 17% share from his daughter Grete (the new director Engelbert Schicht himself bought another 7% of the shares in a total value of 3,590,400 crowns). The F. A. Lange company bought 15% from Robert Eger (2,244,000 crowns), 5.5% from Henrietta Steiner and the same volume from Gisela Wiese (both 822,800 crowns each). The Imperial Protector approved the deal on August 12.

PRAKAB was immediately transformed into a joint stock company. The inaugural general meeting, which Emil Kolben still participated in, was held on 31 May 1939, and it was registered in the Commercial Register on 15 September of the same year. The share capital was divided into a thousand shares worth 4,400 crowns each, and it was almost immediately increased to 11,000,000 crowns. Baron Ernst von Laer, a helpful man who tried to fulfil the wishes and respond to complaints of the factory workers, joined the managing board on behalf of the Lange company. In spite of the fact that Křižík's company wasn't pleased by the link with Lange (or rather by the ownership ratio), it says: *"We have to consider it very advantageous both for the present and the future that we at least had the option to choose the shareholders and that they are friendly to us."* (16 February 1940). In 1943, however, Křižík-Chaudoir paid off the Lange company merging with PRAKAB with a retroactive effect going back to 1 January 1942, which meant that the factory was entirely part of Křižík's joint-stock company. During the war, the company headquarters moved from the upper part of Wenceslas Square (no. 49) to the lesser one, i.e. to Ovocná Street 13 (today's "Ulice 28. října"). Consequently, the independent Prague Cableworks Company thus disappeared, yet work in the factory did not stop.

The situation didn't work out any better at the lost sister company in Schwechat after Austria had been annexed to the German Reich in March 1938. Until then, the Schwechater Kabelwerke had still been managed by director Hugo Freund, who was also of Jewish descent, which was why the owners agreed that two long-time, non-Jewish employees would be managing the company from now on: Johann Breiner and Karl Schimik. Although Robert Eger had previously converted to Protestant faith (Henrietta Steiner, another shareholder, the widow of the company founder, was also Christian), what mattered to the Nazis in their

horribly-monstrous ideology was origin, not beliefs or personal confession. To them, a Jew who had converted was still the same enemy as someone who confessed to Judaism. Shortly afterwards, Karl Schimik died and Johann Breiner became the company's CEO, but Hans Rott, loyal to the Nazis, was soon installed in the management by the Nazis, and he had Robert Eger and other shareholders removed. Finally, the Nazis took full control over the cableworks with the Jewish owners still having to pay a 25% "Reich Escape tax" and, in addition to that, they had to pay the tax office an additional "Jewish property tax". The expropriation, i.e. the Aryanization of the enterprise, was completed.

After PRAKAB had merged with Křižík's Company, Engelberg Schicht became the confidential clerk and supreme director while Ing. Dr. Karel Risinger became its managing director. The second general meeting held on 15 January 1940 concluded that the company had already paid out all the deposits associated with Jewish merchants. The employment relationships with Hanuš Kolben and Ignác Schück-Kolben, who had emigrated, were terminated, and very soon all the other employees of Jewish origin were dismissed (Marta Vogelová, Marie Würzburgrová, Gréta Freundová-Polláková). The Hostivař factory management itself was temporarily taken over by Ing. Vladimír Kocman, who later became the Podmokly cableworks director, and after the war he worked as a well-respected university professor in electrotechnology at the Brno University of Technology during the 1960s. Even before the end of the war, company management was taken over by a long-term employee, Ing. Jan Hrdlička.

Selling the shares meant that the Kolben family's influence in PRAKAB was definitely terminated, and so was for many years to come the Schwechat cableworks share. However, ceasing to be industrialists would have been a minor tragedy to strike the Kolbens.

The ruin of the Kolben family

In August 1940, Emil's beloved wife Malvína died. She died at the age of 77 and was thus spared the subsequent humiliating events and the tragedy the family suffered. At first, the industrialist's influence still showed results; the Kolbens figured among forty families who were awarded "honorary arianship". This meant that the family did not have to wear the humiliating

David's star on their clothing, they were able to further go to restaurants, cafés, parks and other places that Jews were already forbidden to enter, just as they were allowed to use public transport. Yet this protection was very fragile, and the family was well aware of it. When Reinhard Heydrich became deputy imperial protector (September 1941), any seemingly provided privileges to any Jews ceased to exist without exception. By official order, Emil was deprived of his honorary citizenship of Strančice, and in November, the authorities banned his grandchildren from studying; and in the spring of the following year, Vilém Lieder-Kolben (Lily Kolben's husband) and his son Harry Kolben were deported to a concentration camp, just as Emil's second grandson Hanuš-Werner. Facing the hopeless vision of the days to come, Emil's siblings Kamila and Alfred committed suicide in their hometown in Strančice. *"It was like living above a volcano, constantly anticipating the things to come – evil, worse and the worst."* Emil's grandson Jindřich Kolben, one of the few people pertaining to the narrower circle of the Prague Kolben family branch who survived the war, wrote the following after the war. *"My father and I had discussed all the threats a long time ago including whether there was an option to escape or not. Considering my grandfather's uncertain fate, we decided to stay."*

Finally, in 1943, fate struck even the last single members of the Kolben family, Emil, his daughter Lily, the former PRAKAB director Hanuš and grandson Jindřich. The latter captured these days in his book *Příběh rodiny Kolbenů* (*The story of the Kolben family*): *"The fateful day of 6 June 1943 arrived. My grandfather, aged 81, was carried out by SS members on stretchers. They were disguised as caregivers so as not to attract public attention. According to my half-sister's testimony, who was watching this violent act, my grandfather cursed the Nazis at that moment."*

They were brought together with others to the transport assembly site at the Trade Fair Palace. *"While being taken to the Prague-Bubny freight station, a Praga RN truck bearing the company inscription "Pražská továrna na káble" (Prague Cable Factory) flashed past our sad procession, and our faithful driver, Mr. Václav Vaník, blinked at us encouragingly. No one would believe how such a friendly expression encourages you when you're in misery."*

The humiliation of one of the greatest industrialists continued: *"Prior to boarding the train, dressed in a winter coat with a fur liner though it was June and wearing an Eden hat, SS officers took away his small black briefcase with a package*



Construction of other production halls







of ČKD shares inside. I watched this from one of the cars in the transport train we had to board. When we arrived at our destination in the evening waiting in the basement of the Terezín bastions, he was leaning on me and not talking. Then they separated us and we were in different barracks.”

The Kolbens met briefly again in Terezín; the artistically talented Hanuš-Werner wrote poems here, thanks to which he appears in several Terezín poet anthologies along with Ilse Blumenthal-Weiß, Ilse Weberová, Kurt Geron, Leo Strauß and Georg Kafka, a distant relative of Franz Kafka. Despite being young, Hanuš-Werner also gave lectures on literature, as the University of Terezín secretly operated at the camp, and despite the ban on education, many inconspicuous lectures took place here. This resulted in such situations while peeling potatoes, for example, informed discussions were led on the Renaissance, philosophy, music and literature, in which Hanuš-Werner Kolben was actively involved. He may have also met Arnošt Lustig, who briefly mentions him in his prose “Porgess” from the concentration camp. Being a prisoner, Hanuš-Werner subsequently worked in the Kauffering quarry in Bavaria where, according to witnesses, he quoted Goethe and Rilke’s verses while working. *“Anyone hearing Kolben freely recite his own or other people’s verses in a broken, still, almost boyish voice had no doubt that this huge-handed clumsy boy with big beautiful eyes was born to become a poet.”* Hans Günther Adler, a prominent German scientist and writer, wrote about it. It was in Kauffering where Hanuš-Werner finally contracted typhoid fever, of which he died in 1945. For the sake of completeness, we should add that – though it’s not of essential importance – he did not profess Judaism, he professed Lutheranism. All of Kolben’s children and his grandchildren were baptized.

After a few months, the elder Hanuš and his second son Jindřich were deported to Auschwitz. The former director of PRAKAB kept up his a positive attitude, at least outwardly, trying to spread this around himself. In the spring of 1944, however, his health began to deteriorate given the poor conditions, and he was eventually murdered in a gas chamber in July 1944. Yet, at the time, Emil Kolben, one of the greatest industrialists of the first half of the 20th century, was no longer alive, as the old man was unable to stand the cruel regime in Terezín and died mentally and physically broken after three weeks of imprisonment and poor conditions. *“On 3 July 1943, I was called upon after work to come and see him in the Podmokly barracks, where he was already lying dead*

on an iron military bed...“ recalls Jindřich Kolben, who managed to miraculously escape at the very end of the war while working at the OHW factory, later joining General Ludvík Svoboda’s regiment in Slovakia.

The sad irony was that shortly before Emil Kolben was deported to Terezín, former PRAKAB companions, i.e. 70-year-old Henrietta Steiner, the widow of the founder of the cable company in Schwechat, as well as her sister Gisela Wiese, had been brought there as well (transport from Vienna on 1 April 1943). Former PRAKAB managing director Miss Marta Vogelová, was also murdered in the Malý Trostinec extermination camp.

A total of twenty-six Kolben family members perished in the Holocaust as a result of racial persecution. Lily, Harry and Jindřich Kolben survived the camps, but all of them left Czechoslovakia later, and a certain part of the family was scattered around the world. The famous industrialist’s descendants and relatives are now living in Australia, America and Europe. Emil Kolben’s name was presented in a contradictory manner during the socialist era, but given his tragic fate, he was not condemned as much by the press as other large-scale capitalist industrialists. From time to time, there were articles even appeared on the occasion of his anniversary, reverently commemorating his numerous merits.

On the other hand, Jindřich Kolben’s grandson suffered from bullying by the communist totalitarian regime and, just like under the Nazis, he was expelled from school, this time because of his bourgeois background. Nevertheless, he managed to return and eventually successfully complete his mechanical engineering study programme. He carried on the family tradition, albeit under the limited options offered by socialism, and he even worked briefly at ČKD, and later at the Avia engineering company and at Motorlet, becoming an esteemed expert especially in the field of aircraft engines. After the Warsaw Pact troops invaded Czechoslovakia in 1968, he emigrated with his family to Munich, where he continued his successful career. At the end of his life, he liked to return to Bohemia. He died after a fulfilled life in 2013.

PRAKAB under the swastika



A view of the factory complex with villas for employees which no longer stand today, 1940

Despite the Kolben family's tragic story, PRAKAB prospered very well during the war. The company merging with Křižík-Chaudoir and its transformation into a joint-stock company further strengthened the factory and its sales.



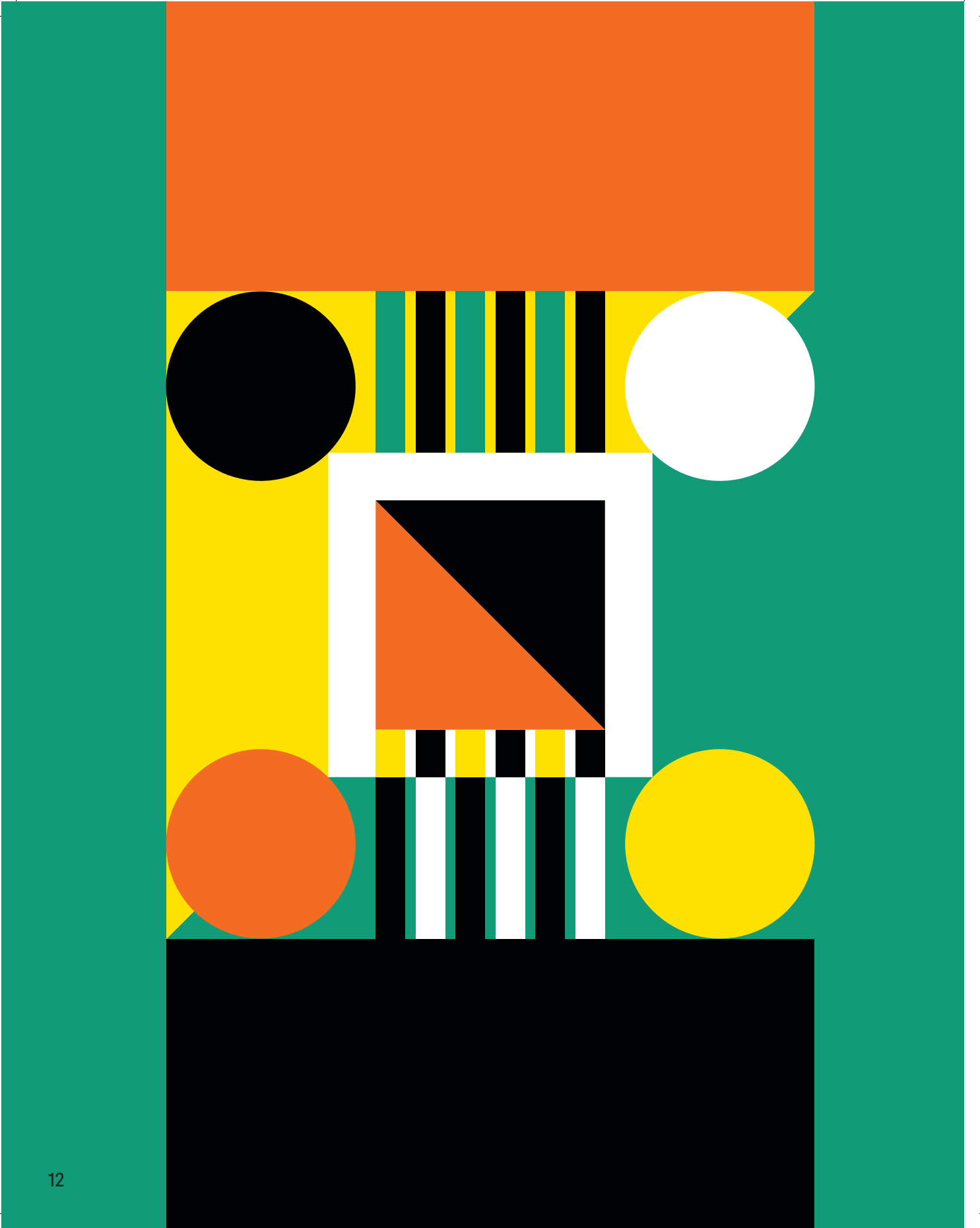
The factory with unfinished chimney, 1940

Firstly, a decision was made that the company, now named *Pražská kabelovna a.s.* (German: *Prager Kabelfabrik AG*, i.e.: Prague Cableworks), would launch a new production of power and communication (telephone) cables. This triggered a production reorganisation, e.g. enamelled cables were to be left entirely to Křížík's company (which did not happen entirely). Thanks to these production changes, a new three-aisle segmental roof hall and an acreage of almost 4,000 sqm was built in Hostivař by Ing. Václav Stieber. This project started in 1939, but it became far more complicated due to the war – it was impossible to buy the required machines, so Křížík's company made them itself in cooperation with ČKD, and the construction of the hall wasn't easy either. It was mostly built the old way with bricks, as there was not enough cement to make concrete; the ceiling trusses were partly hammered together from wood, as there was no iron. Works on the new building started on 3 June 1940. Prior to finishing the hall, the first machines arrived at the factory, a telephone laying-up machine and an insulating and a quading machine, the trial operation for manufacturing with air and paper-insulated telephone cables started on 2 December.



Roof of the new hall destroyed by the storm, 1941





On 1 January 1941 a terrible storm came, tearing the insufficiently secured trusses from the roof that was under construction and destroying several of them. The construction workers smashed together wooden sheds in the yet unfinished hall to protect the new machines, and production began in January in freezing weather, when the sheds were heated by ordinary coal-fired stoves.

At first, production had to be improvised, as Emil Buchlovský recalls: *“The core of a telephone cable was made in the new hall, moved to older buildings by rolling the drum there, dried in the old conductor impregnation stations in a boiler, and lead was pressed around. Then these products returned to the new armouring hall and went back to the old establishments to be tested.”* The production of power cables (up to 10 kV) with impregnated paper insulation was launched intermittently from 1941 onwards, but it often had to be stopped due lacking material, and a more systematic start took place in 1943.



Output control, responsible work of women

Naturally, exports declined during the war, and in some periods, materials, mostly metals (aluminium and copper) or rubber were running short. However, PRAKAB expanded both as far as construction and equipment was concerned, acquiring a new transformer station and also a new raw material warehouse, and in

1943 Vladimír Štulc's company Fumor built a new 45 m high chimney. The number of employees also grew, and in 1940 the factory had 423 employees, which later rose to 538 workers, and in 1942 the company staff increased to 605 workers and another 66 white-collars. The factory was managed by the aforementioned Vladimír Kocman, together with Ing. Emil Buchlovský, who became technical director. He came to the company with several other colleagues as specialist help from the Podmokly cableworks. Furthermore, even during the war, the factory was not entirely dependent on orders from the army, and as far as military production was concerned, it virtually only supplied field telephone cables and smaller orders for the navy (e.g. antennas for submarines).

"Furthermore, many cableworks had been destroyed due to the bombing of companies in Germany, and the demands on our company consequently became bigger and bigger. The staff was asked to work on Sundays as well, yet this was immediately rejected. Unfortunately, some were threatened to mind that they were born in 1924 and that they could be deployed to the Reich," recalls Václav Assmann, who was promoted to head of the enamel section during the war. In Berlin, the Prague Cableworks were commercially represented by Bedřich Heisel, and the company worked for the Reich by supplementing on stock orders for the Austrian cableworks named Wiener Kabel- und Metallwerke. Due to the Reich Ministry of Economy's wishes, it also became member of the Reich cartels and unions.

During the war, the company supported the German Red Cross, the Jirásek Theater in Hronov, the Božena Němcová Museum and the Children's Shelter in Krč, and it also financially supported the Small Theater in Hostivař, the local firefighters and the firefighters from Horní Měcholupy, as well as the SK Hostivař football team; on this football field, the teams set up by the local factories of Podhajský, Štěpánek, Hlavatý, Kameníček and cableworks held their matches. The company tried to meet its employees' requirements in other ways as well, such as encouraging their mood, popular artists performed here, such as famous Czech swing singer Zdena Vincíková, who performed with the legendary R.A. Dvorský Orchestra during the war. On 3 July 1940, Otakar Schimak founded a factory association called Sportovní a vzdělávací klub (Sports and Education Club), which continued until 1950, when it was abolished following a decision of the Communist Party. In 1941 a new company canteen was built, where workers were offered soups for 15 hellers, and the company additionally donated 122 pairs of new shoes, also providing a Christmas allowance.

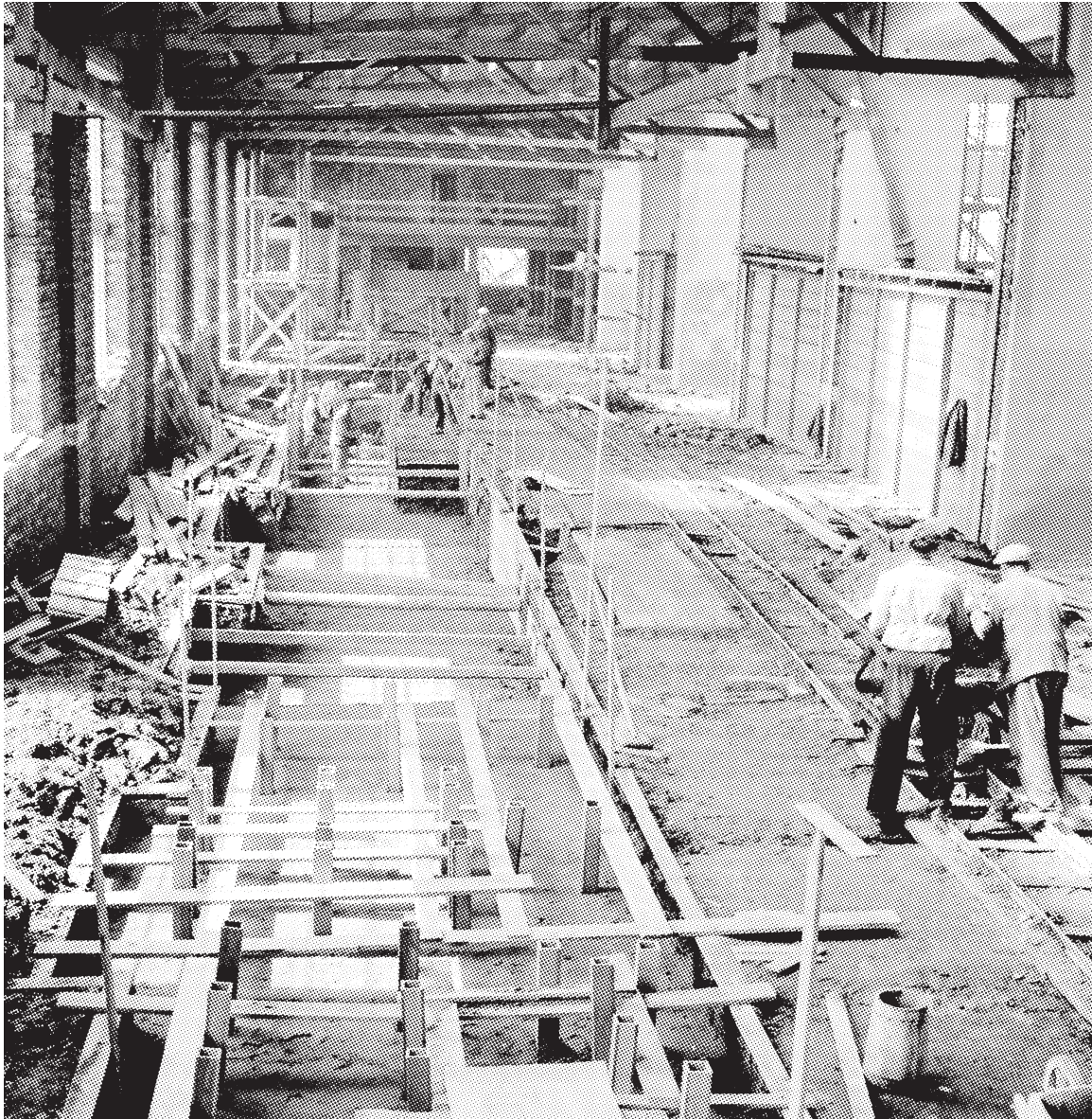


Construction of a new cable hall, 1939 – 1942



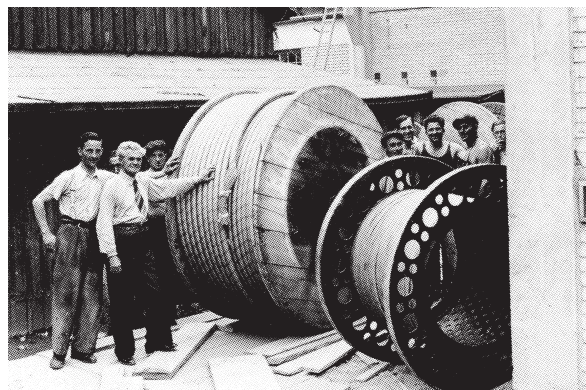






However, in comparison to the prices in the rest of the Empire, the company's income dropped and wages remained an internal problem as workers repeatedly demanded a raise, which actually happened in 1941. But the minutes from the Eleventh General Meeting (held on September 1941) say: *"The workers' wages were increased by a total of 250,000 crowns per year. Despite this, most workers are dissatisfied with their current wages. This was especially true for women, as thirty of them already left our company."*

Workers sometimes even sabotaged production, broke cables apart, damaged machines or enamelling furnaces, postponed the time for putting new machines into production, material got lost, etc. Needless to say, the workers' courage (but frequently also often carelessness) was mostly covered up by managing employees. According to Václav Assmann's testimony, Vilém Ondryasch helped the factory workers even during the war, declaring himself to be of German nationality, and he was in charge of supervising that no anti-Reich moods prevail in here. It is also possible that there were no consequences when the machines were stopped on 28 October 1939 and the staff demonstratively went on to sing the Czechoslovak anthem.



Employees held together even in difficult times, 1941

The workers stuck together. When Josef Zykán, one of the employees, was arrested by the Gestapo, other workers secretly put some money together during his imprisonment to support his family. However, not everything turned out well and during the occupation, employees Josef Bonty, Jiří Staněk and František Zika were executed (later Oldřich Kožešník, Vlastimil Nohejl and

Bohuslav Slavík also fell during the revolutionary events linked to the liberation of the republic). Their names and legacy are still commemorated by a memorial plaque.

Nationalisation

At the beginning of May 1945, the last days of the Second World War culminated in our country. On 5 May, an insurgent group led by Lieutenant Václav Dražil was formed at the Hostivař police station; a second group operated at the strategically important location near the train station under the leadership of Staff Ensign Karel Vyhnal, and yet another group was led by Jaroslav Kratochvíl. Resistance against the Nazis erupted rapidly in other places as well. Industrial factories joined this movement immediately. To be more specific, the cableworks were shut down on 4 May in the afternoon, and from 5 May the employees guarded the site until Prague had been liberated.

This resistance was definitely not just symbolic. On 6 May, fierce battles broke out on the Hostivař hill “Na Groši”, were led against a German battery of anti-aircraft cannons. There was a military transport train with hundreds of German soldiers that got stuck at the railway station near Horní Měcholupy, but there was fortunately no massacre and these soldiers eventually left the area that is Prague 15 today without a single shot fired. Heavy fighting took place on 7 May for the nearby Českobrodská road, where the Germans had been more successful at first. On 9 May, the Soviet Red Army arrived in Hostivař, breaking the last remnants of German resistance. The war was definitely over, Czechoslovakia was united and free again. But it was not in for peaceful times.

Europe wasn't and also would not be as it was before the war. Our country started to feel this very soon, and it was the industrial sphere where changes turned out to be very significant, as the first nationalisation wave broke out immediately after the war, which also affected the entire Křižík company, and the Hostivař cableworks as well. At this point, we have to make a brief stop. Despite the widespread misconception, the first waves of nationalising enterprises did not arise from pressure exerted by the Communist Party, but they were backed across the political spectrum. The political representation led by Edvard Beneš was already anticipating them during the war, and as far as the concept (and scope), they resembled similar acts like those in

France or Great Britain rather than the radical Soviet Union. The nationalisation of industry was further specified in the Košice government programme from April 1945, and it became very tangible with the decrees subsequently issued by the President of the Republic, Eduard Beneš. During the first post-war months, the Communists themselves proclaimed that they only intended to carry out partial nationalisation and advocated that nationalised land be distributed among small farmers, guaranteeing private ownership of the land – an idea they abandoned altogether after taking over political power (and ideologically abused some of Beneš's decrees).

In the first wave, the decrees were to confiscate property (taking it over without compensation) of German and Hungarian citizens, as well as property that pertained to Czech collaborators. At the same time, the government decided that the national administrations would be in charge of managing large, mostly industrial companies (as well as mines, film companies, joint-stock banks, etc.). Everything went very quickly, and by September 1945 there were already over 9,000 national administrated companies, which usually meant that they were nationalised subsequently. We have to state, that unless the cases referred to collaborators, German or Hungarian citizens, the state didn't confiscate companies, the property was nationalised from the owners to make up for damages, which were to correspond to the price of the property. In the case of large industrial enterprises, which were of fundamental importance to the liberated country's economy, the ministers of industry and finance felt the respective decisions on compensating damages in person. The value was to be paid in state guaranteed securities, in cash or otherwise; however, given the subsequent political and economic situation, the owners didn't get any compensation (or only in negligible cases). Any hopes were definitely buried by the drastic monetary reform in 1953, which sought to avert (or rather mask) the state's bankruptcy.

Due to these fundamental interventions in private property, both the hitherto and pre-war ownership structure changed quite significantly. In 1946, the state-owned sector controlled up to 70% of all industry, with the rest provided by cooperatives or private entrepreneurs, who mostly survived in small and medium-sized industries (in 1946, only slightly less than 15,000 industrial enterprises which had not been nationalized remained). All this happened before Victorious February, when the totalitarian communist regime got hold of power, liquidating private enterprises despite the declarations it had made regarding them.

However, in 1946 all parties, including the Communists, agreed that the nationalisation process had been successfully completed, and in October a two-year economic plan was adopted to bring the country back to its pre-war level. It was characterised by the Communist Party's ever-growing power (with the social democracy movement, mostly associated with nationalisation losing power on the other hand), and the preparations it made in order take over total control.

The works councils therefore took over Křižík's enterprises immediately after the liberation of the country and it was decided to nationalize them, specifically by a decree of the President of the Republic dated 24 October 1945. The company was swept right by the first wave like other important companies such as ČKD, Škoda's plants, Aero, Avia, Poldina huť (Poldi metallurgical works) and others (in Hostivař, this true of Kovové a hutnické závody (Metal and Metallurgical Works), to strojírny Otakara Podhajského i Jiřího Kameníčka (Otakar Podhajský's and Jiří Kameníček's engineering works), or to František Štěpánek's shoe factory. At first, K. Rieger was entrusted with national administration of the cableworks, and then an expert named Jan Hrdlička, who had worked here since the company's establishment, was elected head of the factory, and Josef Zykán was the chairman of the company's works council. However, the connection with Křižík's name was immediately disrupted as all nationalised cable companies (Hostivař, Bratislava, Kladno, Podmokly, Vrchlabí, Vsetín and Topolčany) were united under a single national enterprise named Kablo, and this was done by a decree of 7 March 1946 (retroactively as of 1 January). The General Headquarters were in Bratislava. This union also included factories for insulating pipes, the Prague-based electroinsulation works Pražské elektroizolační, and several companies producing insulating materials. Kablo's main Prague branch was on Na Poříčí Street – house no. 5, and the former Isomat cartel store remained in operation as well.



National enterprise Kablo Hostivař, 1946

Taking this form, the company, now called Kabelovna Hostivař or Kablo Hostivař, participated in renewing the country as part of the post-war two-year plan. Linking the production with other cableworks triggered a change in the production programme, the production of power and telephone cables was cancelled and, on the contrary, the production of residential area cables, enamelled or dynamic wires was extended. The company extended its Hostivař-based facilities by the buildings pertaining to Antonín Hruška's company (bookbinding, graphic and cardboard machines), where it set up auxiliary warehouses (in Za Drahou Street no. 222), and by the confiscated premises of the German company Rheinmetall, which produced calculating machines here during the war. Its factory halls were nearby, parallel to today's Průmyslová Street (roughly congruent with the floor plan of today's house with no. 1428). PRAKAB adapted these premises to offices, an operating accounting office, a canteen with a kitchen, a library and a club room, and the production of braided enamelled and dynamic wires was also transferred to this place. In February 1948, constructor Václav Stieber completed a new warehouse for enamel varnishes and oils.



First cable delivery to the USSR, 1946



Celebrating the shipment of 30 kilometers of cables to the Soviet Union, 1946



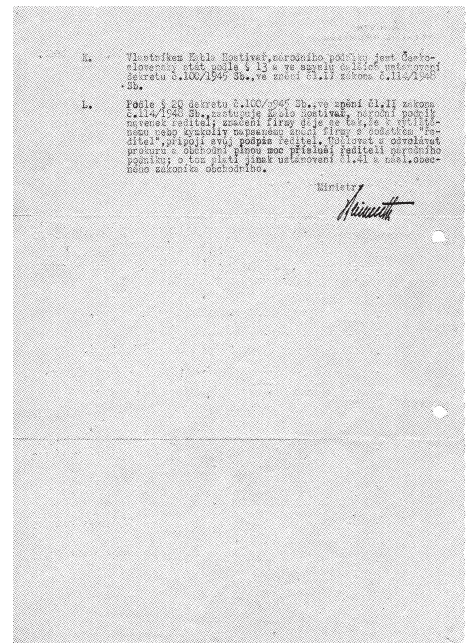
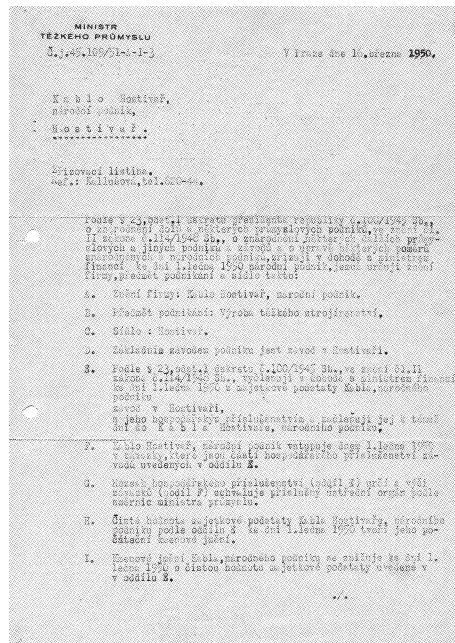
The company made headlines shortly after its one-year anniversary of the liberation, when it sent eight wagons carrying thirty kilometres of cables to the Soviet Union on 24 May 1946. The ceremonial handover was attended by the Soviet business attaché Pavlov, as well as by the parliamentary member and future president Antonín Zápotocký, with whom the female workers were keen on getting photographed with. On this occasion, the factory boasted having increased production in comparison with pre-war production levels by 200%, and journalists soaringly described the friendly atmosphere in the company in line with building a society of socialism, which was to sound in the upcoming years. *“Everything each and every worker cares for here is that the plant prospers, and that’s why the factory is gaining strength, why work moral is solidified, which in turn boosts its productivity,”* wrote

Jan Slavík, a long-time employee, in July 1947 in the seventh issue of Kablo noviny written by the group's employees.

We are entering the time of socialist competitions, part-time aids, union organizations, socialist personnel assessments, the time of shock-workers and comrades.

Building socialism and standing on your own two feet

The connection of the cableworks managed by the Bratislava general headquarters didn't last long, and in 1950 the group was decentralised again. The enterprises became independent, and the Hostivař company regained its independence as *Kablo Hostivař, národní podnik* (*Kablo Hostivař, a national enterprise*). According to a decree issued by the Minister of Industry Augustin Kliment of May 1950, it was established retroactively as of 1 January 1950. Jan Hrdlička, an expert we've mentioned several times and a long-term employee, was entrusted with the management of the factory.



Deed of Foundation of the Kablo Hostivař company, 1950

Born on 20 December 1900 in Vienna, his father worked on the railway as a stoker. Jan attended high school in the Austrian capital, continuing in the town then known under the name Gorica, Austria (today in Italy); he graduated from an industrial college focusing on electrical engineering, this time in Vienna again and in České Budějovice. Having completed his studies, he went to Prague, where he was employed in Kolben's branch of the Schwechat cableworks located in the Prague-Vysočany based brewery area, and thus became part of the company in its very beginning, which meant he also witnessed the company moving to Hostivař. From 1923, he worked as the plant engineer; he then became head of operations, and before the end of the war he practically took over management, which was then confirmed by the post-war national administration authority. He remained head of the factory even after the February coup d'état, and in 1956 he was at last officially appointed director of the plant, with Vojtěch Křížek becoming his deputy.

In May 1948, Jan Hrdlička and his colleague František Lippert established their own association within the company, i.e. *Hasičský sbor v továrně Kablo (Kablo factory Fire Brigade)*, but the time didn't quite hold dear practical associations, which is why the fire brigade was dissolved three years later in July 1951.

The independence the factory had acquired helped it have a new building approved – an administrative and social building, which still serves its purpose until today. The project was designed in August 1950 by the SOP plant from the SOP Československé stavební závody (Czechoslovak Construction Works). The area with an acreage of eight and a half thousand square meters harboured the company's offices, as well as changing rooms, washrooms, sanitary facilities, a company kitchen, a dining room, a bar with a beer cellar, shared lounges and a new gatehouse.

With the acquisition of a new area, part of the space confiscated from Rheinmetall lost was no longer necessary, and the factory eventually found an entirely different way to use it – it was freed up for the needs of the newly established kindergarten, which was only the second kindergarten in the Hostivař district (the cable company held patronage over both). It was primarily intended for children of parents employed by the company, so the cable company welcomed the request by the People's Administration, which launched a plan to establish a new kindergarten in each Prague district that would be operated during the entire week, due to the lack of kindergartens. Consequently, in some parts of Prague these kindergartens were set up directly at industrial plants so that working mothers had a place where

their children would be taken care of. The premises near the Kablo facility were adapted as part of activities carried out voluntarily by the company's employees, and the plant's in-house kindergarten became the first of its kind in Prague. Readers may wonder whether it is safe to place a kindergarten on factory premises, but we can still see this today. Additionally, the former Rheinmetall building was not in the main workshop area. Today it is the busy Průmyslová Street, but at the time there were still (to the West) mostly fields, so the children didn't come near the machines or the sidings of the cable company at all. Despite the original intention, the kindergarten was not only for cableworks employees, it also helped parents of children from surrounding factories.

From time to time, these Hostivař factories underwent changes in the new world of socialism, and gradually, all of them were. Some only underwent ownership changes, whereas others vacated their premises for other industries upon official decisions. As far as the immediate vicinity of the railway is concerned, the state-owned enterprise *TOS Hostivař* was established by merging the Podhajský and Kameníček Engineering Works, an experimental nuclear physics laboratory with the first nuclear accelerator in our country was established in a part of film studios in the early 1950s. Štěpánek's shoe company was transformed into *Obus*, but the premises were soon taken over by the Mladá Boleslav Škoda carmaker. Instead of Petzold's warehouses (the former glassworks), the *Kovona* company was established, Viktor Röhl's family business became *Pérovna Hostivař*, Matern's paint factory became part of *Pragolak* and was subsequently integrated into *Barvy a laky (Paints and varnishes)*, and Fragner's pharmaceutical company became *Spofa*. During the 1960s, *Kovošrot (Scrap metal facility)* was established here, and the Zdražil buildings located directly opposite the cableworks were partially taken over by *Stavební komunální podnik (Municipal construction company)* for concrete products and partially by *Kovolis*; since 1955, *Vodotechna (Waterworks)*, i.e. today's *Pražské vodovody a kanalizace (Prague water and sewerage works company)*. The original buildings were demolished and new ones were built at the turn of the 1960s. And it was the latter company that helped the cableworks solve the fish poisoning affair in the early 1950s.

In January 1950, the fauna in the Kyjský rybník pond suffered a massive mortality catastrophe, which was investigated in the summer of the same year; however, the same happened again in March 1951, despite some recommendations. The commission established to investigate the case stated that the pond had

been poisoned by wastewater from the Hostivař factories, and the cable factory figured among the suspects. The commission found an outflow at TOS Hostivař, namely a liquid *“that had a milky appearance and smelled of organic fats”*; nevertheless, a company representative denied the allegations, saying the factory only drains water from washrooms. In contrast to this, Spofa responded by stating that the wastewater discharged by them contains so many chemicals that they can only be disposed of at a sewerage plant. It has to be said that the cable company was the only local enterprise to immediately address the problem and, in cooperation with Vodotechna and the Stavoprojekt construction company, it had a sump built for treating its wastewater, although the problems lasted until the mid-1960s.



Apprenticeship exams, the diploma is handed over by the director of the cable company Ing. Emil Buchlovský

Of course, this affair didn't hamper the plant's operation itself. The lack of staff posed a more significant problem. Contemporary advertising attracted new workers with a relatively long motivational text printed in newspapers. *“All you need is desire to work,”* as Svět práce (*The World of Labour*) magazine wrote in January 1950. *“In the wire drawing hall, you will learn how to drawn copper wires from thick diameters down to a diameter the thickness of a hair. Mastering your work perfectly, you will receive the opportunity to learn how to apply special insulating varnishes to the drawn wires in the enamel shop, which will result in enamelled wire after the heating process. Or if you are a radio amateur and would like to learn how to make high-frequency cables, you will get to work with the braiding machine, where you will see how the enamelled wires are braided with fabrics.*

If you are interested in motor wiring, you can also work at our rubber facility, where you will learn about the production of all types of rubber wires, or the wire braiding hall, where you'll braid many of them with appealing patterns of various textiles. Are you fascinated by telephones? Come help us make all kinds of cables for PBX equipment. And if you finally acquire the necessary expertise and show passion for the organization, there are plenty of vacancies at the plant for capable planners and designers. Free people have the opportunity to live in a recently built dormitory, and meals are provided in the company canteen." And the article even adds in its building socialism enthusiasm: *"And without realizing it, the busy life at the plant will draw you into its relatively large circle of Stakhanovites, who boast a 174% plant performance during the last shock week."*

The cableworks kept up their operation and focus, local telephone cables with air insulation were produced here again, signal cable production was moved from Kladno to Hostivař, shielded conductors with lead sheaths were transferred to this site from Děčín, a new enamelling facility with a vertical enamel furnace was added, the drawing hall was expanded, an annealing plant was purchased and a silo for producing rubber and plastics was added. The cableworks provided several housing estates for its employees on Herbenova Street (no. 723, 724, 725 or 729). The company kept growing, expanding and prospering. One thing became clear – political systems kept changing in our country, but whether the country was ruled by capitalists, Nazis or communists, they all simply needed quality cables.

Nevertheless, we cannot say that the change in the political system had not taken its toll regarding the operation of the Hostivař factory. During the 1950s communist power consolidated and political processes and personnel purges went hand in hand with it. Very often, high-ranking positions were occupied not by professionals with expertise in the field, but by workers loyal to the regime, who frequently had very little education in the field (or even lacked any education). The cableworks thus unfortunately lost several experts and some important posts were occupied by entirely inexperienced people. Following several years of operation, these deficiencies began to come to the surface, and the cable company did not fulfil the assigned plans. When M. Sedláček wrote a publication on the plant's history in the early 1960s, he stated that at the time that the company suffered from insufficient experts in leading positions: *"Assessing the causes of economic failures, it has been discovered at the end of 1957 that an entire third*

of economic and technical workers had only basic education (primary school). This situation was addressed by frequent reorganizations; the enamel works manager was replaced nine times between 1950 and 1958 without finding one (candidate) who met all the requirements.” Furthermore, at the time the centrally managed economy suffered from shortages; the technological devices used by the company became obsolete, but the enterprise didn’t get new ones. According to Sedláček, the cable company was also clogged with manufacturing “A wide and diverse product range, which has accumulated over the years, containing a large number of small-series as well as atypical products.”

Leisure time

The fifties: on the dark side of the history book chapters of the time were political processes, brutal interrogations, disproportionate imprisonments for any criticism of the newly established dictatorship, forced labour in mines, media censorship, liquidation of entrepreneurs, culture serving the regime... On the other side, there was the seemingly happy world of socialism presented in meetings, on posters, leaflets, in the press, on the radio, in regular weekly magazines. The worker was no longer to be exploited, he was to become his own master, to be as well off as the former bourgeoisie. Nothing was more far from the truth.

However, the party’s receiving support from the proletariat could not rely purely on force. Workers actually enjoyed some benefits. One novelty in the 1950s that became very popular were corporate holidays, when plants rented, bought or built holiday cottages in the mountains and in attractive locations in nature providing for lots of leisure activities. The Kabelovna Hostivař cableworks first started running such a facility in the Jetřichovice centre near Děčín in 1952. Here, it rented a former hotel, renovated it with its own resources and on its own. This resulted in a recreational building with sixteen rooms, a communal lounge and a kitchen. People were very interested in this type of holiday, and during the holidays, several hundred employees from the plant took turns staying here.

Although the hotel was in a beautiful location offering swimming and excursion opportunities, the cableworks continued to look for a better property, as the building was not sufficiently heated, so it could not be used in winter, and it was located right



Pictures of PRAKAB employees over the years







next to farm barns, filling the area with a characteristic odour. Nevertheless, the cableworks employees continued to use the facility until 1958. Meanwhile, the company provided for another house for summer and winter holidays, which was located in the mountain village of Kořenov near Jablonec nad Nisou. Once again, the company adapted a large cottage (a former merchant's house confiscated from a German family), turning it into a recreational facility and using it for many years.

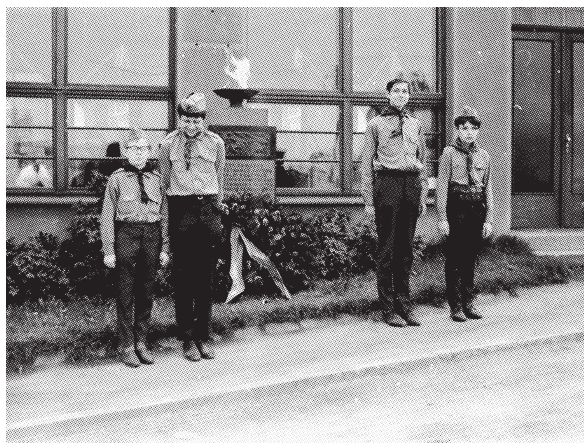
Another activity the cableworks sponsored were sports. Firstly, it still had its own football team. The team mostly competed with other factory teams, and in addition to football, table tennis was the most popular at the cableworks. In 1949, a local Sokol group was established as well, which regularly visited the Hostivař-based Sokol-gym to exercise. The factory also had its own music group, where annual balls and dances were held, and sometimes singers, bands or theatre associations came to entertain the employees (the famous Czech Semafor theatre performed for the workers, for example). It is a curiosity that after the war, the First Republic silver screen star, Věra Ferbasová, also had to improve her so-called character reference at the cable company as a worker. In a fabricated trial against her husband Josef Pálka (for having allegedly planned an illegal escape abroad), she was accused and sentenced to forced labour in Valdice (and she was subsequently employed at the cableworks).

The company tried to be forthcoming, offering its employees a leisure programme. The Kablo-based Svazarm organization held motocross races in places not yet flooded by the Hostivař reservoir; the cable company went on bus trips to castles and chateaus, to Babiččino údolí where the plot of Božena Němcová's famous book *Babička* takes place, to the trade fair in Brno and to Slovakia, as well as ordinary trips to forests to collect mushrooms. In the late 1960s, employees furthermore began going on organized trade union trips abroad to the sea, which were, of course, heading to the east to befriended socialist countries (tent camps in Bulgaria, Yugoslavia and Romania were among the destinations). Children were able to spend the summer in so-called pioneer camps, and the company also organized special tours for pensioners.

Kablo Kladno



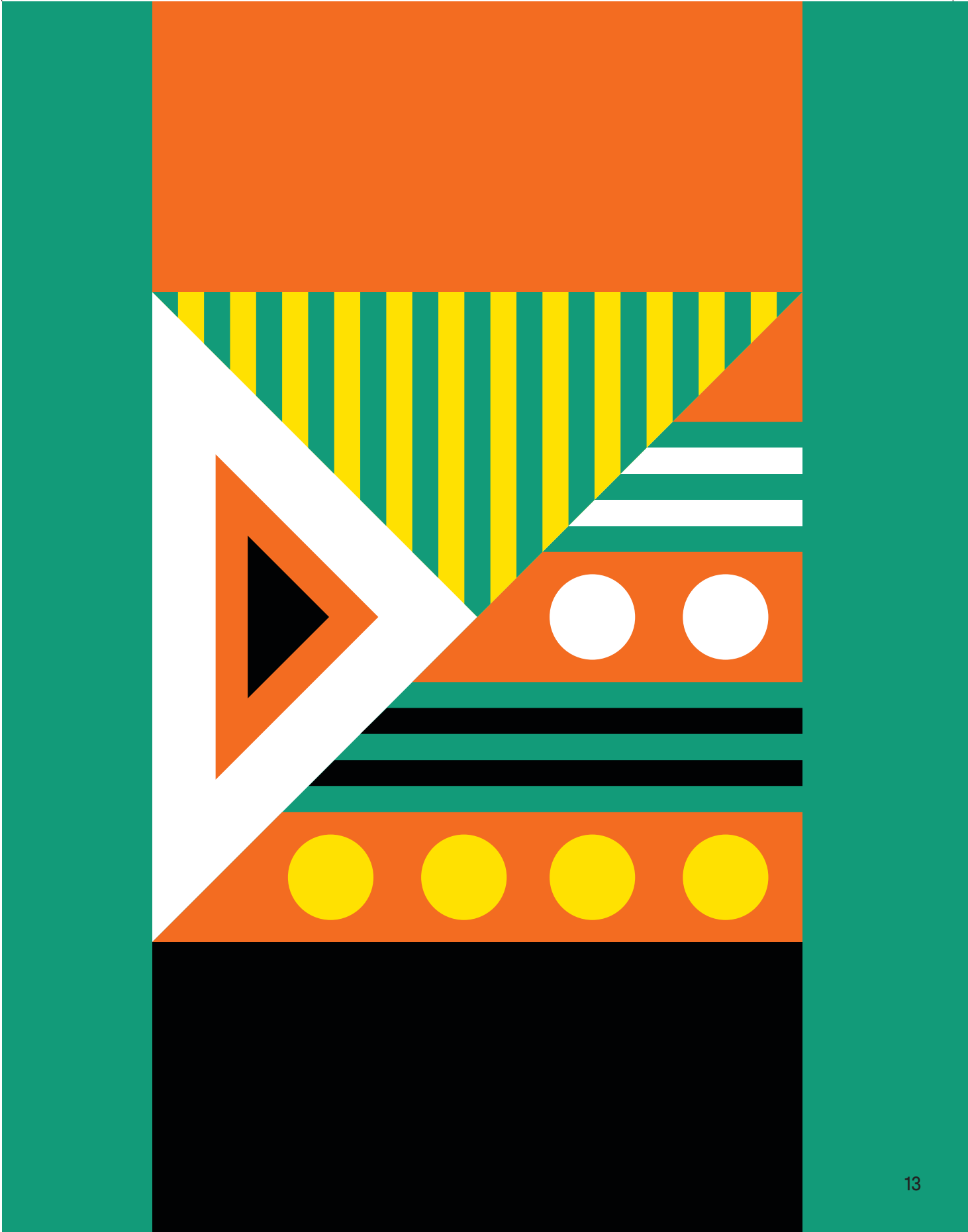
60s – integration into the national enterprise Kablo Kladno



Pioneers in Kablo Hostivař, 1970

In 1958, Jan Hrdlička, the director at the time, suffered a third heart attack and retired. For many years, his post was taken over by another expert who had worked in the company during the war, namely Ing. Emil Buchlovský. It was a rare interplay of circumstances, where a person was elected who not only knew well how the company worked, he was also one of its cordial employees. It is not without interest that Emil Buchlovský was not a Communist Party member, yet he kept running the company until the mid-1970s.

“In my opinion, posing questions about a person’s character, morals and personal qualities have to be one of the things we do ourselves when appointing one or another employee to a senior position. First and foremost, the workers themselves will very sensitively and mostly also precisely see whether he is a careerist or a person whose words are always followed by deeds.” he said in an interview with the Czech weekly Tvorba (Making) in 1972. Buchlovský wrote professional articles for electrical engineering journals Slaboproudý obzor (Low Voltage Horizon), Elektrotechnik (Electrotechnician), publications and textbooks such as *Kabely a vodiče (Cables and conductors)*, 1956; *Příručka silnoproudé elektrotechniky (Heavy current electrical engineering handbook)*, 1961; *Výroba kabelů a vodičů (Manufacturing cables and wires)*, 1986). He was known for his human approach and for educating his own experts; he was clearly “old school”: *“At one time, we started talking about the assistants*





system. These are young people assigned to posts where they can work directly with an experienced leader, absorbing his valuable experience on a virtually daily basis. I don't think it was a wrong form of work. Let's think about the options that would arise from applying it." he proposed in 1972.



Kablo's customers included television and the Prague airport



With the Soviet Union forever

On 1 April 1958, the company lost its independence again. The Minister of Heavy Industry, Josef Reitmajer, decided that this time (together with the cableworks in Děčín, Velké Meziříčí, Vrchlabí and Elektroisola Kolín) it would be incorporated into the state-owned enterprise Kablo Kladno, led by Bohumil Sivera. This brought by a further assortment change, which was now incorporated in the assortment of the Kladno Group, and the plant was integrated into the economic unit *Sdružení závodů silnoproudé elektrotechniky* (*Heavy Current Electrical Engineering Plants Association*). Back then, the production program consisted of braided dynamo wires, bare and braided enamelled wires, conductors and power cables with rubber insulation, short distance connection communication cables, hose conductors, brush wires, connecting conductors, etc. The company also established cooperation with the Czechoslovak Television, for which it supplied special camera cables; it also produced radio or airport cables and participated in lighting Prague with neon signs at night. Some of the products were also exported abroad, especially to Eastern Bloc countries, which primarily meant to the Soviet Union, of course.

This socialist economy role model triggered many local researches, some of which are truly bizarre from today's point of view. In the 1960s an experiment was conducted at our cableworks by the *Ústav pro výzkum výživy lidu (Institute for the Nutrition Research of the People)*, which was built in Krč just based on the Soviet model. It consisted in the fact that night shift workers received cold meals during one week and hot during another (this time in a more comfortable environment and made with quality ingredients). The experiment showed that a better-fed worker who receives hot meals works better, is more prompt and overall satisfied. Now this conclusion is indeed very surprising.

Invasion in 1968

The cableworks area is located on the border of the cadastres of Hostivař and Dolní Měcholupy, which meant the factory was literally lying on the very border of Prague for many years. In 1968, however, further surrounding villages became part of Prague, including the neighbouring villages Dolní and Horní Měcholupy, and the city border was moved away.

However, in our country the year of 1968 is first and foremost associated with the Prague Spring and the subsequent events in August. On August 21, the Warsaw Pact armies' tanks invaded Prague and all strategic cities, the reformist members of the Czechoslovak Communist government leadership were taken to an unknown location and it was not clear at all whether they were alive. Television resisted for a while, and radio resisted longer. There was enormous tension, and the number of wounded and dead kept rising. The war was still fresh in people's minds.



After the August 1968 invasion, employees wrote a petition in support of our government



Factory yard with siding 1960s

The invasion by the predominantly Soviet troops significantly downscaled the country's sovereignty; political members were taken away and even had to officially accept the invasion, which clearly showed that Moscow was still dominating and would continue to do so in the Eastern European bloc. The entire world watched the events in our country live, but the situation too closely resembled the situation in 1938. The Czech David was unable to evenly oppose the Soviet Goliath, and despite the world's rejecting the invasion, we did not have an ally to significantly interfere with the course of events. National confidence suffered another humiliating blow.

The entire country experienced the events intensively, and the Hostivař cableworks were naturally no exception. On August 28, just one week after the invasion, the company sent a letter to the government of the republic, to the party presidency, and the entire National Assembly signed by 540 employees of the plant's morning shift, who unanimously rejected the invasion (followed by the afternoon and night shift signatures). *"We insist that the occupation forces depart immediately; they have grossly trampled on our freedoms and affected both the thinking and feelings of the entire nation. We demand that all damages caused by the occupiers in our territory be speedily compensated, even though it will never and cannot possibly compensate or replace the lives of our innocently murdered children and citizens! We express our fundamental disagreement with the communiqué signed at the end of the negotiations in Moscow. We will never accept the Moscow dictate! Believe us, we believe you!"* In December, a Hostivař Kablo cableworks delegation paid a visit to Josef Smrkovský who, alongside Alexander Dubček, was one of the most visible Prague Spring political representatives, expressing the entire plant's support for him and the government.

However, the Soviet Union put through its will; the troops settled in the country for the next two decades, and with considerable help by Communist Party careerists, the two decades in Czechoslovakia currently referred to as normalization started. If the liberal 1960s had managed to make the people feel communism could be the right way forward following the dark 1950s, the August events definitely crushed them. The last ideals were lost with the "live torch", Jan Palach, in January 1969.

Despite the tragic situation, the cableworks managed like it had so many times before to overcome the historical events, and the factory machines kept on winding new cables on their drums. After all, it was 1968, the year that went down in the history of our

cableworks as the year of the construction of further new halls on a respectable area of eight thousand square meters. Another six new spacious buildings were gradually added with separate production lines by the end of the 1980s.

Life in the normalization era

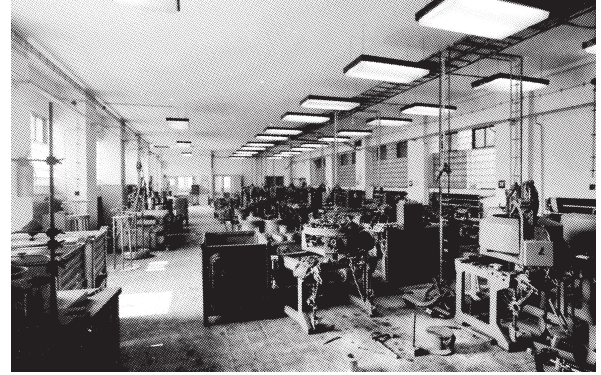


Office building, 1971



Logo detail, 1971

In April 1969, a fire broke out in the cableworks, but fortunately only the wooden employee dormitories succumbed to it. In 1971, the factory celebrated its fiftieth anniversary, published a brochure about its history on this occasion and of course, big words were spoken. Let's hear a bit of the spirit of the time... *"Following the liberation in 1945, the plant's political and trade union life fully developed. The entire staff enthusiastically participated in building the socialist country. Workers accepted new forms of work en masse, supporting efforts to expand production and increase productivity. The plant received several awards and honours on various occasions. Labour commitments, socialist competition, and the improvement movement have thus become important factors in building and further developing the plant. The socialist labour brigades not only contributed to the plant's economic results, but also to establishing and strengthening good working groups."*



Since 1969, the cable company had its branch in the village of Chyše

The new plant facility also began to work properly. Upon agreement with the National Committee of the town of Chyše in the Karlovy Vary region made at the end of 1969, the cableworks opened its first subsidiary, which developed promisingly and soon became an integral part of Kablo's production. The local workshop was established in Count Lažanský's former airport hangar, to whom the local estate originally belonged and whose last descendant, Prokop, was taught privately by Karel Čapek himself (who in turn used local realities in his novel *Krakatit*). Kablo helped in improving the working conditions in the city (it mostly employed women, around sixty of which worked here in the late 1970s taking turns in two shifts); it financially contributed to the construction of a local kindergarten, and lent a truck to farmers. Low-frequency cables and cables for airborne on-board networks were produced at Chyše, and copper wires were drawn and tinned. Jozef Lokaj, an employee from this factory, kept writing to Communist Party-backed newspapers (*Rudé právo*, *Tribuna*) and to all kinds of popular magazines (*Vlasta*, *Naše rodina*) with unceasing enthusiasm to inform about the local plant and the devotion of its employees to the Communist Party, including their work for the cable company.



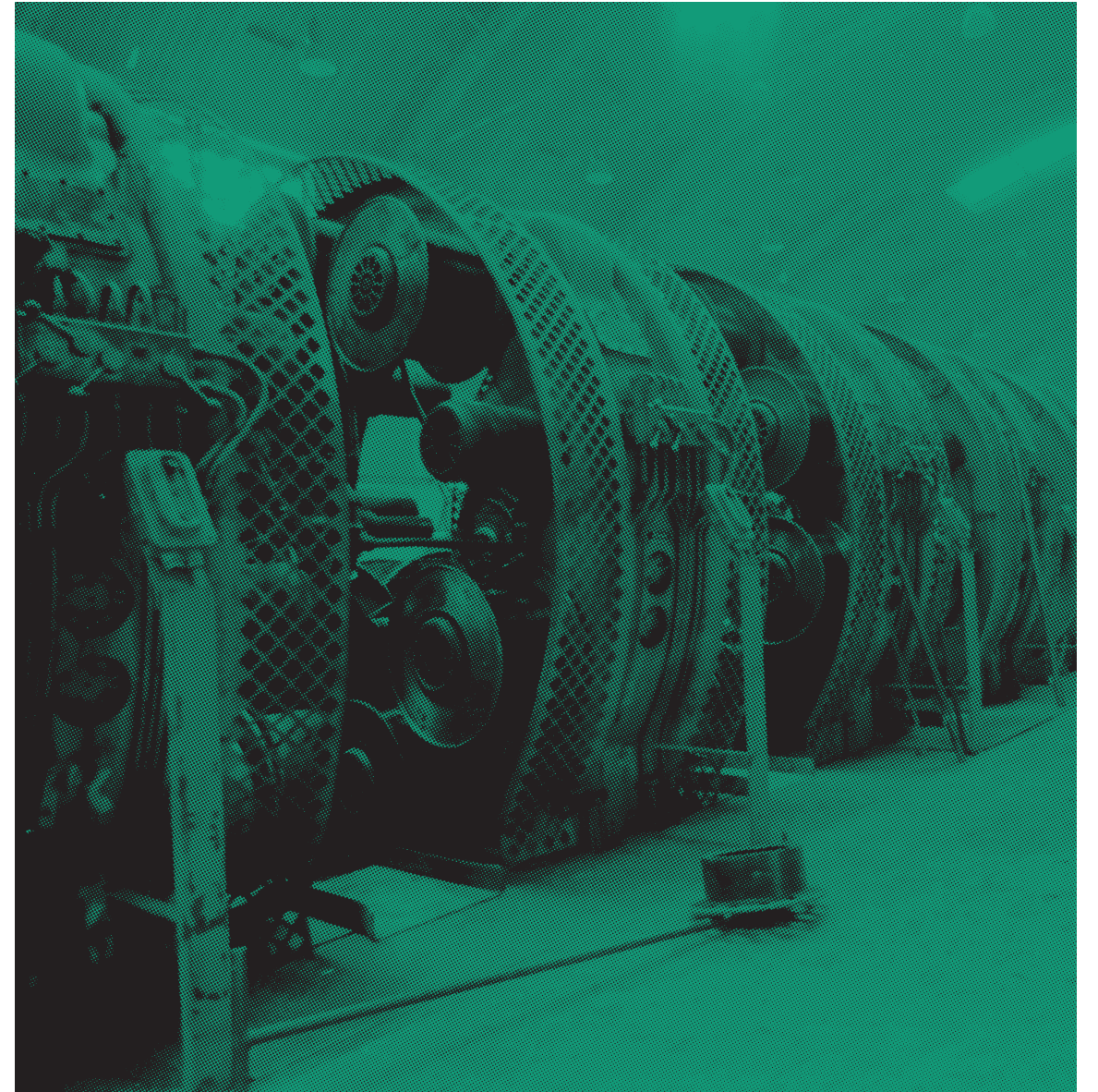
During the normalization, employees could use a recreational cottage in Kořenov

In the early 1970s, the glass-insulated copper and aluminium dynamo belt production was introduced in Hostivař. New production halls were soon added, but three employee villas built in the era of the First Republic were demolished, as they stood next to the gatehouse. The company built its own medical centre and renovated its holiday cottage in Kořenov. Generally, the turn of the 70's is marked by huge construction works in Hostivař; new housing estates and Metrostav hostels (Vltava) were built, facilities for new residents were added (swimming pool, cinema, department store), and the congested Štěrboholská road traffic was also alleviated as another artery was built, which was planned back when the factory was constructed (originally known as Podjezdová and Vstupová Streets, connected to Průmyslová since 1985 and named after it). Far, far away were the days when it was hard to get to the factory from surrounding neighbourhoods; now there were bus lines 204, 111, 115, 122, 181, and 194, with the first four of these stopping right in front of the company.

"You can detect Kablo by the smell of its characteristic insulating material fumes. To some people, this is a pleasing scent, while it is unpleasant to others, but no one can escape these fumes. They are everywhere, in the entire plant. But within in a moment, you become accustomed to them;" these were the words Vítězslav Havlíček used to begin an extensive report from the factory printed in Rudé právo on 2 February 1974. Among other



Concrete column bases of new halls, 1993



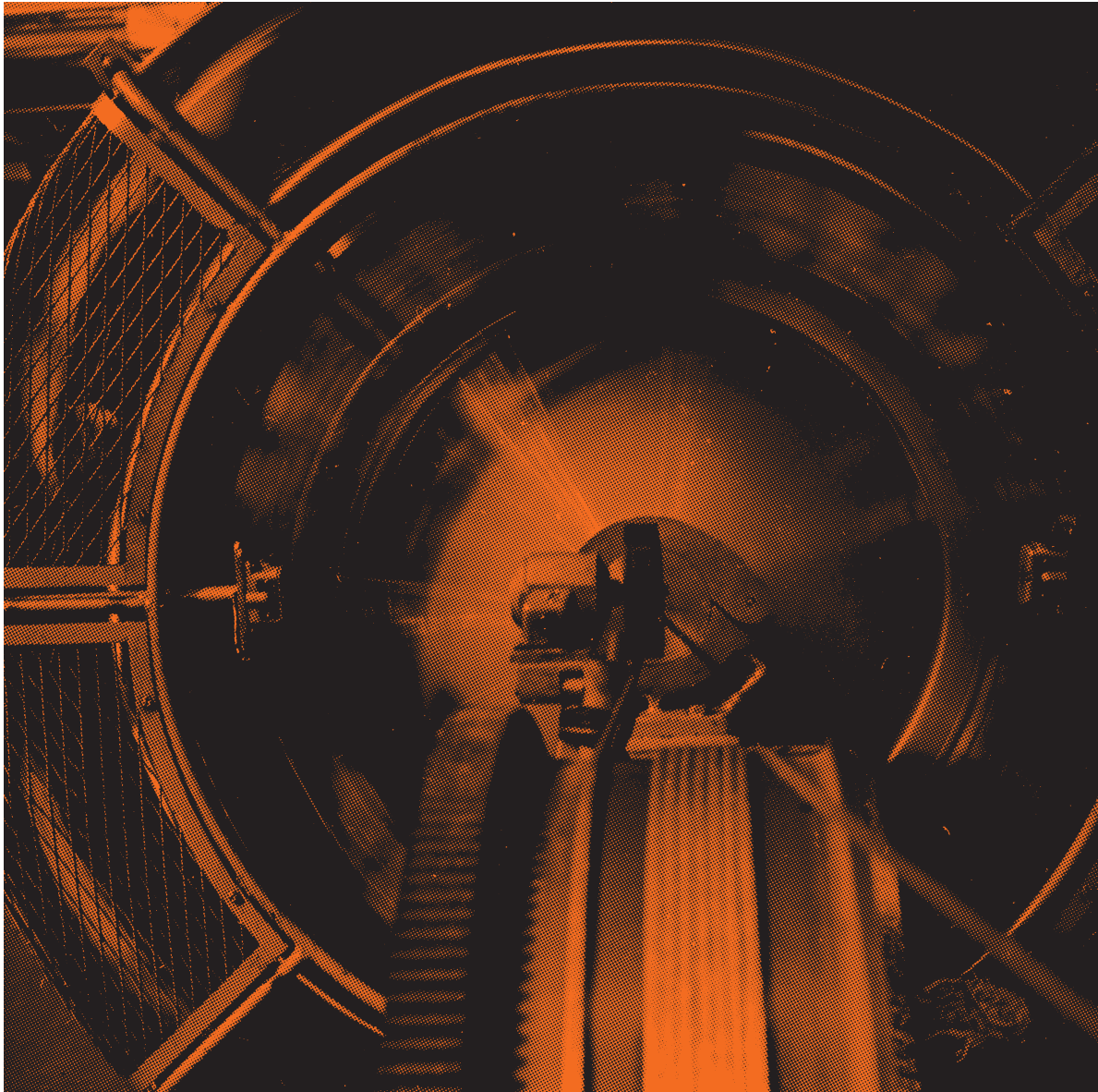
Stranding cages, 1973



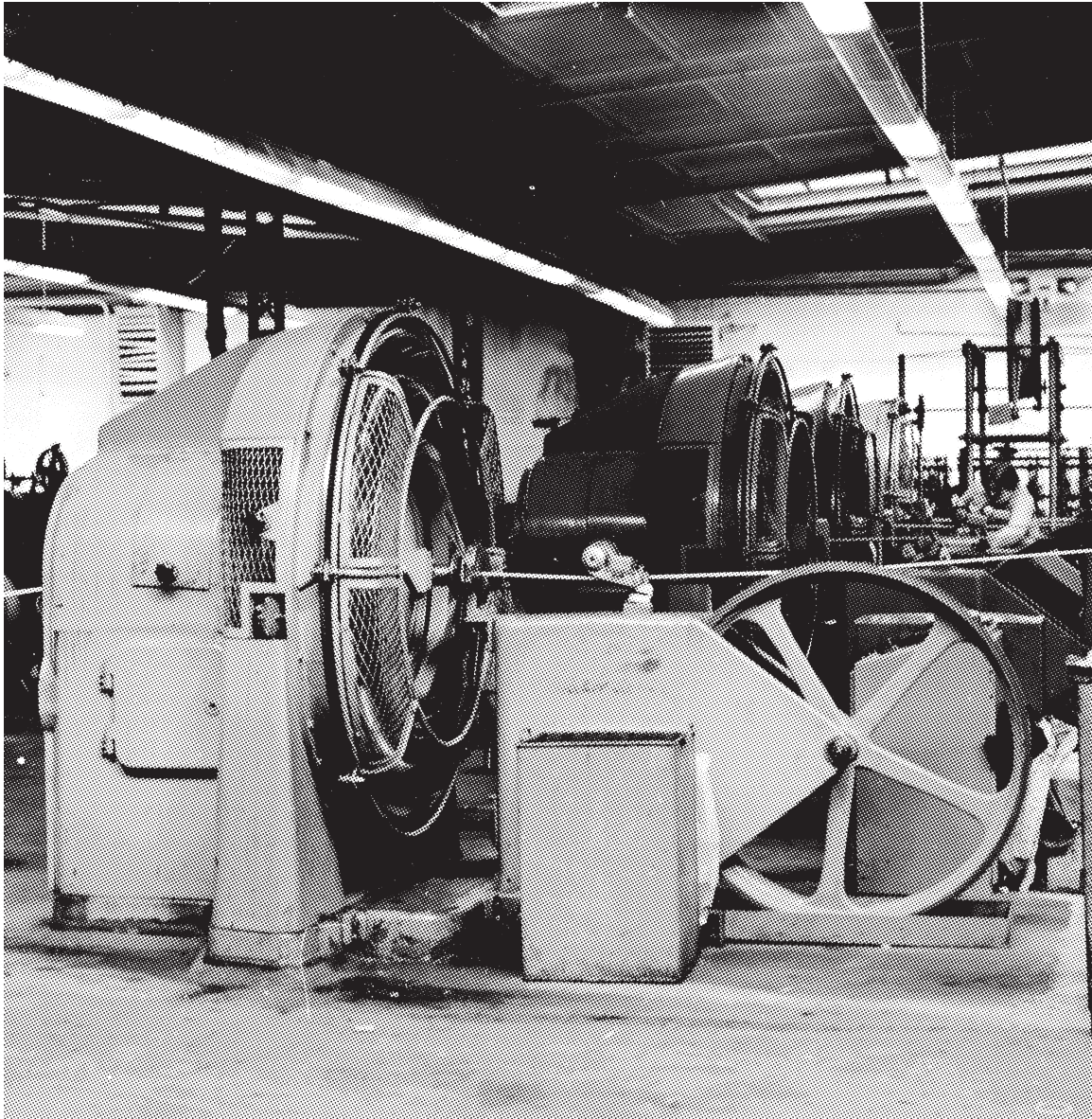
Hall A, 1971



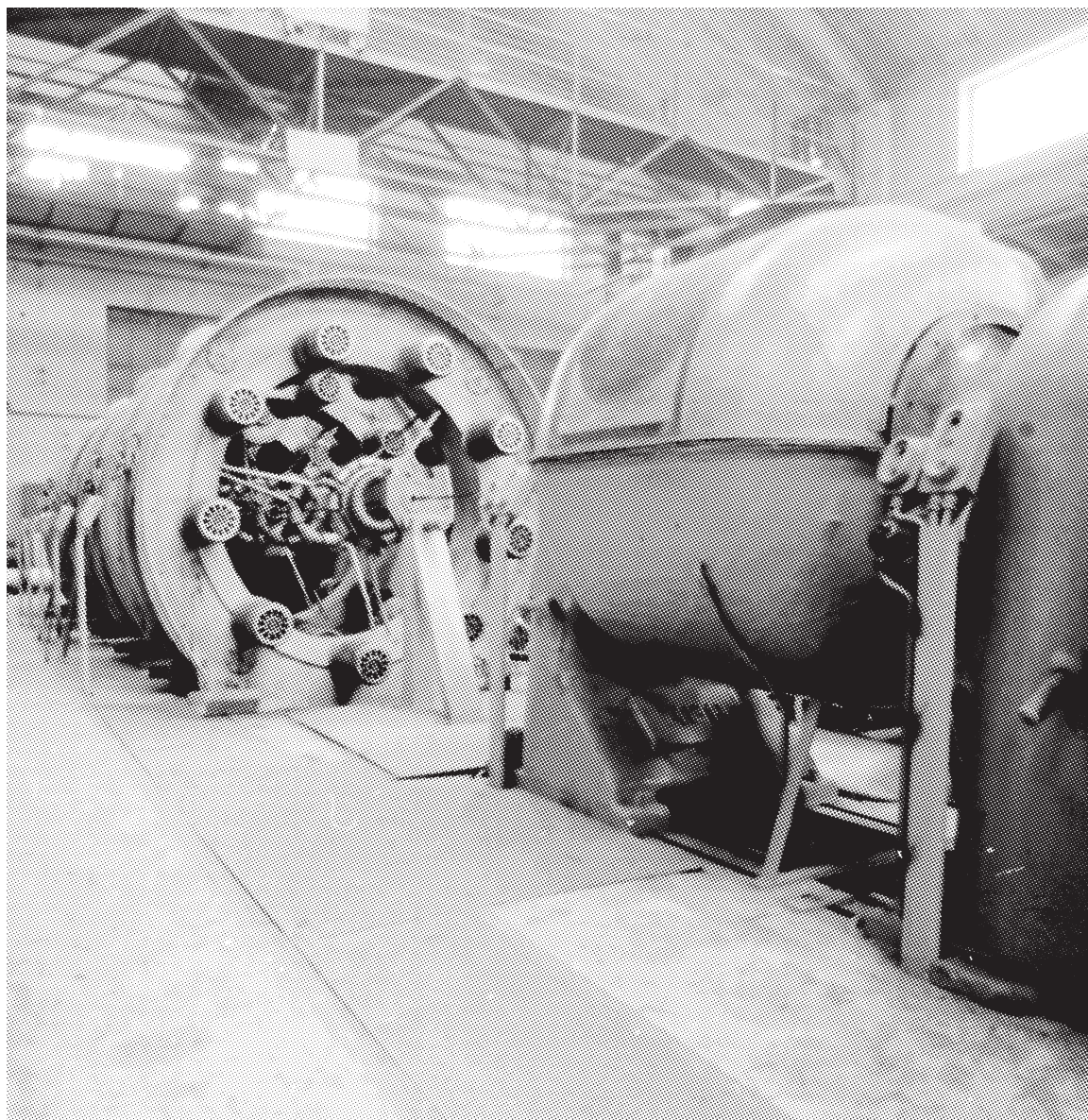
Cable Varnishing hall, 1973



Cable Braiding hall, 1971



Cable Braiding hall, 1971



Stranding machine in the Cable hall, 1973



Foundations of the C2 hall, 1993

things, the report was supposed to make the company's work appear more human and attract new employees, because as the staff size reached its zenith in the early 1960s (1,026 employees), numbers had been declining for a long time and the lacking workforce was one of the cable company's main problems. Local experts invented many production "improvements", mostly because they simply did not have enough workers and somehow had to cope with it on their own. *"I didn't meet people at the Kablo cableworks in Hostivař who were into using big words. Everyone takes what they do for granted. Communists and non-members of the party. They all act like farmers. They are, too,"* Havlíček added. Another article by Ilja Trögl from 1976 spoke about the cableworks' plans and tasks, as well as about the problems caused by the shortage of workforce or in overcoming obstacles in fulfilling the plans. *"Wires reminding us of mighty and mysterious snakes wind from the many production lines through a spacious, bright and clean hall. Hundreds of metres of cable cores are in sharp contrast to the small number of workers operating the machines,"* writes Trögl, emphasizing the efficiency of the local socialist labour brigade (a form of motivating socialist employees, BSP was a workers' team, which took part in certain competitions with brigades from other companies, and the members were rewarded with bronze, silver and gold badges, as well as financially and with social events). Although the company lacked manpower, its core remained unusually stable; thus, when celebrating its 60th anniversary in 1981, the company awarded 76 employees who had worked here continuously for more than 30 years.

In addition to the small number of workers, the problem with the shortage of metal and wooden drums for winding cables persisted for a long time. The cable factories had but a few, yet frequently empty ones kept rusting and rotting down around the construction sites for years. The drums themselves were basically the packaging, which is why their price was included in the orders, so the cable company didn't have the option to withdraw them on its own (they were no longer its property), although it was possible to return them and get a returnable deposit back, like with beverage bottles. Consequently, the company had no choice but to pay for a media advertisement calling upon customers to return the drums to the plant. However, the companies lacked motivation, as it was difficult to transport the huge drums (they weighed half a tonne or more); moreover, due to the fact that they often had been lying in the open air for several years, they were returned destroyed, especially the wooden ones.



1978 Return the Drums, periodical Tvorba

Despite these problems, the company prospered well. In 1981, it was able to celebrate another round, this time its sixtieth anniversary, editing a brochure again on this occasion, albeit a more modest one, and there were celebrations at the factory. Would you like to hear a little more enthusiasm about socialism from contemporary texts? *“Backed by the party, the trade union and union organization, we will jointly achieve all our working goals set forth by the XVIth Congress of the Communist Party”*

During the 1970s and 1980s, the technical equipment and the mentioned extension of the factory with additional halls went on even after director Buchlovský had left and was succeeded by technical deputy Ing. Vladimír Kellner. After him, this post was taken over by Ing. František Herman.

The company acquired an automated multi-storey storage supplied with two insulation lines, which enabled the production of up to forty-eight cores on the machine and the sheathing line at low cost. Furthermore, in 1984 it was connected to an entirely new siding with a bridge crane operated loading ramp. The new Hostivař sidings system was put into operation as early as in 1975 and went around almost three quarters of the entire local industrial area from the east (it finally crossed not only Hostivař, it also extended to Dolní Měcholupy and later Štěrboholy). The system interconnected several companies, and

it was a joint investment by the cableworks and Kovošrot, as well as TOS Hostivař, the Léčiva pharmaceutical company and the Čechofracht transport company. The cable car siding is still in use today; PRAKAB currently owns two fully functional wagons, which also serve as mobile warehouses. The original historic southern siding thus lost its significance and disappeared, and the tracks were later torn out on the cableworks plot.

In the second half of the 1980s, the company also decided to help solve the housing situation of its workers. In 1986, the company had a large dormitory with a capacity of 303 beds designed in the nearby Horní Měcholupy and construction works began two years later, but after the revolution everything turned out differently and Kablo leased the building to CBN. Hotel Viktoria, which had its own restaurant, was established here, but it did not prosper and the building was eventually bought by the city district. Today, the Prague 15 town hall is located in what was originally intended to become a hostel for the cableworks employees. Now we are approaching other revolutionary events in our history.

The circle closes - Back to the roots

“Bring flowers” said a leaflet circulating in Prague in mid-November 1989. It was an invitation to a student demonstration associated with a reverential act on the occasion of the 50th anniversary of Jan Opletal's death. This student from the Charles University Medical Faculty died as a result of injuries suffered during an anti-Nazi demonstration on 28 October 1939. From the beginning, the demonstration on 17 November 1989 was not only to be commemorative, it was also to express the students' dissatisfaction with the situation in our country. “We do not merely intend to reverently remember the tragic events of the time, we want to actively subscribe to the ideals of freedom and truth, for which the participants of these events sacrificed their lives. These ideals are at stake today too, and we do not want to be a mere shadow of our university fellows who bravely spoke out for them 50 years ago.” said the aforementioned leaflet. The demonstration began peacefully, but soon chanted the names of Tomáš Garrigue Masaryk and Václav Havel, calling for freedom and democracy. In the end, it was hit hard by assembled security forces with dogs and batons, and arrests followed. The most

important evening of our history since 1968 arrived, which eventually caused the communist regime to fall.

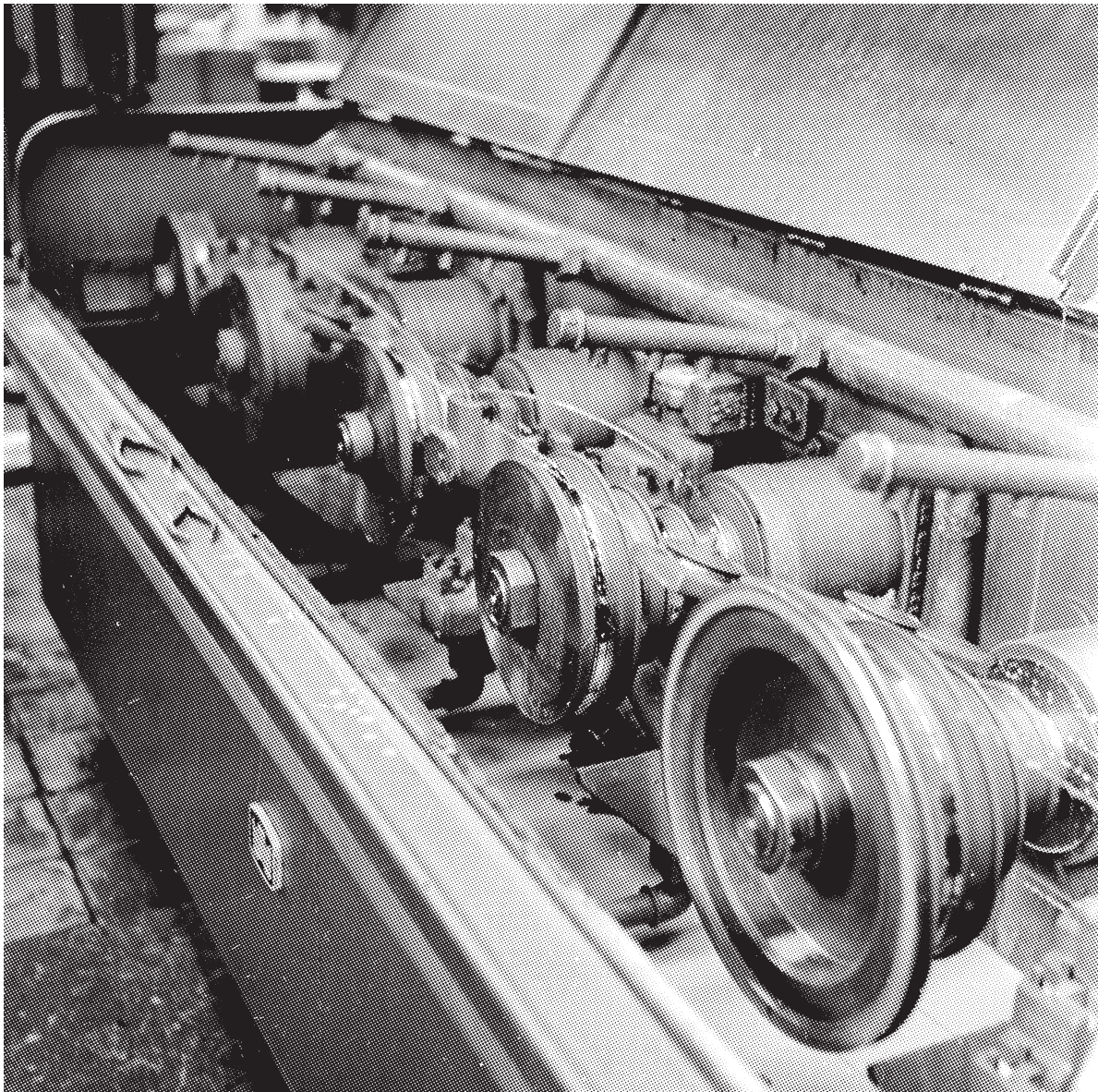
The events of November 17 were followed by massive protests throughout the country. Cultural facilities, predominantly theatres, gradually joined them in the strikes, but industrial enterprises also joined in, which were soon joined by the Hostivař cableworks, also helping in the collapse of the totalitarian system.

The Velvet Revolution fundamentally changed all areas of life. The fall of the regime entirely changed the political situation, as well as the economic, social and cultural situation. After four decades, the country reopened towards democracy and freedom of speech, just as it did to capitalism, with all the pros and cons this entails.

The name of our cable company was somewhat extensive at this time: *Závody silnoproudé elektrotechniky, Koncern Praha, Kablo Kladno, koncernový podnik, závod Kablo Hostivař* (Heavy current electrical engineering plants, Prague Group, Kablo Kladno, group company, Kablo Hostivař plant). Following a short period when the new economic conditions were being clarified, the company emerged from a centrally planned state economy, freeing itself from the role of a mere group company after thirty years. Provisionally, it was referred to as *Kablo Praha Hostivař*, offering copper power control and telephone cables, aluminium power conductors and copper bare and varnished conductors. A company store was newly opened right next to the factory. Even the thieves who broke into the factory area in April 1990 and stole 42 coils of enamelled copper wire worth 80,000 crowns were unable to spoil the joy from the regained freedom.



Office building, 1992



Wire drawing machine, 1973



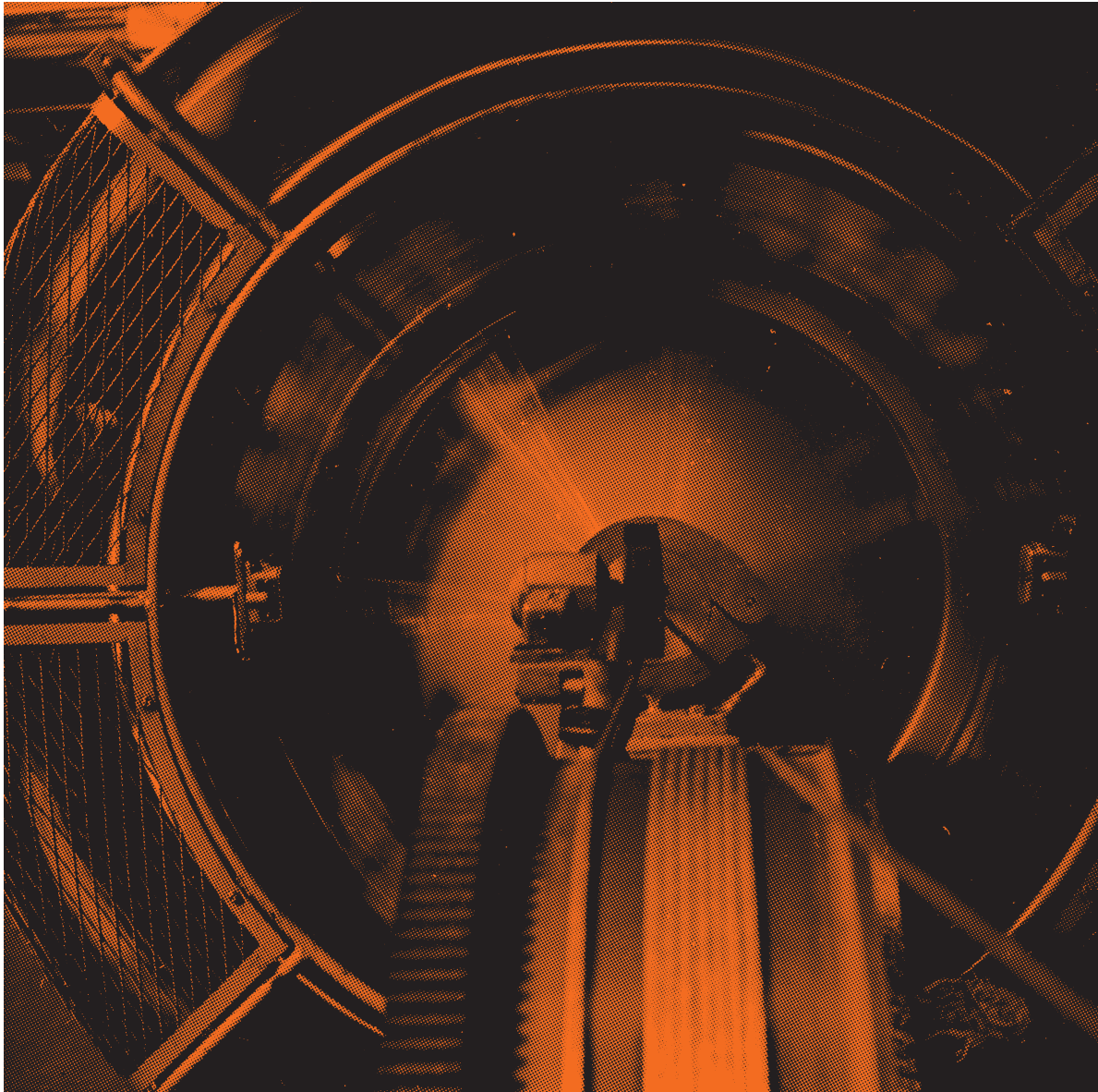
Construction of the central PVC distribution system, 1978



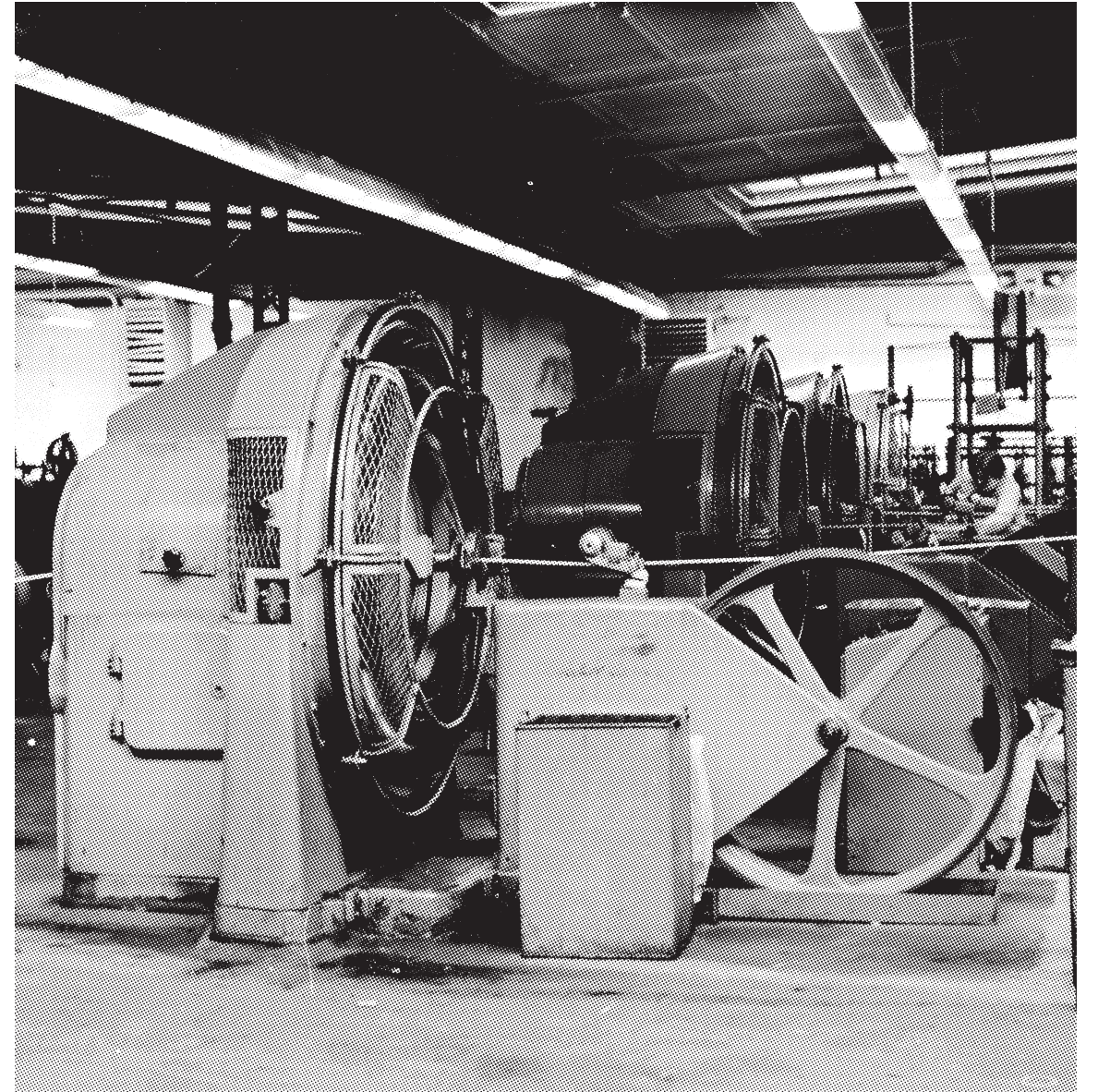
Construction of the central PVC distribution system, 1978



Hall A construction, 1968



Testing laboratory, 1969



Testing laboratory, 1969



Cable Braiding hall, 1971



Wire drawing machine, 1973

The transition to a market economy system also led to the company changing its legal form and being recreated as a joint-stock company, which was established on 11 November 1991. It also readopted its former name, albeit changing it slightly, now officially named *PRAKAB Pražská kabelovna, a.s. (Prague Cableworks)*, which was a revival of the pre-war corporate brand (at first even using a slightly modernized First Republic logo). The new company CEO, Antonín Novák, also openly supported the legacy of the former director Emil Buchlovský.

At the same time, the company was well aware that joining an already established foreign company would be strategically favourable in order to get a hold on business in Western countries. Coincidentally, negotiations with the Schwechat cableworks started without the Austrian party being aware of the fact that the history of these companies was already intertwined. However, sentiment is something that has no place in trade, and negotiations were both long and difficult. Nevertheless, finally it was successfully concluded that on 26 August 1992, a majority of 51% of shares were transferred to Schwechater Kabelwerke (SKW), the company our enterprise stemmed from more than seventy years ago and from which it was torn apart by the Nazis half a century ago.



Heinz Tremmel



Heinz with his wife Ingrid and family



August 26, 1992 conclusion of the contract between PRAKAB and SKB

The Schwechat cableworks remained operational all the time, restituted after World War II and returned to the Steiner-Eger families, as Robert Eger, Gisela Wiese and Henrietta Steiner's children Kurt Steiner and Erna, married name Tremmel, took over their shares, while Johann Breiner remained director until his death. However, the situation proved quite uneasy, as the company turned out to be severely indebted due to the entirely incompetent leadership by the Nazi Hans Rott. In 1959, Heinz Tremmel, grandson of the founder Otto Steiner, became company CEO. His family is still associated with management and ownership of the company today. Tremmel led the company out of the post-war crisis, reorganizing it entirely, extending the factory and modernizing it. Let us say a few words on the years of systematic work that certainly do not only mention profits and successes. The machinery was renewed and modernized thanks to the Marshall Plan, US economic aid provided for Europe in the post-war era. Heinz Tremmel led the SKW through three decades, setting up a full-fledged company, a significant player in both the Austrian and European cable market. From the early 1990s, he also began involving his successors, sons Christoph and Alexander, in the company business, and in 1991 they celebrated the company's one hundredth anniversary, founded by their Czech-Austrian ancestor Otto Steiner. And it was the Tremmel brothers who linked the company with the Hostivař cableworks, closing the circle again.



Dr. Christoph Tremmel and Mag. Alexander Tremmel

"The nerve-racking negotiations were often bound to fail, as the different mentalities of the parties from the two economic systems were still evident, which led to many misunderstandings." This is something we read about the ultimately successful negotiations in the book *Kraft der Verbindungen (the Power of Connections)*. The companies came together and both made money on it. *"Taking this step, SKW suddenly took on new dimensions, as PRAKAB was producing on approximately five times the production area and employed over 600 people at the time."*

This brings us to the events of the last thirty years.

Chapter 5

PRAKAB

the Cable Company of the New Millennium

In order to address the last years of the cableworks' history and the present of PRAKAB, we once again have to go back to the beginning of the 1990s and give a broader picture of the situation in the Czechoslovak industry and life at that time. In November 1989, the Velvet Revolution brought about a tremendous change regarding the country's political situation, and ended the controlled planned economy as well gradually. As already mentioned, the former Kablo Hostivař, like all cable plants in the Czechoslovak Republic, was affiliated to the state enterprise Kablo Kladno. The Kablo Group was subsequently incorporated into the operating group of the Power Electrical Engineering Plants (ZSE Praha). Most of these plants became independent state enterprises after 1989 and were privatised either under the coupon privatisation by the National Property Fund or sold to direct bidders (e.g. Kablo Děčín or Kablo Bratislava).

Privatization and the market economy

Kablo Hostivař, which at the time employed over six hundred people and a turnover of around half a billion crowns, remained for the time being the only ZSE Praha cable manufacturing plant. This group was subsequently privatised by sale to the banking sector, specifically in this case to the Investment and Postal Bank, in accordance with common practice at the time.

New trends within the economic and political situation left a significant impact on the further development of the cable company. The Civic Forum, or "Občanské fórum" in Czech, (civic associations were being established back then only as a partner for negotiations with the political establishment, but also in offices and plants) started negotiating with the original management of the ZSE Praha group regarding staff changes in the top management of Kablo Hostivař, thanks to which an entirely new management presided over by director Antonín Novák and his financial director Jaroslav Krňák was named.

The company immediately had to deal with several fundamental problems, the most important of which being of course the transition from the planned economy to the newly developing market economy. On the one hand, this meant that the company had to take over financing the company itself since, until that time, all the financial resources had been allocated centrally. The second major challenge was related to the changed

conditions in domestic distribution, as there were new business structures coming up on the cable distribution market and our company had to establish cooperation links with them. However, due to the generally significant shortage of all types of goods, including cables, this proved to be relatively easy. In addition, manufacturers were in a better bargaining position in the market at this point. It also helped that the formerly centrally controlled specialisation of the cable industry, where individual cable types were often produced in only one plant, created a good scope for a favourable profit structure.

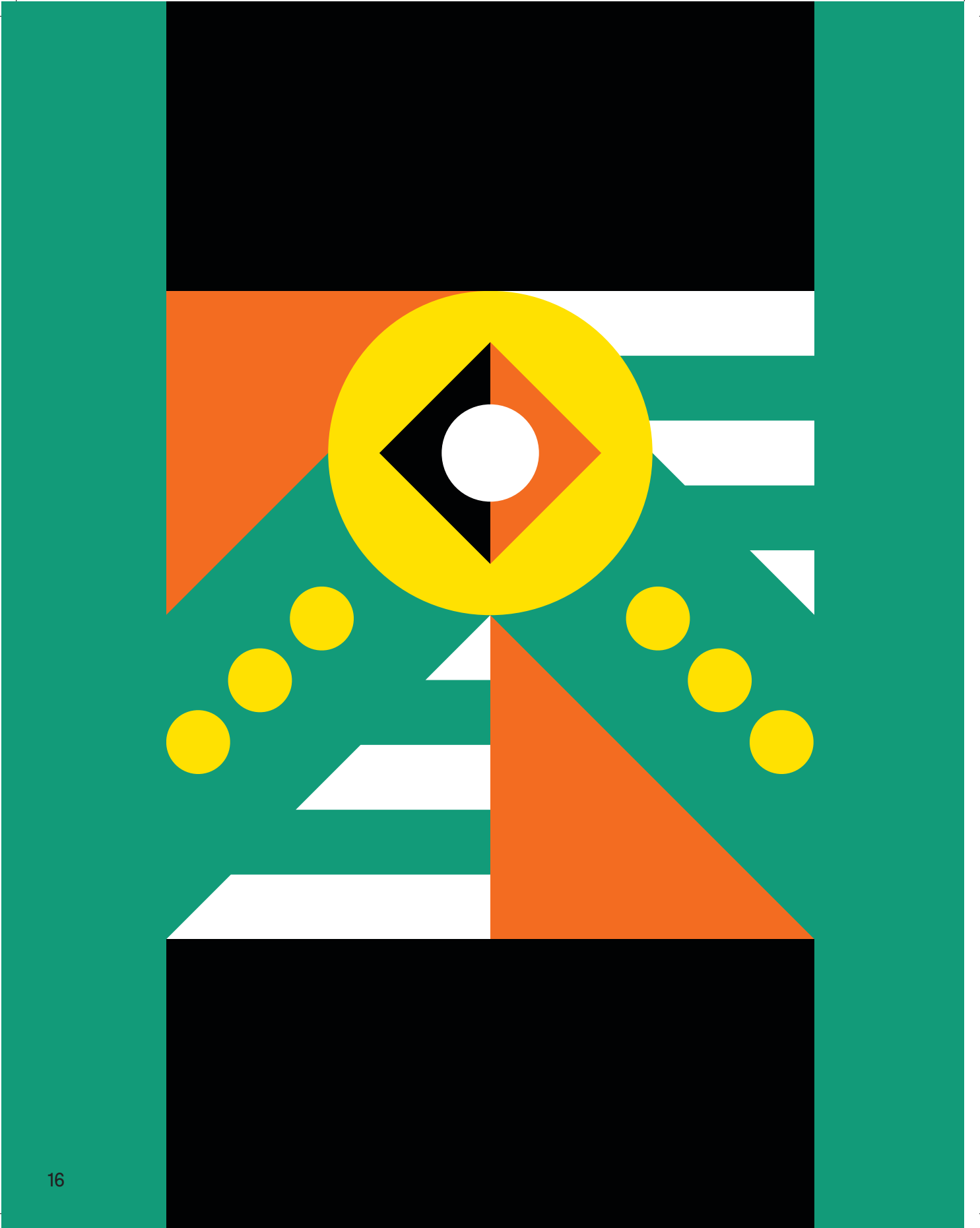
Changes in exports, traditionally an important pillar of Kablo Hostivař, proved to be a problem. Abolishing state subsidies on non-ferrous metals in 1990 led to far-reaching problems, especially the cable company's foreign trade with Western countries, to which its products had been exported (already in the 1980s, the Nordic countries had become important markets). Almost overnight, the cable company lost its competitiveness on these markets and had to concentrate almost exclusively on the domestic market.

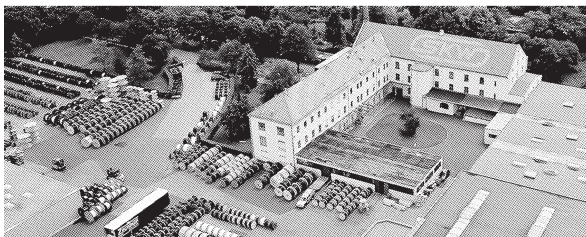
Unfortunately, this challenging situation had to be reflected in the company's personnel policy. The total staff number was entirely disproportionate to the sales level achieved, and in addition to that, the sharp inflation rise further increased labour costs. As a result, within three years after the revolution, the company's staff size dropped from the original 636 to about 345 (remaining virtually on the same level until today).

Finding partners

The beginning of the 1990s revealed that Kablo Hostivař, like many other companies, had great potential on the domestic market, but it lacked the funds to make investments and partly to conduct the business itself. However, at that time, external financing was hardly possible due to the high interest rates (up to 18% per year), so the company's management focused on finding a suitable business partner. Consequently, the first step was transforming the plant into a joint-stock company in November 1991 (with effect from October 1). The management of the Czech financial institution Investiční banka at the time preferred a strategic owner who would further develop the plant and adapt it not only to the domestic but also again to the European market.







Schwechat Cable Company (SKW) reconnects with PRAKAB after half a century



SKW premises in Schwechat

A number of major players in the European cable market expressed interest in taking over PRAKAB, with the shortlisted companies being the large Swedish group Asea Brown Boveri (ABB) and the well-known Austrian company Schwechater Kabelwerke (SKW). Following an almost entire year of negotiations with the ZSE Praha management and the PRAKAB a.s. management, the decision finally fell in favour of the Austrian partner. The relevant purchase contract to acquire 51% of the shares was concluded in August 1992. One of the main reasons for making this decision was indeed SKW's historical link to the Hostivař plant, but above all, the PRAKAB management and the SKW owners found a common vision regarding the company's future, which proved to be the right one as we can say following another three decades of this cooperation. After many years of separation, the original relationship was restored and the next PRAKAB development stage began.

One of the first jointly conducted activities of the Czech and Austrian parties was resuming the production of signal cables in 1992 and 1993, whereby PRAKAB again provided cables that it had already produced before the Second World War. Our factory significantly expanded its product portfolio in cooperation with experts from SKW. Indeed, our company has retained this trend until today, when in addition to making power and installation cables, it's producing a huge range of non-flammable safety cables, but we'll get back to these.



After years of dilapidated state-owned buildings, reconstruction took place in 1995

The dynamically occurring changes in society didn't stop in the following years either. SKW contributed know-how to its Prague colleagues from both a technical and organizational point of view. During 1993, therefore, a number of personnel changes were made at all levels of management. This required, on the one hand, a reduction in the number of administrative staff but, on the

other, the gradual introduction of modern technology, which again led to an increase in productivity. The company also revived its export of cables abroad, although domestic sales still dominated, accounting for around 80%.

Export and world successes

In 1993, the Austrian partners at SKW, led by Christoph and Alexander Tremmel, bought most of the remaining shares, thus gaining full-scale control of the company's management, which continues to this day. In the same year, the management also decided on the most important investment of the time – the resumption of telephone cable production, and the company built two new production halls and purchased the corresponding machinery. In parallel with this strategic decision, the company started successful negotiations for participation in an international tender for the supply of telephone cables for the reconstruction of the Český Telecom (Czech Telecom) network.

At the same time as this important contract, the company started the reconstruction of the main production areas, purchased a new telephone exchange, invested in new changing rooms for employees, expanded the IT network and equipped the workplace with increasingly necessary modern computers.

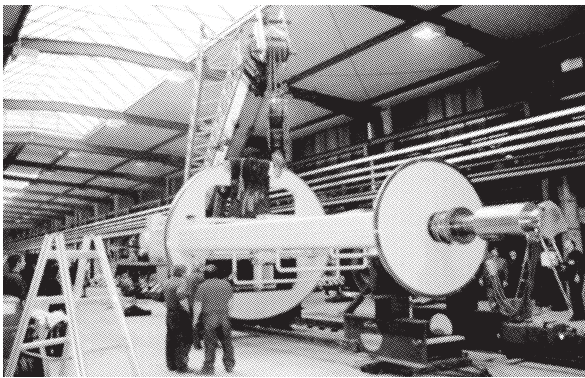
In 1994, it also started implementing the ISO 9001 quality system, which was successfully completed during the following year by acquiring the certificate from RW TUW Essen. Translated into commonly understandable words, ISO 9001 is the most widely used international quality standard, which means that PRAKAB obtained a world-renowned certificate of quality for its products and services.

Success went hand in hand with an ever-growing number of modernizations and one of the most important investments became the purchasing of a modern drawing machine from Niehoff in 1996, which helped us to improve shortcomings related to the existing wire drawing capacity.

In 1996, PRAKAB celebrated another anniversary, already the 75th one since its establishment, but in no case was it possible to rest upon the laurels of new successes. With the Czech Republic integrating more and more into European and thus also global trade, it also opened up to new foreign companies as well as investors. The second half of the 1990s brought a lot of new

competition and more active cable imports, while the crisis in the cable industry in Western European markets was also deepening. For this reason, SKW's management decided in 1997 to end production in Schwechat and completely relocate it to Prague. This move virtually doubled the Prague production of power cables. The successful transfer of very powerful machines from SKW at the time ensured that PRAKAB is still able to produce e.g. aluminium cables very efficiently today. This has been particularly evident in recent years, when there is a great demand for these cables on the energy market and PRAKAB keeps pace with the most important and much larger manufacturers.

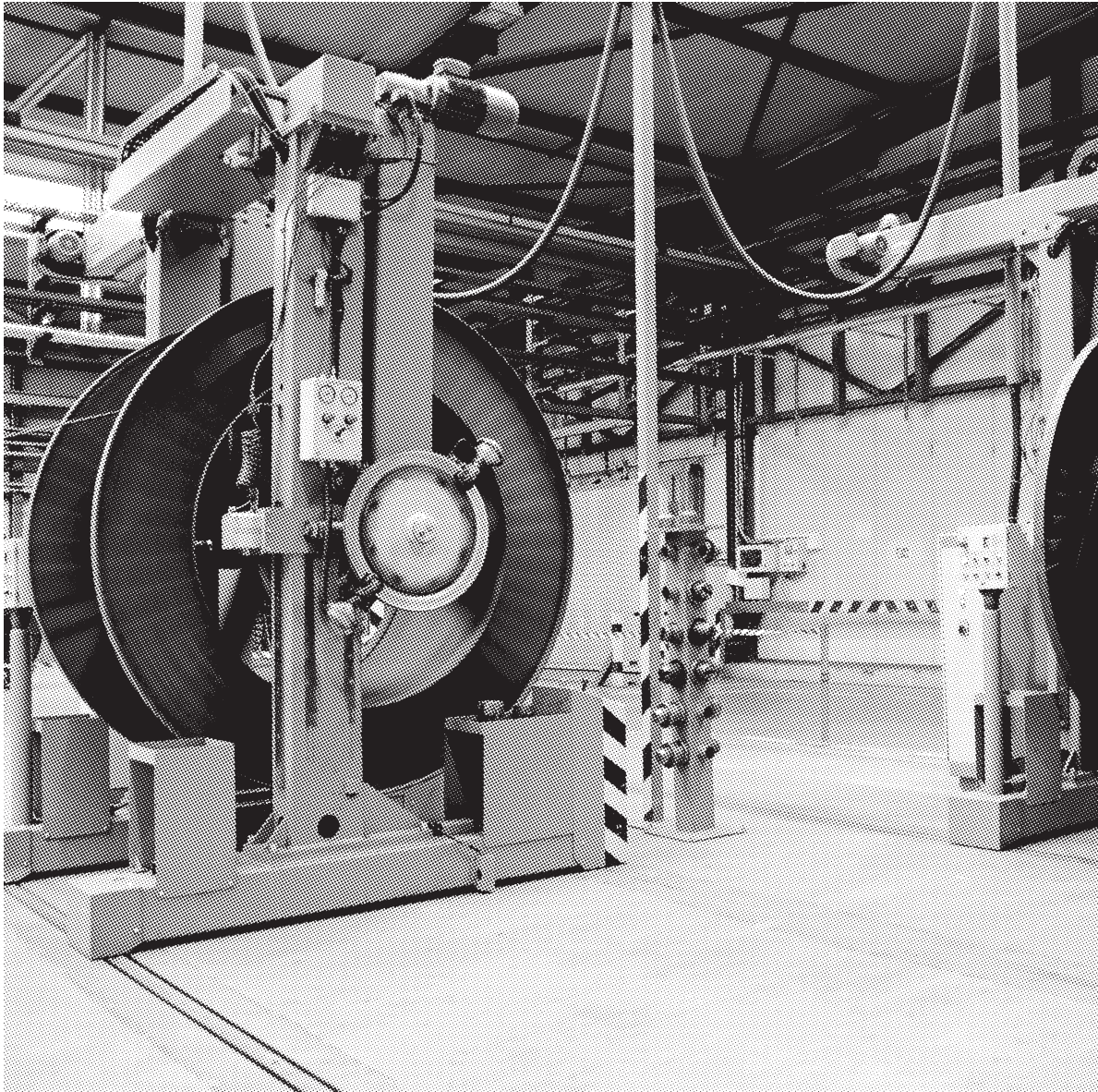
In 1997, the volume of total investments reached an entirely new volume of 156 million Czech crowns, which we can mainly attribute to the required construction of a new production hall (42 million) and a shipment hall (34 million). Likewise, the company boosted enamelled wires production, which had a long tradition in PRAKAB, and in addition to machines relocated from Austria, it purchased other basic equipment (such as the Stolberger universal stranding machine, a new packing machine and a ring winder).



Universal stranding machine Stolberger

The new millennium and expanding production

The beginning of the new millennium was the next stage in the development of the cable company. The plant had become one of the leading European suppliers of power cables (1 kV), insulated overhead lines and fire-resistant safety cables. Indeed, in 2002 PRAKAB developed and tested some of the first non-flammable cables in the world.



Cable winding on the AYKY hall



Warehouse in the dispatch hall



Spools on the C2 hall



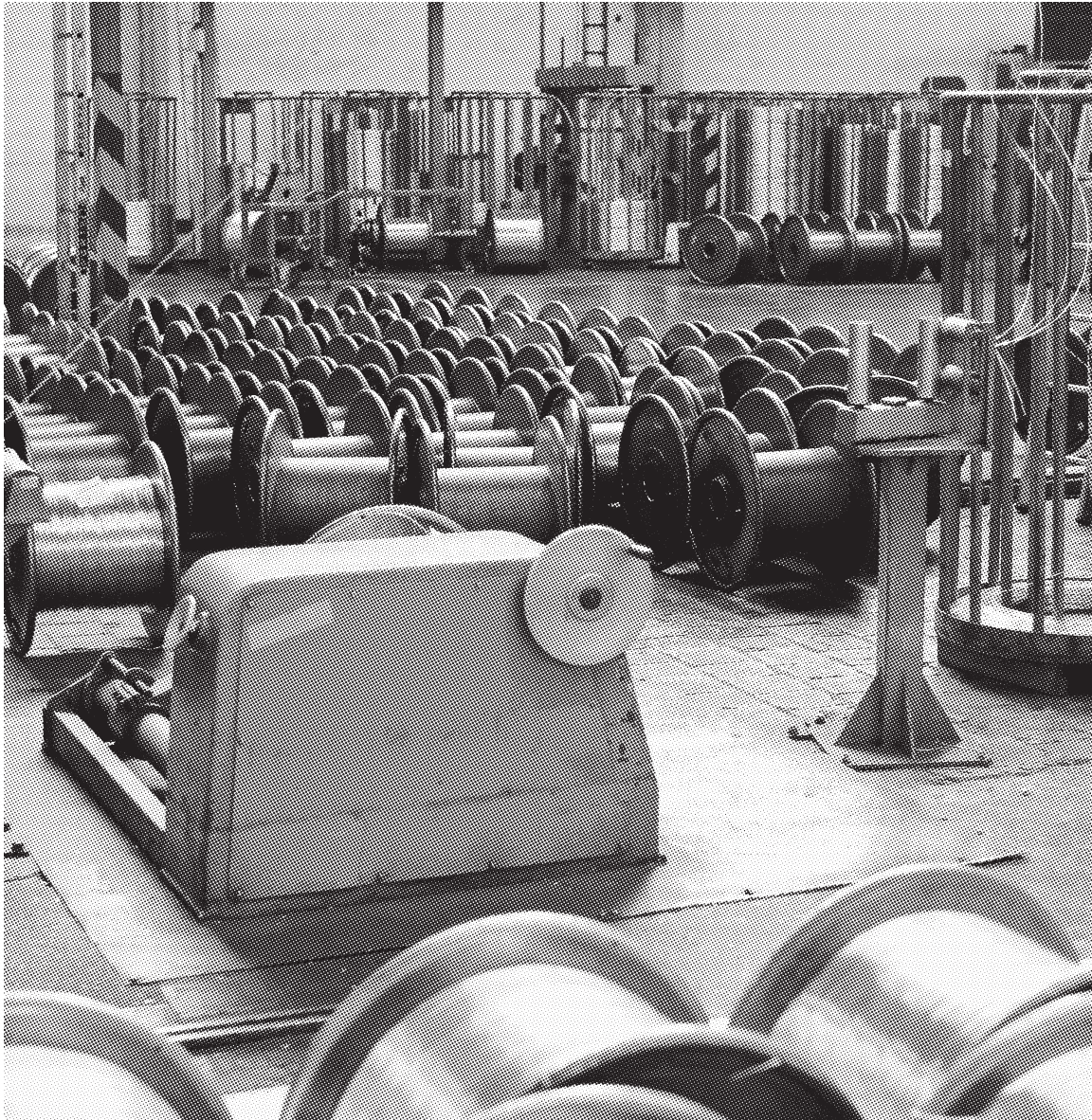
Cable hall today



Universal stranding machines



Wire drawing plant today



Spools from stranding machine on the wire drawing plant



Cable unwinding on the AYKY hall

As early as in 2001, the company's total turnover exceeded 2 billion Czech crowns for the first time, and in contrast to the previous years, the economic result improved significantly as well. In addition to introducing bar code readers into production, our company has mainly invested into an insulation and sheathing system for safety cables. This paid off especially in 2002, when, as a result of the biggest flood in the Czech Republic's recent history, it won a major contract to supply new cables for the Prague metro. Additionally, our company's significance grew thanks to a long-term order for the supply of signal cables for the railway signalling elements control system provided by the Czech company AŽD, which is a major company supplying large quantities of equipment (and also building individual railway sections) to Czech Railways. Cooperating with this partner is one of the most important contracts that the cable company has won in recent years. We can come across Hostivař cables at interlocks, railway traffic lights, barriers as well as many other safety features.

It is precisely signal as well as non-flammable cables which figure among the company's top priorities. *"In this sense, we are kind of pioneers as we are able to produce these cables as really high-end products,"* says Tomáš Zieschang the current managing director. *"Railway cables filled with special vaseline to prevent moisture from penetrating them are among the specialties made by our company, which I can name. They may also be armoured so as to withstand rodents. We also supply E90 flame retardant cables on a large scale. The number in minutes represents the time the cable must operate in a fire."*



Test of fire propagation
in bundles



Some of the first flame retardant cables in the world were
manufactured here



Test of fire propagation in bundles

In case of fire, the so-called FRNC (Flame Retardant Non-Corrosive) cables can save lives in the subway, in elevators, by automatically opening doors or ensuring the functionality of escape lights, cameras or HVAC systems. Firstly, these cables have to remain functional in the heat of the fire for as long as possible, and secondly, they at the same time have to refrain from producing toxic fumes even when exposed to high temperatures. In 2002, our company also opened up its own laboratory, where employees mainly focus on developing and testing these cable types. One of the most successful types of flame retardant materials today is silicone, and the company is constantly developing new compounds in its special modern laboratory. This has allowed us to remain among the top European companies in this field and be a member of international commissions setting relevant standards.

In 2003, our company obtained another globally acclaimed quality certificates, this time referring to the ISO 14001 environmental standard. Once again, it expanded its technical background, purchased a drawing line for sector conductors and started producing cross-linked PE insulation using Monosil technology.

The year 2004, when the Czech Republic's became an EU-member, was characterized by ever-increasing import volumes

of competing cables into our country which meant that the price level on the market gradually declined. As a result of this and given the intensive deliveries related to the parent company, PRAKAB's domestic turnover share dropped to 35%. Consequently, further investments followed: the company expanded its shipment hall, purchased a silicone insulation production extruder, a double twist stranding machine and double twist laying-up machine. The entire production area had by then grown to a respectable 31,000 sqm, making the plant one of the largest in this industry in Central Europe. During the following year, the production of flexible cables was ceased and the machinery was relocated to the newly built sister company Industrial Cables Slovakia (ICS) in Nitra, Slovakia.



Industrial Cables Slovakia ICS company premises in Nitra



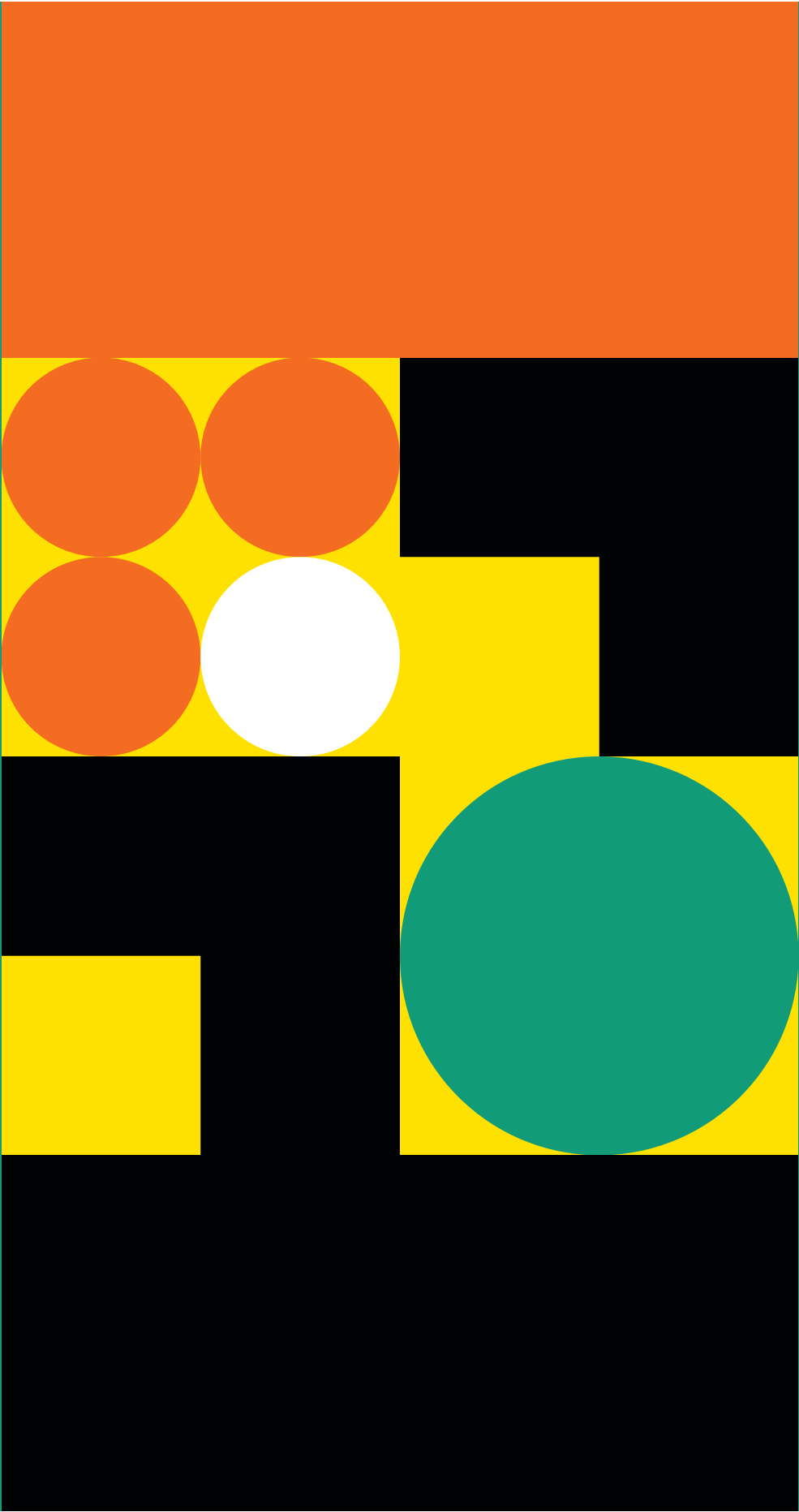
ICS management and employees

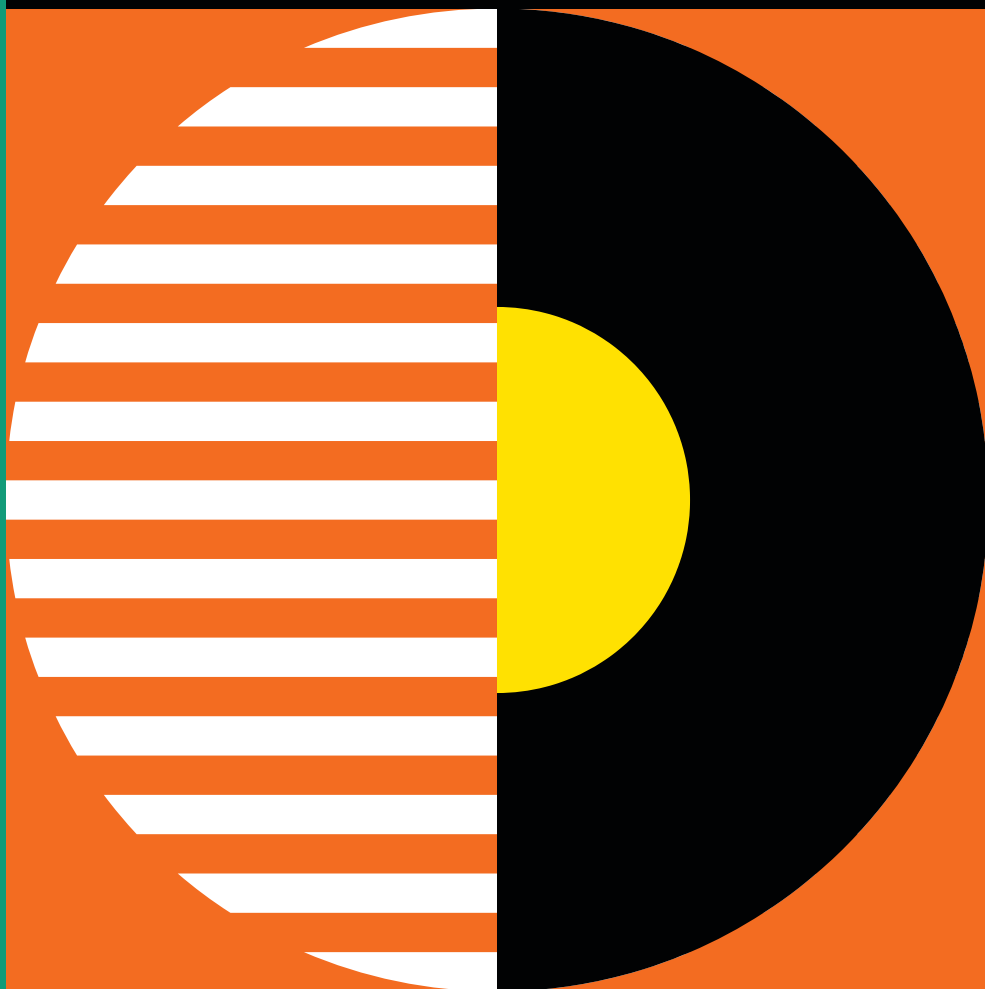
Our company made additional large investments in 2007–2008 anticipating the looming global economic crisis. The management decided to expand the production of 1 kV cables with the total investment value amounting to more than 300 million Czech crowns. In order to do this, our company had three more production halls built with a total area of 4,500 sqm. It invested in a new basket stranding machine, an annealing furnace for aluminum wires, a double draw machine and various stranding machines, and also overhauled and partially relocated the most necessary equipment. In addition to that, it set up the already mentioned test and lab center for testing fire-resistant safety cables at this time. Here you will find density measuring equipment, fluid mixers, laboratory presses or testing equipment for measuring mechanical properties.

Investments and the economic crisis

Upon completing these investments, PRAKAB was hit by the rising global economic crisis, which had become particularly evident at the end of 2008. This was well reflected by the dramatic drop in the price of the most important raw material in the cable industry, i.e. copper. At the end of the year, the stock market price fell from \$ 8,812 in June to \$ 2,935 per tonne.

Consequently, our company stopped further large investments focusing on increasing efficiency in this difficult period. In response to the dropped market prices, the so-called “lean methods” were introduced in the production and logistics sphere, which fortunately soon brought success. Our company came up with a new remuneration system for production workers, which again increased productivity, reduced waste and raised employee interest in achieving better results. At the same time, many staff changes in the senior and medium-level management took place and in 2008, Ing. Jaromír Schmid was appointed the new managing director. *“We are proud that the market now knows us as quality manufacturers,”* he wrote then. *“The best proof to this is our high production volume and numerous customers from all over Europe, who have remained loyal to us for many years. But we want more”* he added, and his words were backed up by the fact that our company again increased exports under his leadership, mainly to Germany and Austria. In 2009 and 2010, the economic results confirmed the success of the measures that had been implemented and our cable company was well on its way out of the economic crisis. At that moment, it was collaborating with Russia as well, where it also co-founded the sister company ACT Ltd. The hitherto joint-stock company then changed its legal form to become a limited liability company (with effect from 1 January 2011).







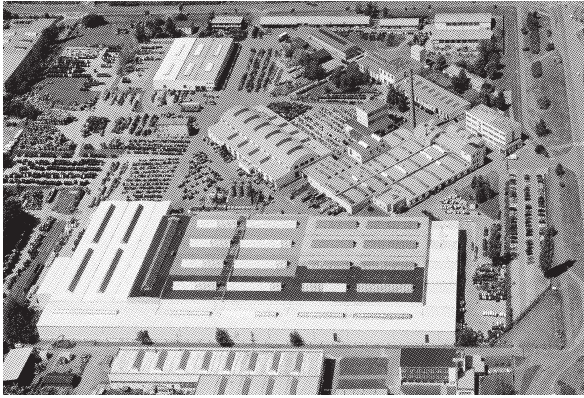
The largest ever single investment – construction of a new production of PVC compounds, 2015

Another important step into the future was taken in 2014, i.e. following several years when no major investments were made, with this step consisting in introducing the PVC compounds production facility. Thus, we became able to cover the whole volume of this important raw material that we required, with the company today producing up to 15,000 tons of PVC per year. The 16-meter tall four-storey mixing tower (where the mixture itself is being produced), five raw materials storage silos for powder-form materials and two high-capacity tanks for liquid plasticizer are the company's largest independent investment in history.

The Fourth Industrial Revolution

In 2015, Ing. Tomáš Zieschang became the company's new managing director and under his guidance, the installation of a new silicone line ensued in 2015–2016. In addition to traditional customers (Austria, Germany, Slovakia), exports to the markets in Switzerland, France, Denmark or Israel increased as well. Our company started supplying special modern safety cables used for reconstructing the Vienna or the Hungarian subway. However, our company is still providing not only the most high-end cable types, but also old ones, which most competitors are not making any more. *“The demand for these cables is high. There are areas where old cables need to be replaced by the same product and not every field is as progressive as e.g. electronics,”* says director Zieschang. *“For example, the railways have their own regulations that remain valid for a long time as the products serve for decades in this area.”*

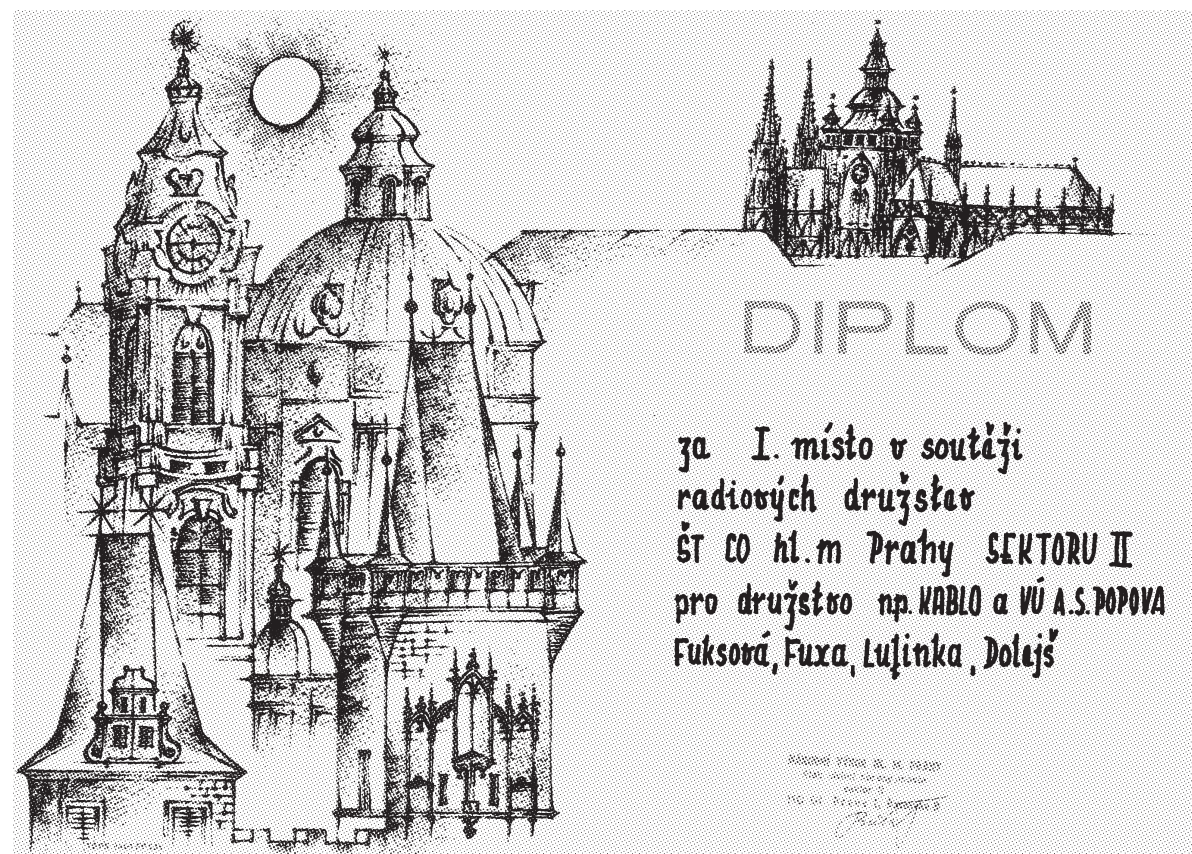
And if somebody e.g. retrofits railway stations with kilometers of cables between them they will then need the old type of cable again, as the new type won't connect to the old one given the fact that these cables don't change over a long period of time."



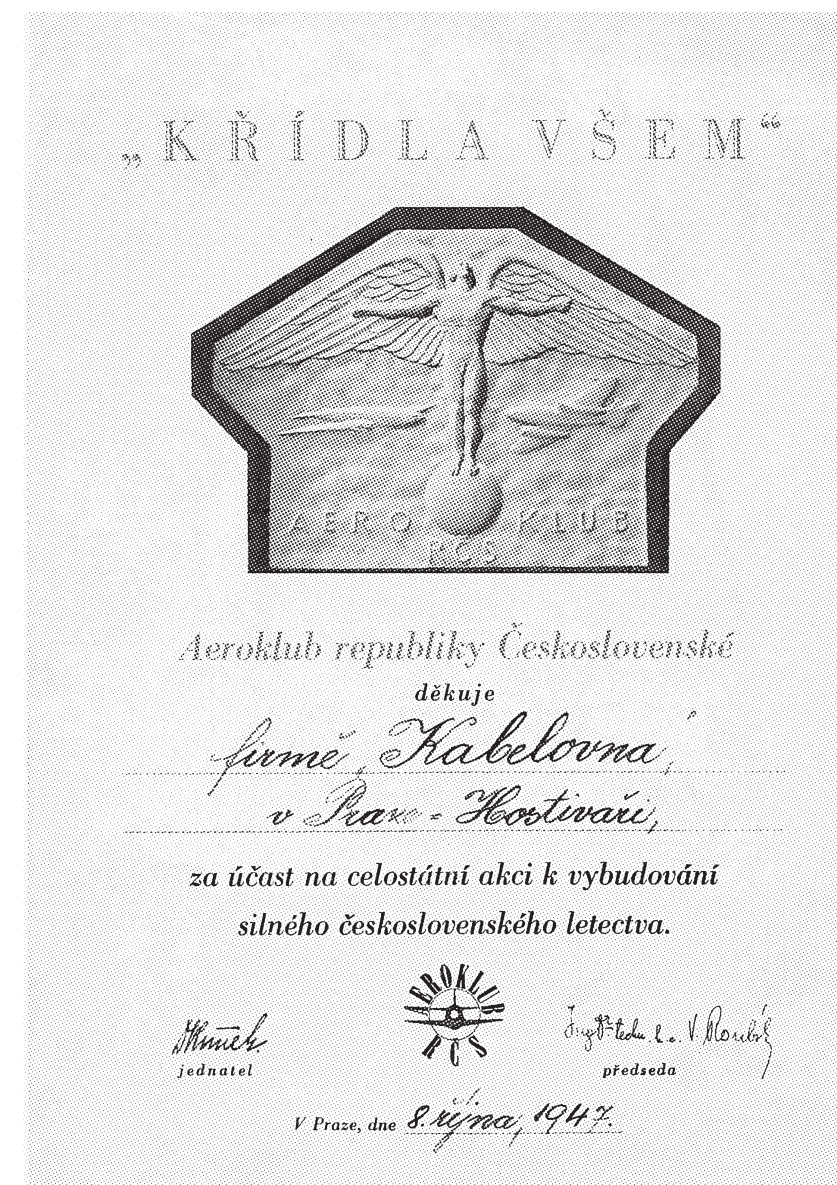
Aerial photograph of PRAKAB, 2017

But the company's priority is the modern world, which is why the cable company is also involved in the German Industry 4.0 project, which refers to the ongoing fourth industrial revolution based on efforts to digitalize and automate factory operations as much as possible. In the case of PRAKAB, this meant focusing on unnecessary losses of precious metals (especially regarding the annual consumption of up to twenty thousand tons of copper) which caught the attention of the leading magazine Forbes, which reported on the project in depth in 2018. It is a kind of internal GPS network, with each coil of wire fitted with a chip and its movement monitored by special sensors (anchors) placed throughout the site. The system thus knows exactly where and how much material is currently located and what is happening to it. The company's savings after the introduction of this application have amounted to millions.

Similarly, issuing records about finished cables that are wound on drums, which the company is storing in many places on its land, is approached in a modern way. Finding the right drum for the given customer on a huge plot of land would be complicated, but now there are QR codes on each drum and these codes are scanned by forklift cameras. These are linked to the system containing all the necessary information (where the drum is, when it was stored there, what type and what length of cable is wound



Award for 1st place



Award from the Aero Club of the Czechoslovak Republic, 1947

PRAŽSKÁ TOVÁRNA NA KÁBLE

SPOLEČNOST S R. O.

Kancelář
V PRAZE II., Vaclavské nám. 49.
(Pulcův Atrium).

TELEFON 3081, 2360.

Telegramy:
KABEL PRAHA.

Ochranná známka.

Továrna
V HOSTIVĚŘI.

Telefon:
PRAHA ČÍS. 90330.

Stavice dráhy:
HOSTIVĚŘ ČSD.

ŘÍJEN 1930.

CENNÍK Č. E. 7.

CENÍK

Ja smaltovaných měděných drátů.

Průměr mm	Cena Kč	Průměr mm	Cena Kč	Průměr mm	Cena Kč
0-05	175—	0-20	43—	0-65	28—
0-06	132—	0-21	41—	0-70	27-0
0-07	97—	0-22	40—	0-75	27-30
0-08	84—	0-23	39—	0-80	27—
0-09	74—	0-24	38—	0-85	26-50
0-10	64—	0-25	37—	0-90	26-30
0-11	59—	0-27	36—	0-95	26-20
0-12	56—	0-28	35—	1-00	26—
0-13	54—	0-30	34—	1-10	25-90
0-14	51—	0-35	33—	1-20	25-80
0-15	49—	0-40	32—	1-30	25-70
0-16	48—	0-45	31—	1-50	
0-17	46—	0-50	30—	1-75	
0-18	45—	0-55	29-50	2-00	
0-19	44—	0-60	29—	2-50	

Ceny se rozumějí s% slevy s přírůžkou za 1 kg netto, včetně daně z obrátu, z naší továrny bez obalu a bez cívek, za něž účtujeme podle velikosti Kč 1-50 až 3-50 a jež připsujeme při vrácení v nepoškozeném stavu (tranko naše továrna v plné ceně k dobru, odečítáme však Kč 0-50 za upotřebení).

Pro objednávký pod 1 kg jednoho rozměru 10%, přírůžky.

" " " 0-5 kg " " 15% "

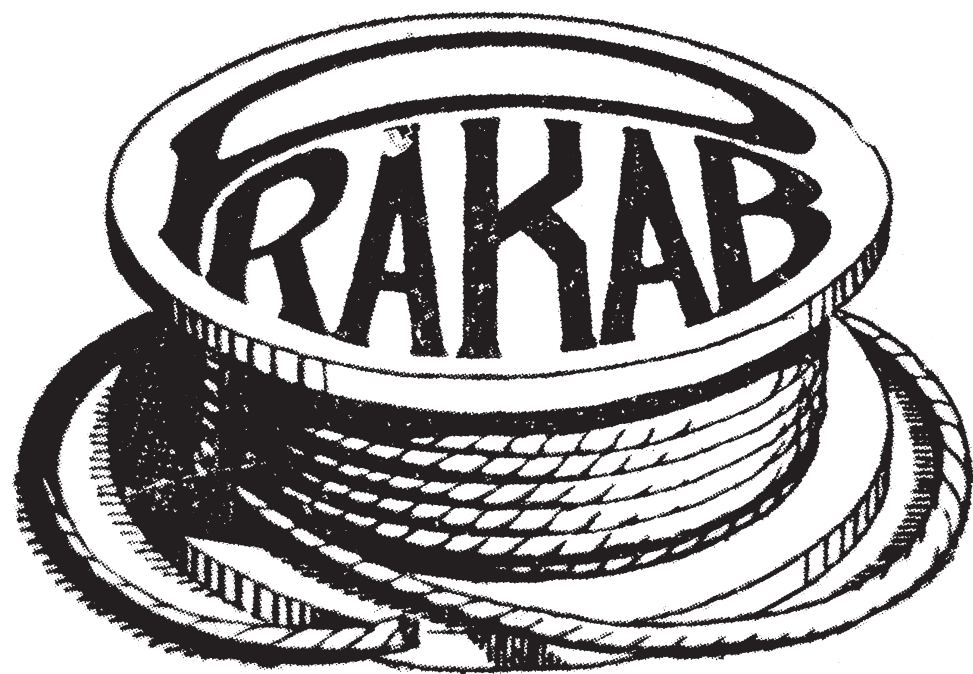
Za provedení speciálních drátů transparentních (rubinových) znočků
ER počítáme 10% přírůžky.

Vydáním tohoto ceníku pohybuji veškeré dosavadní ceny a nabídky platnosti.



Price list, Prague cable factory, 1930

PRAKAB logo used in the years 1921 - 1939



Dřevské šňůry typ DG			Kábľa pro obložkovky		
Průměr mm	Bez spádky	Se spazskou potlačou vaného dřeva, dřevu	Průměr mm	bez spádku	bez spádku
1 x 0,75	440	520	1 1/2	320	650
2 x 1,0	540	640	2 1/2	440	920
2 x 1 1/2	700	820	4 0	560	1300
2 x 2 1/2	1040	1200	6 0	720	1520
3 x 0,75	600	720			
3 x 1,0	720	880			
3 x 1 1/2	960	1120			
3 x 2 1/2	1360	1540			

Vodiče pro slabý proud.
Dráty voskované

Primeri mm	Spustanje v vrednotenje srednjega razreda	Spustanje v vrednotenje razreda optimizacije	S. skupne spustanje razredov plus	S. skupne spustanje razredov plus
0-5	85	95	90	95
0-9	100	110	105	110
1-9	110	120	110	120

Dráty čalounové

z trojnym opiewaniem baszkiem pizai
 98 cm primer RC 95 -- za 100cm

Šňůry tažilkové

Prezent	3 optatelor pentru locuitorii	3 optatelor pentru locuitorii
	pe 100 de persoane	
Industria	140	110
Transporturi	210	165
Comert	280	220

Vodící dráty izol. T

* prýdovou látkou a opředěním bavlněnou přízí

Právek mm	Industriální odpadní kg na 100 m ²	Domácí odpadní kg na 100 m ²
0,8	110	125
0,9	120	135
1,0	135	150

PRAŽSKÁ TOVÁRNA NA KÁBLE

Tolson Kenneth
Frank E. 2002 01
Tolson Lawrence
Wynne E. 4422

společnost s r. o.
PRAHA
H., Vrchlického sady 1

Mr. Tolson: _____
 Mr. Boardman: _____
 Mr. Nichols: _____
 Mr. Belmont: _____
 Mr. Ladd: _____
 Mr. Clegg: _____
 Mr. Glavin: _____
 Mr. Harbo: _____
 Mr. Rosen: _____
 Mr. Tracy: _____
 Mr. Egan: _____
 Mr. Gurnea: _____
 Mr. Hendon: _____
 Mr. Pennington: _____
 Mr. Quinn: _____
 Mr. Nease: _____
 Miss Gandy: _____

October 1921.

Ceník

**Isolovaných drátů, káblů,
žárovkových šňůr,
lustrových a haketálových drátů,
strojních káblů
a vodičů pro slabý proud.**

Dle přání posloužíme zvláštní nabídkou na abnormální vodiče jako:

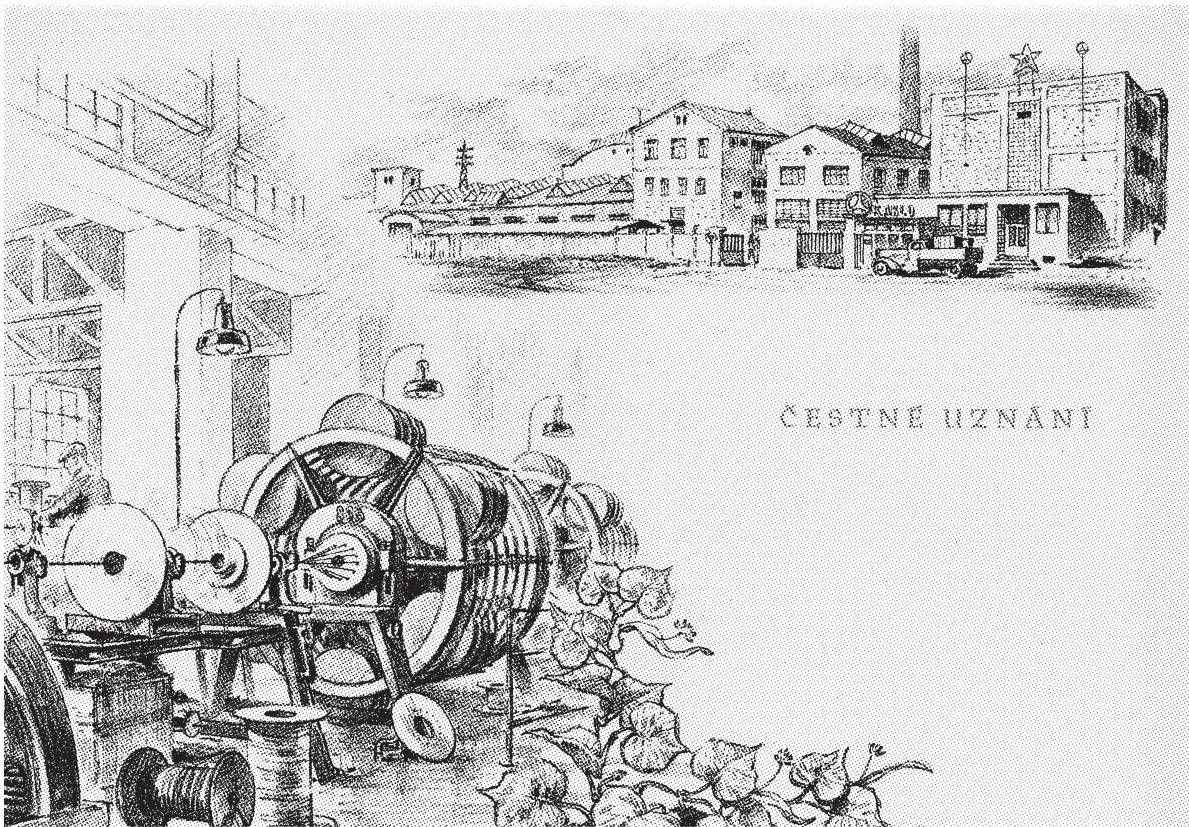
**Vodiče pro telegrafy a telefony,
dráty s pryžovou izolací**
pro pracovní napětí až do 2000 voltů

**Holá lana měděná a hliníková,
dynamové dráty.**

Ceny v tomto ceníku uvedené rozumějí se z lotariny bez odvodu.



“Best Employee” Award, on the background the logo used since the 50s



Honorable Mention

on it, etc.). The forklift itself is then navigated by the internal GPS system again to the relevant coil.



PRAKAB and SKW employees together at the Innotrans trade fair in Berlin, 2016

The years 2016 and 2018 brought another of the imaginary representative highlights in the industrial field, which PRAKAB achieved by exhibiting at the prestigious international exhibition InnoTrans, which has been held every two years in Berlin for a quarter of a century. This is the largest ever trade fair dedicated to railway operations, where the company exhibited cables designed specifically for safe train travel.

Present

And that brings us to the latest developments. PRAKAB is not only a company for cable traders, but it often intervenes in everyday life around us, even in places where we would not expect it – for example in the arts. Whether it was the professionally made artistic graffiti right on the walls of the buildings lining Průmyslová Street, thus making it more pleasant, to the illuminated whale by artist Jiří David, which PRAKAB helped to revive with its special cables and which made Wenceslas Square even more special in 2018 on the occasion of the National Museum reopening (our PRAKAB experts themselves developed a universal insulating material for cables manufactured under the trade name *PRAFla*®+ for this purpose).



PRAKAB supplied special cables for the reconstruction of the National Museum in Prague

Among activities not entirely linked to the cable company's business, we might mention that the company, e.g. sponsored the team of Martin Macík Jr. in the trucks category at the Dakar Rally, backed the annual celebrations of the Prague 15 District or co-financed the publication of a book on the history of this city district.

The company has been repeatedly awarded prizes for its ecological production and manufacturing, such as its contribution to pallet recycling. Recently, the old warehouse buildings have been renovated as well and these will soon be replaced by modern halls which our company is going to rent to other companies. Last year, our company built a training center for 49 people and reinforced cooperation with universities, or to be more precise: with the Czech Technical University in Prague and the Technical University of Liberec. We are working with them on developing new technologies and are backed by grants. Indeed, PRAKAB would be happy to support the education of new students, which is also motivated by the company's own interest. *"Prior to the Velvet Revolution, the last generation of cable engineers was trained at the Faculty of Electrical Engineering in Bratislava," says Tomáš Zieschang. "Subsequently, this study program was entirely cancelled, and graduates from this program range among the top professionals we have. We are leading very open discussions with universities, the ministry and the Chamber of Commerce, since we would like schools to reopen this relatively specific program. Today, the experts in this subject need to be recruited by a classical electrical engineer program, but when it comes to cable production technology, it proves to be a very problematic issue and if you do not study it at university, it is very difficult to break into."*



The company ships 50,000 tons of cables per year

The cable company was able to defend its stable market position even during the severe coronavirus pandemic, which affected our country at the beginning of 2020. *“Following a short hesitation lasting a few days, the management succeeded in orienting itself and keeping the company running.”* as we can read in the company’s annual report. *Despite initial scepticism, we furthermore managed not to lose our position on the domestic and foreign markets, in the energy sector and, in fact, as far as all the strategic product portfolio areas are concerned. Our company has furthermore managed to retain all business regions of interest. We can state without any exaggeration that our company did not lose a single customer during this crisis. On the contrary, our calm and stable approach has aroused the interest of customers in cooperating with us on an unprecedented scale.”* We have managed in difficult times to secure work for employees, whether they worked remotely from their homes; or sticking to various safety measures directly at the workplaces.

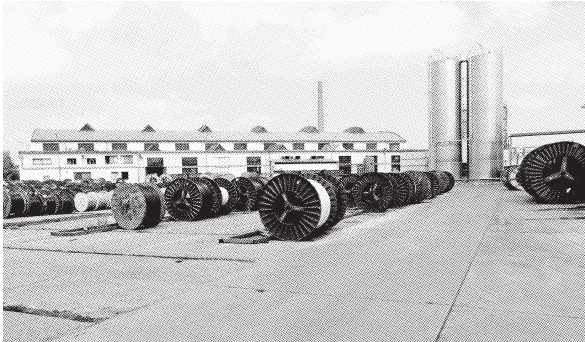


View of the canteen



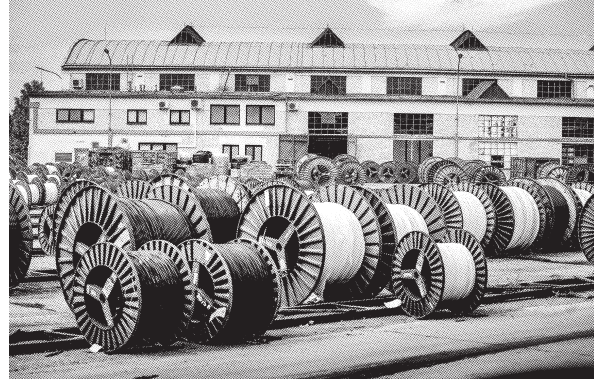
Personal gatehouse

We make modern life possible



Silo and PE storage

Summing up the last few pages, the entire post-revolutionary PRAKAB development era was very successful, because within three decades, it turned into an entirely modern, technologically advanced company with an unprecedented stable customer portfolio. During this period, the company, originally focused primarily on domestic trade, became a major player in the European market and an esteemed power or railway signalling cables manufacturer. *“Most people don’t think much about cables, but in our society where everything is interconnected, cables are literally at our every turn. The world of modern technology as we know it would be impossible without cables, and we are proud to be part of this process”* say sales director Petr Tupý, as well as Daniel Heidler, who joined Tomáš Zieschang as MD in 2020. The most interesting future products are e.g. hybrid cables (combining standard wires with optical fibers) or smart cables equipped with built-in sensors that, for example, detect cable temperature, but also shocks, sounds, damage or other mechanical impact, sending all data directly to your owners. The developers also specialize in improving cable conductivity, even into the areas of superconductivity.



The factory is able to produce 1200 cable types

At present, our company employs 310 people, with annual production reaching more than 50 thousand tons of various cables (about three quarters are to be exported), the portfolio includes about 1,200 different cable types, and the company turnover amounts to five billion crowns. We may find world-renowned PRAKAB products in many important places of our lives, i.e. not only in the aforementioned Prague metro or the National Museum, but also in the Prague-based Blanka tunnel, at Václav Havel Airport in Prague, at the Dukovany as well as at the Temelín and Mochovce nuclear power plants, at the Tábor catacombs, as well as in the Chodov shopping center or in the O₂ arena.

The company's current motto is the English slogan *"We make modern life possible"* i.e. *"We enable the modern world."* MD Tomáš Zieschang recalls how this motto was created during one evening in Vienna: *"The company's management was meeting at that time on the upper floor of one of the Vienna high-risers, and the entire capital was just lit up under them. They realized that without our company, nothing like this could work at all, it simply wouldn't exist, whether it is communications, computer networks, lighting, heating, power, anything. The power supply cable leads to everything. This is how our motto came up, and for years we have indeed been a company that really makes modern life possible."*

Interview with The PRAKABIANS

Petr Poživil taking a personal look back at a quarter of a century

In 2021, the year when our company PRAKAB PRAŽSKÁ KABELOVNA celebrated one century since its establishment, as **Petr Poživil, foreman at our Cable company**, is concluding his career as well as an important chapter in life.

Can you describe your journey at PRAKAB until today?

My start at the cable company is linked with an important event in the entire SKB-GROUP's history, the transfer of the production capacities to PRAKAB. I started working here in 1996, exactly twenty-five years ago, as a cable operator in hall C2, i.e. in the hall where communication and telephone cables are being produced today. In cooperation with SKW technologists, the machines were gradually launched into operation. As time went on, lines for producing telephone cables were added. I personally went through virtually all production lines in hall C2. After twelve years, in 2008, the company management offered me a foreman post at the cable company, where I'm still working today.

Becoming a foreman was a significant change in your career, how did you cope with it?

I'm glad that I accepted the offer. To me, it was a change both on the professional, and personal level. The hardest part was to actually start working as a foreman. Thanks to my previous work, I managed to run the operation itself well, but working with people proved to be a big challenge. You need to treat everybody in a different manner and that's something which can't be learned. You need to have a touch for dealing with people and understand them. On the other hand, don't get discouraged when things don't go your way, see things through to a successful conclusion, even if you tap into your reserves.. I am convinced that working with people today has become much more difficult than it was in the past. That's why I nominated my successor **Lukáš Schütz**. He is a young, energetic person, understands today's generation, has a strong will and is willing to go outside his comfort zone. Lukáš has been working in our company for almost twelve years. During this time, he has worked on various posts as a cable operator and gained valuable experience, which, together with his diligence, confirmed that choosing him for this post was appropriate. My fingers are crossed that he will master this difficult "art of being a foreman" with honour

Thank you for nurturing talent. From your point of view, what has changed for the better in PRAKAB?

It was definitely the start of our own PVC production, at the turn of 2014–2015. I believe it was one of the biggest investments in PRAKAB's history. Many people, across the company, were involved in its successful implementation, from the Tremmel family as owners, to colleagues in development and engineering. Of course, we must not forget our colleagues in production. The PVC production line became part of the production plant, and as foreman, I was responsible for it.

I also consider it a success that even in times when production was being reorganised, production lines were moved, despite all the obstacles, we managed to maintain continuity of production and stabilize jobs.

Looking back, what is the first memory that sticks with you?

I will hold onto the fond memory of the regular Christmas staff meeting at the Regina Hotel. I looked forward to it every year. They had their own charm, a unique atmosphere and have not lost their magic even after so many years.



Foreman Petr Poživil (left) started in 1996 as a cable operator





To conclude, what would you like to wish PRAKAB and your colleagues?

I wish PRAKAB to keep as many loyal customers and loyal employees as possible even throughout the next hundred years, which especially refers to trust. I believe that even in these times of the coronavirus pandemic, PRAKAB will preserve jobs for all colleagues and create conditions for the supply of new employees to the machines, which in my opinion are still in short supply in production. Thanks to all colleagues for the great cooperation and I wish everyone good health and happiness.

A craft passed on in the Marhefka clan from one generation to the other

At the beginning of the 1970s, Ján and Juliana Marhefek, parents of their sons Slavomír and Petr, moved to Bohemia from Slovakia. Their journey for work gradually led them all to a company called Kablo Hostivař, towards which they proved unprecedented loyalty. For half a century, members of this family have permanently occupied a post in this company. Although the parents are no longer working here today, both brothers, Slavomír and Peter, have been working here since high school. Slavomír joined in 1987 and Petr two years later. By now, Slavomír has been working in the Planning department for nine years and knows all the production lines in detail. Petr started at the electrical workshop, moving later to a testing laboratory, where he works as a quality controller of AYKY cables. The third generation is represented by Peter's son Filip.

We asked them what they remember from their childhood days.

Peter: After my parents came to Prague, we grew up here for the first few years in a company hostel. We played football on the now busy Průmyslova Street. In 1979 we got an apartment in Jižní Městě from the Kablo Hostivař company. Ten years later we bought it, and I still live there, together with my dog Jesi.

This year, when we are celebrating the one hundred years from the establishment, our company is building a new logistics center in a hitherto unused area, but also in places where there were formally buildings used as company-owned hostels, i.e. your first temporary home here in Prague. Doesn't that evoke nostalgic memories?

Slavomír: Personally, I'd say no as it's been a long time. But this will eliminate the advantage for new job seekers who don't live in Prague. When the company had been taken over by the current owners, a lot of investments were made every year into the company's technical equipment, into new machines, into the reconstruction of buildings, new production halls were built due to the expansion of production capacities. And it's simply good that there's still something going on in this sense.

What do you value most at PRAKAB?

Peter: Definitely the people, the team. I have learned a lot here during that time, manual skills, but also computer work, today it is quite common, but before it was not so.

Slavomír: Specific production humor. That's part of our daily life. This humour sometimes goes pretty far but doesn't cross the line and it doesn't ever hurt anybody. We stick together, not only at work, as we sometimes meet afterwards too. Although it is no longer as common today as it used to be. This is also due to the production increase, the diversity among people, more and more colleagues from abroad come to us and at present, there are many from the Ukraine. But nationality does not matter. Anybody who wants to work fits into the team, and those who don't, they will leave soon enough on their own.

We also interviewed Peter's son, Philip, how long have you been at PRAKAB?

Philip: I used to work here on a part-time basis during every summer holiday from the age of fifteen to eighteen. Now I have been working at the cable manufacturing site for a year and a half – i.e. in the production, as a cable operator in hall C2.

What do you like about work?

Philip: I like making cables in general, just because cables are simply everywhere, so you feel a great deal of responsibility to do everything right, even during the production.



Slavomír, Petr and father Ján Marhefka came from Slovakia...



... and today they have been working with their descendants in PRAKAB for half a century

What do you value most at PRAKAB?

Philip: As far as the time is concerned since I've been here, I have to say that the team is great. The colleagues are happy to help you, advise and teach you. This is what enables you to work with a smile on your face.

You are the representative of the third generation of Marhefkas in PRAKAB. It was your grandfather Ján and his brother Milan who “started the baton” forty-five years ago and worked here for an incredible thirty-four years.

Philip: My colleagues told me about my grandparents at PRAKAB. I know what lines they worked on and that they were handy. In fact, when I walk by the machines, I often imagine them standing there.

Do you think the next generation of your family will work for the company as well?

Philip: It's quite possible! / laughs / I wouldn't be surprised if my children worked here at some time.

When still a boy, Jan Švec, was taken by his father Karel to the seventy-five year anniversary celebration and today, he is a foreman in the AYKY cables hall.

What were your beginnings in the company like?

I have been working at PRAKAB for thirteen years. I started as a technician in the test room. Thanks to the reorganization, I then worked as a foreman in the production of silicone cores, which was then still in the braid shop, now moved to the cable factory. The cable factory also includes our own production of PVC granulate, which we started at the end of 2014 together with Petr Tupý, Radomír Jankot and Zdeněk Štěrbá. I have worked on the PVC line for over three years and now I am starting as a foreman at the AYKY hall.



Švec's have been working in the company for three generations; here at the celebrations of the 75th anniversary of PRAKAB

How do you master the “art of foremanship”?

It's something completely different. Kind of the view from the other side. As a cable operator, I virtually went through the entire production, but being a foreman now, I'm into this facility's planning, work organization, I'm communicating with colleagues, focusing on technology, maintenance. And I'm figuring out how extremely important communication is.

You are the third generation of your family working at PRAKAB...

It is true. My grandmother worked here before me in the administration and my father, Karel, was employed as a mechanic,

a foreman at the pulling plant, then he produced silicone cores and afterwards, he went to the tool shop.

If you agree, I would like to focus for a while on your father, Karel Švec, who worked at PRAKAB for almost twenty-five years in various positions. In addition, he was an active trade union member.

My dad worked as chairman of the trade union and, together with his colleagues, they built a strong trade union in the company. In 2019, he handed over the trade union presidency to David Lavička. His main motivation was to help others. He wanted everyone, irrespective of his/her post, to have a good time in the company. I think he did it quite well. People stood behind him. In spring 2020, he retired. Dad was looking forward to his retirement, counting down the days, but in a few months he returned to PRAKAB on a part-time basis. He helped with the measures regarding the Covid-19 pandemic and occupational safety and health.

He is not the first person reacting like this and we hope he won't be the last. People like to get back here or "hand over the reins" to the younger generation. Wasn't that the case with you?

When PRAKAB was celebrating its 75th anniversary twenty-five years ago, my dad and I were here when I was a little boy on the open house day. At that time, I would never have believed that I would be taking a part-time job here after school and staying on. I studied mechanical engineering and needed to gain practice and experience. My dad immediately directed me to PRAKAB. I didn't intend at first to stay that long. Yet something interesting always came along my way. It is precisely the changes and the option to constantly learn some new things what I am grateful to have remained here. And I really appreciate all my colleagues.

What has changed during that time for the better at PRAKAB from your point of view?

I welcome the ever-improving ecological thinking of the company, waste sorting, waste minimization. It's becoming increasingly important.

In conclusion, what would like to you wish PRAKAB for the next century?

I wish for PRAKAB to have a sufficient number of orders and that the company grow and have a good reputation at home and abroad.

Emilián Skřivan does not measure life in decades, but in deeds

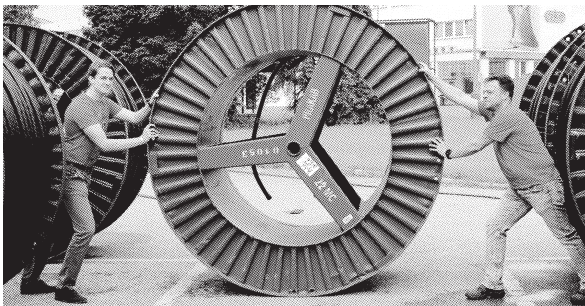
A patriot and enthusiast who hasn't left anybody at PRAKAB alone during the last twenty-eight years. He is always willing to help colleagues regarding technology, business or production. When a crisis situation occurs, he is also capable of substituting the production line operator. CYKY cables are his matter of heart, and communicativeness as well as friendliness are entirely natural to him.

How did your career at PRAKAB look like?

I started working at this company in April 1993, when I went through the production sites “from scratch” – from working at the stranding line to the insulating a sheathing line within the installation cables facility. After almost twelve years of experience, I got an offer to try a production foreman's post, which I did for almost seven years. Thanks to organizational changes, I again switched to the AYKY power cables production lines. After two years, my steps led me to the technology department on a production technologist's post, where I have been working for eight years by now.

What do you favour most about your job?

First of all, a functioning team. I appreciate the independence, the trust expressed by the high degree of autonomy, in dealing with operational matters. I like the communication with colleagues in the entire company, as well as with our partners. You get an opportunity here to pass on the acquired experience and practical skills to colleagues. The option of participating during the testing of new cable types or those produced as a standard produced, repeated tests is also great. But also participating during the tests of new production materials and technologies processed by the research and development department is superb.



Emilian and Dominik Skřivan

What pleased you at PRAKAB?

Talking about the recent years, it would certainly be a practical introduction into the production of CYKY installation cables with coloured distinguishing stripes – all this cooperation with the research and development department. Revitalizing and optimizing production lines after moving between individual production halls.

What has changed during that time for the better?

Machine and tool equipment at individual production lines, production materials, orderly workplaces, order on the company's premises, clear production, production documentation, digitizing production and many other things.

In conclusion, what would like to you wish PRAKAB for the next century?

For the future, I wish everybody the best of health – not only for myself, but also for my loved ones and colleagues. If there is still enough orders and business opportunities to do this, during which we will be able to show our qualities and place on the market, and if there will be a few nice colleagues, it will be even better for PRAKAB.

Světlana Sommerová

Světlana Sommerová follows in the footsteps of her family and has been working at PRAKAB for 35 years

I joined PRAKAB in 1986, so this year I'm celebrating thirty-five years of being at this company. Gradually, I worked up my way up to the post of a senior sales officer.

I am a representative of the third generation of our family linked with PRAKAB. My grandfather worked here from a young age, as a worker in the drawing hall, for about a respectable thirty years. My grandmother worked in the wire braiding hall for about twenty years. Then in 1955 she joined the administration, and my mother worked there for forty-five years until 2000, when she retired. And my husband was also employed here for eighteen years.

What has changed? In the past, PRAKAB was somehow a family business, and frequently, entire families worked here. Unlike today, when the world is crammed with technology and computers, we have, for example, kept records of cables on paper cards, including all information about unwinding and transport.

Throughout the years, my work has become part of my life, but it's not just work, it's also my hobby. I would like that PRAKAB have at least the same position on the Czech market as it has had so far, and certainly also to have the same kind of satisfied employees and customers.

Milan Vitvar

I have been working at PRAKAB with a break since January 1, 2000. I started as a production foreman, but I was not entering into



Milan Vitvar came to the factory 20 years ago from Kablo Vrchlabí

the unknown, as I came here from the competitor Kablo Vrchlabí at the foot of the Giant Mountains, where I'm from and where I had been working in a similar position as a foreman-planner since 1997. In 2004, I received a "promotion" offer to become head of a plant at a transport and waste management company in Říčany, so I left PRAKAB for exactly three years, but in 2007 I was "drawn" back to Hostivař by the production director. I returned enriched by my experience not only in waste disposal, dealing with the authorities, but I also acquired an economic mindset that the department I lead always be profitable. After returning, I worked as a foreman for a few months, but then I took over the planning department and after another few months part of the (AYKY) production. However, that was not the end, and in about one year, in addition to AYKY planning and operation, I also started taking care of the wire drawing hall and later on even the entire manufacture as the manufacturing manager. During the more than twenty years I've spent at PRAKAB, I also led the rewinding department. Since 2020, I'm in the planning department, where I'm still working today.

As I have already said, I come from Vrchlabí and from a cabling family. My mother and my father also worked in a cabling business. My father was a production worker and my mother was in the economic department. If anybody at elementary school would have told me that I would be spending most of my life at the company where my parents work, I would definitely not have believed them, but as it usually goes, a gradual connection with this industry began. First, there were those children's summer camps organized by Kablo to both the Czech Republic and Germany, at the age of sixteen and seventeen I came here for the summer vacation to physically work on a rounding brigade, where my task was to spin various products into circles. And in 1997 it started outright...

I am glad that now I'm able to pass on my many years of production experience to the planning department, where knowledge of the assortment as well as of the production is very important.

And my wishes? To know that there's constant pressure being exerted on profitable orders so that I needn't worry about not having anything to schedule for production.

Pavel Vokál

My name is Pavel Vokál and I have been working at PRAKAB for twenty-three years.

In June 1998, I joined the newly built AYKY hall as an operator at the E153 sheathing line, which is, as one of the few lines in the company, still in its original location. Throughout the years, I have occupied various production posts ranging from a line operator over a shift foreman, operations manager, operations manager, foreman up to my current position of a planning specialist at the SCM department.

I am a member of already the third family generation of the Vokál family at PRAKAB. The first Vokál generation came in during the year of 1951 thanks to my grandfather. He started working at the then Hostivař cable company and spent forty-four years there until 1995. During this time, he tried several positions. Zdeňka Vokálová, my grandmother, followed him in 1963 and she joined the braiding hall taking the post of a quality controller. She worked there for thirty-one years until 1994.

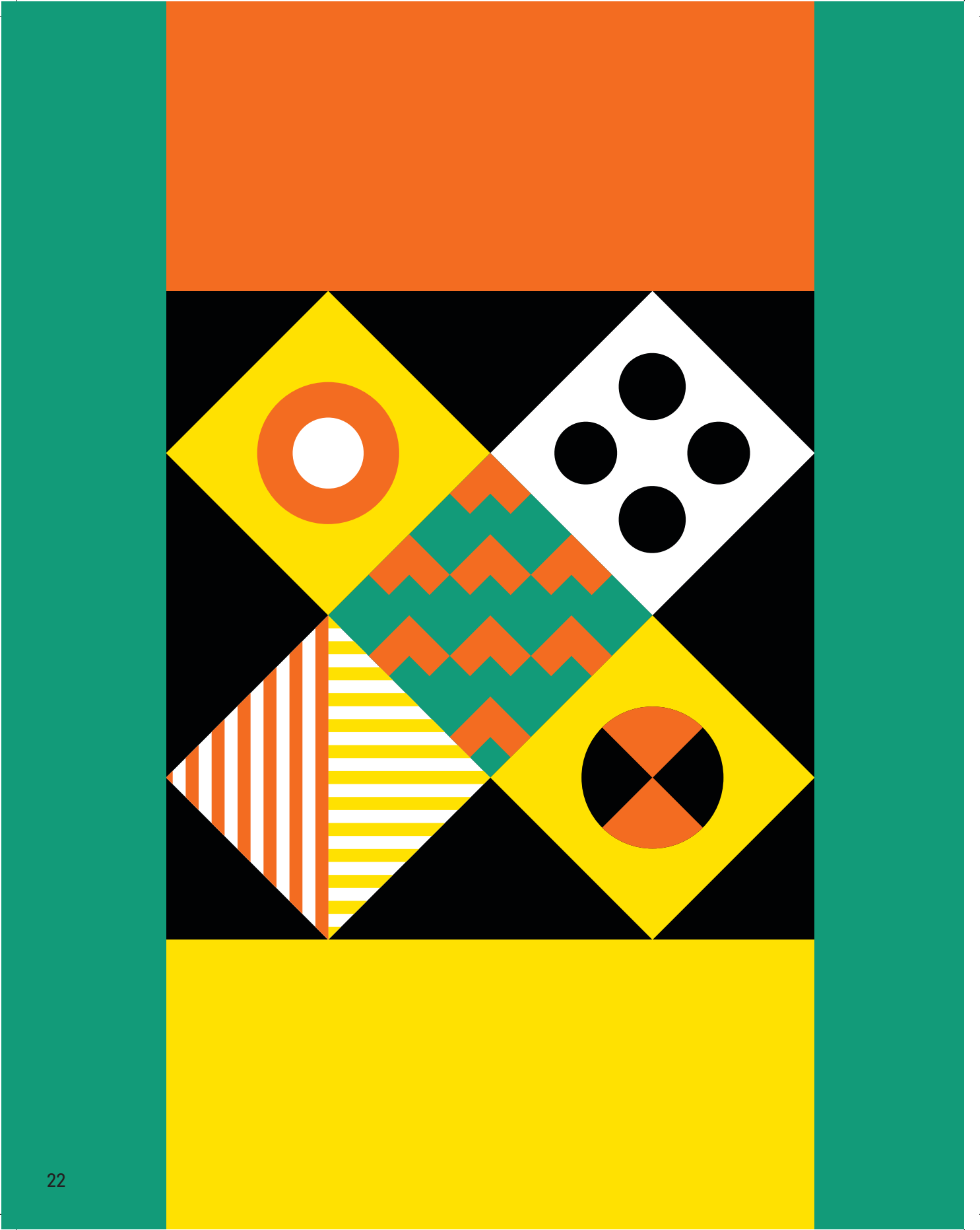
In 1968, my father was a member of the second generation and started his apprenticeship at Kablo Hostivař as a mechanical locksmith and after his apprenticeship he worked in the maintenance department in the hall at the threading house and subsequently, he worked at the UPCAST wire drawing machine and also on several other lines. He retired in 2015 after having worked for an incredible forty-seven years at PRAKAB. It is no coincidence that he met my mother Eva, who spent seven years here since 1972.

So I'm the third generation of the so-called Vokál-PRAKABák-guys. It sounds unbelievable, but my family has been working here for a total of 152 years.



Pavel Vokál – his family has been working in the factory since 1951





A word by the current Director

Tomáš Zieschang

A special place, a special time. An old factory on the outskirts of a big city. A big city that is my home and which I know pretty well. But the suburb of Hostivař had so far been a stranger to me. I used to just pass through. In fact, nothing drew me here, an old, almost closed industrial area, a classic “brownfield” at first impression. Well-known factories long since closed down after failed privatisations or due to a lack of interest in running them in the expensive area of Prague. the Průmyslová ulice, i.e. the Industrial Street was once a perpetually clogged artery, but that has changed, replaced by motorways and other connecting roads. As a native of the centre I didn't know many things here, the central incinerator, the shopping centre, perhaps the headquarters of the Prague Sewerage Company. One knew something about Zentiva.

However, the Prague Cable Company or Kablo Hostivař is something else. Well-known names, a well-known brand and a great tradition. Only I, as a layman in the cable industry, did not realize where this company actually is and where it works. I didn't look for it in the little valley below Průmyslová Street, almost



The modern world is not possible without cables, says the director
Ing. Tomas Zieschang, Ph.D.

imperceptible behind the old sheds, with the old chimney, with the buildings standing diagonally between other businesses. A long journey around the world and for work brought me back home, years later, to Prague and to this old Prague lady in the suburbs. They have returned it to its original name, PRAKAB, the same name it had when it was founded in 1921. I never dreamed that I would ever come here, that I would work here. But that's precisely what happened.

Indeed, this one is a special place, a hundred-year-old building literally oozing modern technology. It doesn't appear like that, but even during the darkest part of the night, the granulate made in the central distribution systems keeps rustling here. The factory works on a 24/7 basis, day and night. It's shut down only at Christmas for two weeks in order to repair everything that might have broken or worn out, and then it starts moving again. The plant has been working this way for an entire century. During the First Republic, during the Second World War, after the Communist takeover, during socialism, during normalisation, during the Velvet Revolution, after the Velvet Revolution, after privatisation and even after 2000, it is still in production. Cables are still being made. It's an unprecedented miracle, one place, no interruption and still the same industry. And these people, the workers, the businessmen, the economists, the technologists and the developers, for generations have been working here. Most of them will never let go of their factory. And it's hard work, often dirty, arduous, with uncertain results. It's as if no one here minds, it goes on and on, faster or slower, but surely on. As if the place were cursed or enchanted. An invincible genius loci.

I like factory environments, operations where people create new value through their work. The noise of machines, the smell of oil, metals, plastics. I like the way a classical factory works, the shift starts, the offices work together hand in hand with the production division, the gatehouse and the guard service. It's a world that seems to have come to an end in recent years. Modern times are no longer keen on it, yet unaware that nothing works without it actually. Nothing works without cables, nothing will work without responsible work and maybe even without the PRAKAB cable company. The company successfully passed the last difficult test last year in 2020. A pandemic hit like no one had ever experienced before. Fear, restrictions, lack of information and contagion started spreading across Europe. No one knew what would happen and how to deal with it. At our plant, this took just a week and we already knew that we would have enough work,

people always need cables. We took measures, set up health checks and continued our uninterrupted production. Once again, PRAKAB did its job, it came through the pandemic without any loss, looked after its employees and even earned something for its owners. It went into the next few years without a shudder.

Making a decision is very difficult for the director of such a company. There is a great tradition and enormous opportunities to do something wrong. Everything needs to be done carefully and prudently. However, this does not mean that the factory shouldn't strive for further development. Product innovation, state-of-the-art laboratories and new technologies are prerequisites for successful continuation. Likewise, it is important to properly use the land. Therefore, the factory does not remain unchanged. Investments are being made, demolition works are going on and new buildings are being constructed. People often ask me whether I am not afraid of making a big intervention in the traditional customs of this business. I answer that I am not afraid of interventions, but it is necessary to do them sensitively, with respect for tradition and with an eye to the future. To do them in harmony with my fellow workers and to keep in mind the spirit of the place. Do them for the next hundred years.

Greetings

Dear Sister, your vitality and longevity is a positive role model and source of inspiration to us, you have been and are our respected elder sibling, a fountain of knowledge and we will be happy to accompany you on your journey to your next historical milestones.

Your teenage sister wishes you a successful pilgrimage at any time, on board with a capable crew.

Štefan Kňaško
CEO ICS

The 100th anniversary of the foundation of the company is certainly a significant event. Not every individual or company is destined to live to see this anniversary.

PRAKAB, thanks to all of you and the current management, has succeeded and you can be rightly proud of this anniversary. This successful history was written by you – people from Kablo. It can be rightly stated that thanks to your efforts, your company is today economically, productively and technically strong, well-organized enterprise, which can withstand in comparison with similar enterprises throughout Europe. It was certainly not easy. Back in the 1960s, this cable company was destined for extinction. Mainly thanks to the directors Ing. Emil Buchlovsky and Ing. Vladimír Kelner, this threat was averted and from the 1970s onwards, investments were made in this cable plant, thus stabilizing it. Thanks to this fact, the new owner from Austria could in 1992 state that he is pleasantly surprised by the production and technical level of the cable company. The modernization of the company continues under his management. A number of new products have been launched on the market and are competing successfully on foreign markets. In conclusion, I would like to thank all those who have contributed to these successes and wish the entire team of “PRAKABIANS” stability, success, satisfaction and continued good health. You have every right to be proud of your PRAKAB company.

You have achieved a lot, so keep going.

I will keep my fingers crossed for you.

Ing. František Herman
former director of PRAKAB

On behalf of myself and on behalf of the Association of Cable and Wire Manufacturers of the Czech Republic and Slovakia (AVK), I would like to wish PRAKAB many more successful decades in business on the domestic and foreign cable market.

Coincidentally, this year will also mark 25 years of successful joint cooperation between AVK and PRAKAB, aimed at shaping and promoting the basic directions of the cable industry, where PRAKAB, through its owners, executives and technical experts, has always initiated and shaped ideas of general benefit to the entire industry and then effectively promoted them so that the cable industry helps to develop our entire society, quality of life and protect the environment.

I greatly appreciate the efficient, yet ethical way in which PRAKAB's management has been able to link its interests and goals with the needs of the entire cable industry, including cultivated cooperation with other companies operating in the market and in the entire supply and customer chain.

I am confident that PRAKAB will continue its experience-rich, long-standing operations successfully in the next period of its unique existence, and that the results of its work will inspire joy and pride in all employees and managers, while benefiting from the joint activity the whole company and the entire cable industry.

I wish everyone much inventiveness, empathy, determination and purpose in the years ahead.

Ing. Miroslav Trojan

President of the Association of Cable and Wire Manufacturers
of the Czech Republic and Slovak Republic

Wer 100 Jahre alt wird, hat Wirtschaftskrisen,
Kriege und nun auch Pandemien erlebt und überstanden.

Als Mensch wie als Unternehmen.

Diese Widerstandsfähigkeit der Firma PRAKAB – entstanden durch
echtes Unternehmertum, Teamarbeit und technische Kompetenz –
ist die beste Basis für eine solide Zukunft.

Ich wünsche PRAKAB weiterhin viel Erfolg als bedeutender Player
auf dem europäischen Kabelmarkt und danke dem Unternehmen
für seinen langjährigen Beitrag zur österreichischen und
tschechischen Wirtschaft.

Roman Rauch

Commercial Council of the Austrian Embassy

One hundred years in the development of a company is a significant anniversary that few companies live to see. It was an honor to be able to actively participate in almost the last third of PRAKAB's life, the period of greatest investment and market expansion. Under the leadership of its Austrian owners, the company has become a modern production facility and a major player in the Central European cable manufacturing market. I would like to wish PRAKAB further production development in the years to come, new innovations and expansion on markets not only in Europe.

Ing. Jaroslav Krňák
Former CFO of PRAKAB

The Prague 15 Municipal District has been cooperating with PRAKAB for a long time and we are glad that we can be partners. 100 years is an age that inspires respect, and looking back there is a lot to look back on. There is a time and space for evaluation, but also for planning and conquering further metres. On behalf of the Prague 15 municipality, I wish everyone at PRAKAB that their look back will be enjoyable not only in terms of business achievements, but also in terms of the people who form the heart of each company. And at the same time to be an instructive path to new successes. Let me also express my wish that PRAKAB will continue to be a partner and part of Prague 15.

Mgr. Jitka Kolářová
Deputy Mayor of Prague 15

Technical Dictionary

Basic Terms

Types of cables and their purpose

In order to be able to define which cable we need, we must first know what the cable should transmit (energy, data, or both, and also in what form, or how intensively/quickly), and where it will be placed, whether in the ground, in a cable duct, in a building, on devices for flexible location equipment, on products/equipment that have special user requirements, but also for demonstrating compliance with the requirements.

What the cables transmit depends on how the energy or information is arranged for "transport". So we are talking about:

transmitting electricity, i.e. an electrical power system and distributing the electricity to appliances that convert it into motion or radiation (light, heat, etc.); basically alternating voltage/current with a frequency of 50 Hz and voltages from 200 V to 35 kV and more

transmitting signals and data, peripherals turn input information into electrical or optical pulses of different frequencies and different "coding" so that the information can be transmitted over a given distance. The output side must be able to "restore" the original information to the input level (or with a defined deviation)

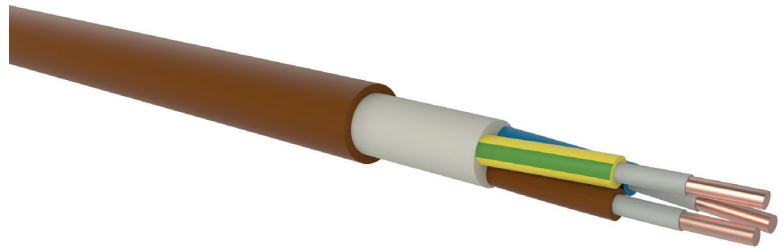
But we can also talk about a combination of these transmissions, for example, on different transmission frequencies (e.g. connecting airplanes to jet bridges at airports).

The transmissions described above naturally take place in interaction with their local environment. The transmission itself can affect the environment by standard operation (creating an electromagnetic field) and by reactions or the consequences of the reactions of the cables themselves in the event of extreme situations - especially accidents. On the other hand, physical, chemical and biological aspects from the environment can also affect the transmission taking place in the cable, and these aspects can affect the transmission so significantly that it prevents the restoration of the original information inserted into the line.

Transmission elements

A transmission element is a basic unit used to transmit power or information in the form it is meant to be transmitted. The element therefore comprises not only cores designed for transmitting power, but also symmetrical pairs (twisted cores with a defined length of pitch - twist), symmetrical fours (four cores twisted together in a "crossover" pattern or as two pairs twisted together, again with defined twists). The transmission element can also be a coaxial pair, where one conductor of the two (wire or cable) is in the middle of the conductor of the other one, which is in the shape of a tube around the conductor of the first one (known from the connection of television antennas). In the case of optical cables, the transmission element is a single fibre. There are basically two ways to twist symmetrical pairs and fours. Twisting them in one direction along the entire length of the twist, or the twisting directions change within the length of it (so-called SZ).

In the case of transmitting information, the transmission element is the basic building block of the cable that determines the ability of the cable to transmit data/information always with reference to terminal devices that transform signals representing data or information for transmission purposes.



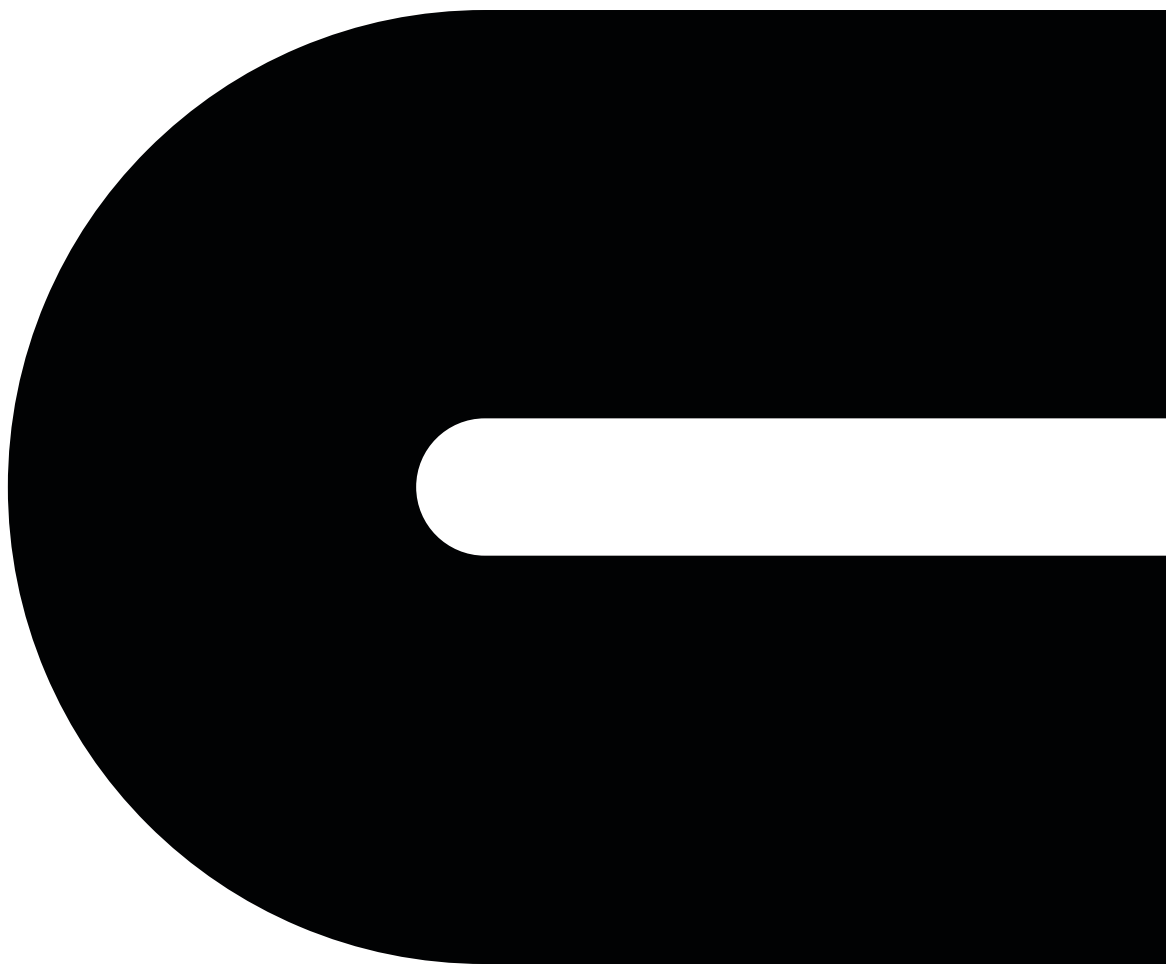
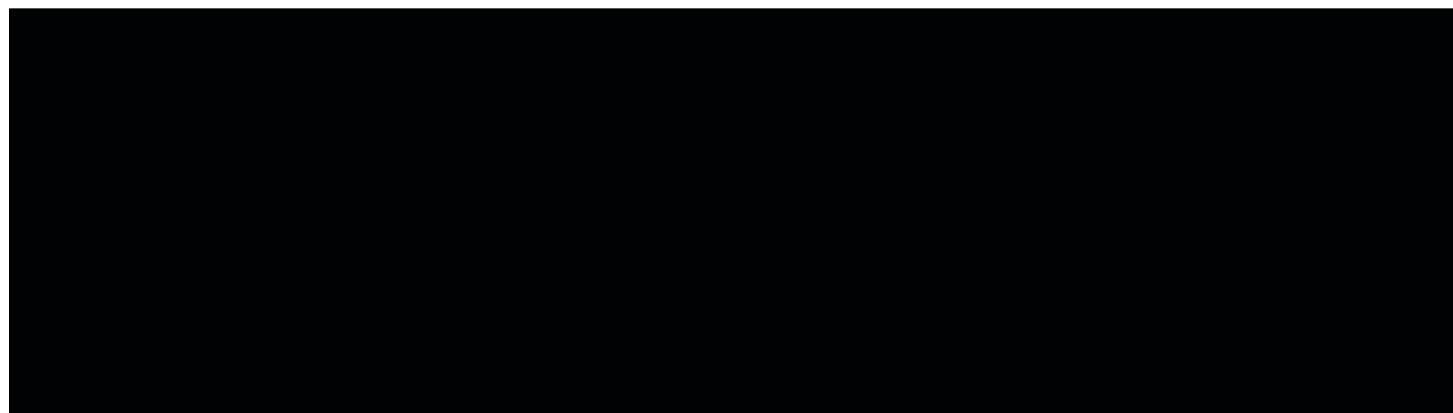
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The gradual construction of an electricity transmission system means creating an increasingly interconnected and larger network of interconnected power plants, transformer stations and distribution points. A major breakthrough occurred by connecting individual regions and by connecting continents with undersea cables. The development and deployment of these cables makes it possible to say, without much exaggeration, that large parts of the world have been connected by an interconnected electrical network. With all its resources and appliances, such a network is today the largest machine created by human society. These are big systems and almost all the people on the planet are dependent on them. To get an idea, the European continental system covers more than 30 countries.

The electrical network is such a huge thing, connecting a tremendous amount of conductive elements, that it even has its own storage capacity. This means that other sources of electricity, as well as other appliances, can be connected to this network without the need to change anything in the network. Its large material mass accumulates or releases energy on its own. Problems occur only with a large increase in power supply or high peak consumption. At these moments, the network needs to be managed. Operational centres are used for this purpose by connecting and disconnecting other sources of electricity as needed. Reserved electrical power, which allows electricity distributors to better distribute consumption at individual points in the system, is also used for this. Large consumers therefore pay a kind of fine for exceeding reserved capacities. This is because it is very expensive to provide more power unexpectedly without ordering it beforehand. Today's electrical system already transmits alternating current exclusively, but there are completely modern considerations for the introduction of a new direct current system, namely in connection with long-distance transmission using superconducting materials or in connection with the greater increase in the number of DC-powered appliances. Whether it involves computer technology, LED lighting, factory technology, but most importantly electro-mobility and train tracks. Renewable energy sources like wind and solar power plants are a major problem in managing the current system. Here, uncontrolled energy is created that the system is often unable to absorb. When the wind is blowing a lot in a certain region, it is necessary to disconnect local wind farms because the energy they create exceeds the storage capacity of the system. When there is no wind, their energy is missed and there is nothing to replace it with. Large controllable power plants must therefore be connected to the electrical system. Nuclear power plants seem to be the most advantageous here. The current debate on renewable sources, nuclear energy and the carbon footprint of coal-fired power plants is all the more interesting because these are interconnected technical problems of the whole system that cannot be solved on the basis of political wishes alone. In order for the electrical transmission system to work well, different transmission voltages need to be used in individual parts and sections. Thus, the system can be divided into high, medium and low voltage sections. It is necessary to explain the relationship between the terms "system" and "grid". The electrical system consists of all energy sources, transformer stations and the power grid. The power grid is therefore only an important part of the system. Furthermore, the system is divided into a transmission system and a distribution system. The transmission part provides the transmission of energy over long distances and is interconnected into a kind of mesh across continents and uses a very high voltage for transmission. In Europe, for example, normally 400 to 220KV. The distribution part of the system, in turn, distributes energy among customers over short distances and uses medium voltage up to 52 kV and low voltage up to 1 kV for it.

For simplicity and imagination, high voltage is transmitted in lines running from power plants to large transformer stations. From these stations, the current is then transmitted through the distribution system to large urban agglomerations or to industrial areas. Here, it is again transformed into low voltage and transmitted to local transformers already deployed in the streets of individual municipalities. From there, the current is distributed by cables to connections in households or buildings as 230 or 400V. A very important parameter of any AC transmission system is the frequency of the transmitted AC current. The system must provide a relatively accurate guarantee of the frequency to which it is set. Regardless of whether the electrical consumption point is a household appliance or large industrial machine, they are designed for a certain frequency of the incoming alternating current. They either do not work at all with a different frequency or have limited output. In Europe, the sources of the transmission system and its entire regulation are set to a frequency of 50Hz.

Transmission systems for what purpose and why, the largest machine in the world, high, medium and low





CABLE

Location of cable lines

Installing in the ground and in cable ducts - the sufficient mechanical resistance of the cable is required here, keeping water from seeping in between transmission elements, protecting it from chemicals and biological action. In some designs, protecting it from the longitudinal penetration of water in case of damage to the cable sheath.

Overhead lines - here sufficient tensile strength (the weight of the tower or pole also taking into account possible icing), UV radiation resistance, mechanical resistance to specific effects, e.g. gunshots, are important.

Installing near strong electromagnetic fields - protection provided by a conductive grounding sheath (copper or aluminium wires, copper strip, metalized strip).

Installing in water - special designs resistant to water penetration, hydrostatic pressure, current, seismic and other forces when laying the cable on the seabed or in swamps.

Installation in contact with food - the surface of the cables is made of tested and non-hazardous materials.

Installation in environments with aggressive chemicals.

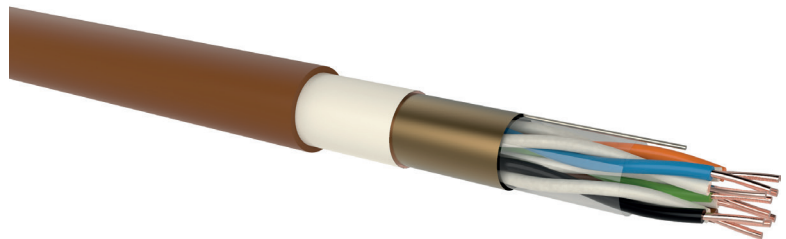
Installation at nuclear reactors - cable materials must not degrade excessively in an environment with excessive radiation.

Installation in an explosive atmosphere - the cable must not be a source of discharges caused by static electricity.

Installation in a vibrating environment and moving lines - the design of the cables must withstand vibration and movement, mainly concerning the construction of the conductors themselves with the use of string conductors of various "fineness". Here, we can imagine the representative case being robots on a factory line (e.g. in a car factory).

Used in transport (specific requirements for automotive, rolling stock, aircraft and ships) - specific requirements for operating temperature ranges, fire resistance in the cables of equipment needed for emergency operations, resistance to various chemicals, resistance to vibrations of varying degrees

Cables for construction and public buildings - in buildings it is mainly about minimizing the risks people face in case of accidents (fires), where the cables must not be the source of fire and must not produce toxic gases when they burn (represented primarily by halogen elements and their compounds). They must not generate excessive smoke (to aid in saving people and extinguishing operations) and specified lines must continue to operate for a certain period of time even in a fire. In the construction industry, the cables themselves, including supporting systems, are considered cable lines.



PRAFlaGuard F 5x2x0,8

Copper is the most widespread transmission medium. It is used to transmit both energy and information and data. The advantage of copper is its optimal combination of relatively low resistance, workability into the required form (wires, cables, plating) and its availability mainly because of affordability. If the copper conductor is in the form of a cable, it is also suitable for vibrating environments, or if the cable is sufficiently fine, then it can be used for movable settings (e.g. for robots). On the other hand, wire strands are a factor increasing the complexity of the technology needed to achieve transmission properties for data cables of higher categories, not to mention the production costs (cross-section range - 0.07 sq mm - 240 sq mm).

Aluminium is used almost exclusively for transmitting electricity. Although it is cheaper than copper and also relatively lighter, it has a higher specific electrical resistance and, from the point of view of use, less advantageous mechanical properties from a cross section of 1.5 sq mm - 250 sq mm.

Steel wire with a Cu layer on the outside is rarely used in cables (especially coaxial), where there is a so-called skin effect connected to the transmission system (the highest density of the current is on the surface of the conductor where the Cu is; the advantage of this solution is the higher tensile strength of the cable and a cheaper conductor).

Plastic optical fibres are used for short-distance data transmissions within individual devices. The fibre tends to have a diameter of 1 mm.

Glass optical fibres are single and multi-conductor, an active diameter of 8 or 50/62.5 micrometers with a standardized diameter of primary protection (plastic applied during fibre production and limiting the formation of micro cracks by thermal shock, thus ridding the glass of brittleness and breakage).

The most commonly used insulating plastic materials are based on polyolefins (polyethylene of various densities and properties, polypropylene), PVC, silicone, Teflon, etc., but are always carefully adapted to the transmission, environment and production efficiency.

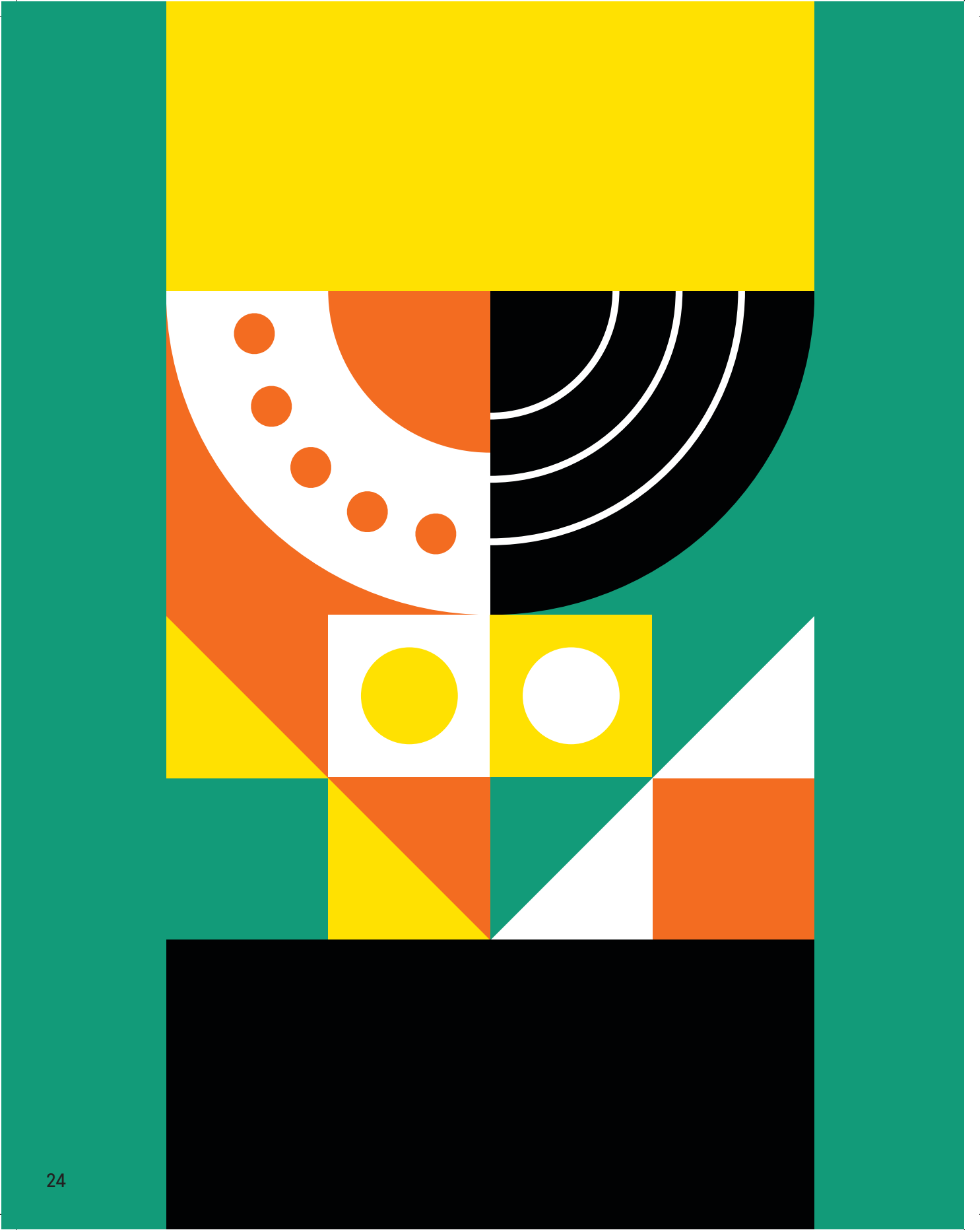
Production technology and effects on the transmission parameters of cables make it possible to consider extruded plastic insulation, as opposed to the previous solution, as a basic generational change comparable to, for example, the advent of electric locomotives after steam locomotives.

The cable core is created by stranding the transmission elements. The individual elements are also stranded, the reason for stranding in this case being the flexibility of the cable (cable systems and cable wiring are practically never straight along the entire length of the cables) and the method of stranding likewise serves (together with colour coding) for orientation when connecting cables together, thus figuring out which cores belong to each other at one end or the other end of the cable.

From this point of view, the usual structures are positional (the cable elements are stranded into positions - layers) or grouped together (the elements are first stranded - the term "filled" is also encountered here - into units and the core of the cable is made from them). The cable core can contain identical transmission elements, but also transmission elements for different types of transmissions and, in extreme cases, also different transmission media. From a practical viewpoint, the cable core can also contain filling systems and other elements in order to achieve the round shape of the cable, restricting longitudinal penetration of water in case of damage to the cable (and leakage in the connectors) or securing the positions of the cores and elements. It needs to be remembered here that the transmission elements of cables interact with each other in the cable core, transfer their transmission energies to each other, absorb the transmission energies of their neighbours, and of course react with the environment.

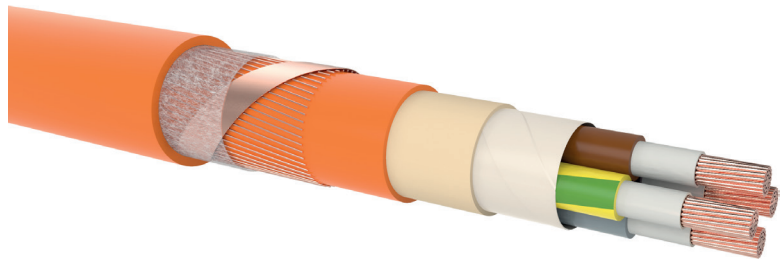
Cable core



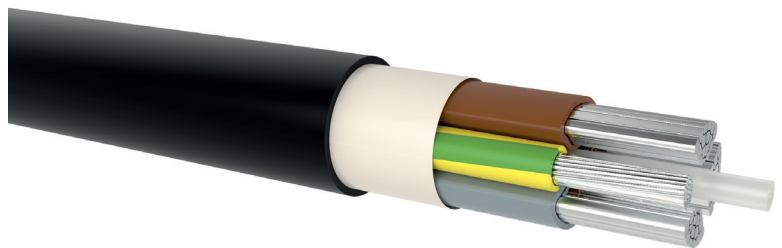


Cable sheath

It provides fixation and protection for the cable core. Sheaths are mainly designed for the type of insulation used for the cores/transmission elements of cables. In the past, these were various natural-based materials (jute) supplemented with bituminous coatings, etc. For cables with paper or impregnated paper core insulation (telecommunication and power cables up to 35 kV), lead (or aluminium) was used continuously extruded on the core of the cable (or core of power cables). Extruded plastics of various properties, always corresponding to the given purpose and use, are used in the standard cables manufactured today. It is worth mentioning the so-called layered sheath (used since the 1980s, it consists of a longitudinally laid aluminium strip with an extruded layer of polyethylene or polyethylene-based material). The special aluminium-coated foil is thus "welded" to the plastic layer during production and, in addition to having better mechanical properties, it completely prevents water from penetrating the cable core. This type of sheath is standard for virtually all installed communication and signal cables. It should be noted that in most cable constructions, a layer of plastic film or paper, i.e. materials whose task is to protect the cable core from the sheath itself, is inserted between the core and sheath. Electrical properties make it necessary to have a separation layer (insulating layer in the case of a metal or laminated sheath) for technological or assembly reasons. Making the sheath is the last production operation for many cables, so it is worth mentioning that the sheath is also used to tell us to whom we have the honour of having this cable. This can be done by printing the sheath with a standard text, or by using the colour of the cable sheath (usually to define the "behaviour" of the cable in fire conditions) or contrasting longitudinal coloured stripes.



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Cables not only have to perform their basic function, which is to conduct electric current over a certain distance, but they must also ensure that the transmission takes place safely while the cables themselves are not affected by their surroundings or vice versa. First and foremost, individual cable constructions determine the form and power of the transmitted current or current signal. The environment for installing the cable and the way the cable and its surroundings interact with each other are thus defined. In essence, mechanical influences, electromagnetic action, the effects of moisture or fire can be determined along the most basic lines. The simplest ones, such as underground cables, do not have special protection. Their protection against mechanical damage consists only of a thick plastic sheath, which has a purely protective function. The general public often does not realise that the cable sheath is only a protective feature that is removed in switchboards or at connection points of the cable and that electrical insulation is provided exclusively by the insulation of the cores. A similar protection as the sheath is provided by the rubber infill that often helps to create the continuously compact shape of the cable. If the cable is intended for places where the forces are greater and mechanical danger to the cable is expected, it is equipped with protective layers. These layers are formed by metal, often steel tapes in the case of heavy loads and armouring with steel or other wires. It is interesting that some cables are also protected against the actions of rodents, often by wrapping them with a tough steel strip. Another category of protection is electromagnetic interference. As is known, when a current passes through a conductor, it generates an electromagnetic field around the conductor. This field can affect surrounding cables or devices. Or, conversely, the surrounding cables can affect a cable carrying important information – a signal. Therefore, this protection primarily applies to signal cables and it is important in places where signal and power cables run side by side. The cables are equipped with screening layers to prevent interference. The screening layers form a kind of conductive screening sheath for the conductive part of the cable and are dependent on their design and purpose of their use. Screening can be done with metal conductive layers of stranded wires or various tapes or foils stranded around the conductive parts of cables. There are also combinations of both screening elements. Another important protective feature for cables is against the ingress of moisture. This is mainly for telecommunication signal cables, where penetrating moisture can cause a lot of damage and completely paralyze signal transmission. To prevent this, the cables are filled with a special petroleum jelly, Vaseline. This very greasy water-repellent compound completely fills the inner spaces of the cable and thus prevents the ingress of moisture between the cores of the cable. It ensures this even in the event of small break in the cable sheath. The Vaseline filling is very heavy and unpleasant to work with both during the production of the cable and subsequently installing it. In modern times, jelly compounds have been increasingly replaced by so-called swelling tapes. These are a type of rope laid with the cores during the production of the cables to fill the space within them. The strands are made of a material that swells up in the cable and thus fills the entire space and prevents the ingress of moisture. A completely different category is protecting cables from fire. Here, common insulating materials are replaced by specially developed compounds, which either do not burn at all or dampen the fire to the maximum extent. Silicone, which can be classified as completely non-flammable, is used in these cases to insulate the cores. Or they are stranded with mica tapes, which also do not burn at all. The most complex cables used in the metro or on railways are equipped with a combination of all these protections. Such a cable can have a dozen different, often very complex protective layers, and the production of such cables is a masterpiece of the cable industry.

As already mentioned, the cable and the environment it is installed in interact with each other. If we need to limit this effect, we use protection (this also applies in general and we know that no protection is 100%). In any case, it is necessary to define against what (or whom) the transmission in the cable needs to be protected and from what it is necessary to “screen” the environment through which the cable passes. Some protections are directly connected with the design of the cables and the materials used in their production (cables with defined properties in case of fire – here especially the choice of materials, vibration of the environment; the design of conductors for fine cables; some requirements for extreme mechanical conditions, etc. Other protections can be applied to cables more or less as a standard set, i.e. cables in a base sheath. Here we can mention outer plastic layers with adaptation to the given environment or very important protections against the effects of electromagnetic fields, which can significantly affect transmitted signals or, conversely, affect the environment by the transmission of electricity. These protections consist of using conductive materials around the cable above (sometimes below) the cable sheath, in the form of copper or aluminium wires, longitudinally laid corrugated copper tapes or (for flexible cables for mobile applications and vibrating environments) specially braided copper (mostly tinned) wires of relatively small diameters. The wires are usually fixed with thin steel tapes and possibly separated from the previous and subsequent layers by plastic foils. Basically steel tapes, wires and special foils protect the cables against mechanical action (even high pulling forces). A special specification is protection against rodents in the form of metal tapes or woven glass fibre tapes.

Wire drawing

The input raw material of the drawing plant is copper or aluminium wire, which usually has a diameter of up to 10 mm. At present, the wire comes in coils weighing up to several tons made by the method of continuous casting with a passivated surface.

The technological process itself makes use of the properties of copper and aluminium, in terms of their ability to be formed - drawn. After cooling down from their "production temperature", each "ductile" material has a so-called supply of plasticity (given the crystalline structure of the material), which limits the degree of its deformation (drawing). If the supply of plasticity becomes depleted and the material still does not have the required shape (in our case, the diameter of the wire), it needs to be restored. This restoration consists of "regenerating" the crystalline structure to its original state. Thus, the state of the crystalline structure before the deformation caused by the previous drawing. The deformed structure is manifested by embrittlement and hardening (in our case) of copper wires. "Regeneration" is caused by heating the material to a relatively high temperature (specific for each metal, higher than the one for recrystallization), where the metal crystals are regenerated and thus it allows further processing. This process is generally called annealing and is part of wire drawing. The supply of plasticity of standardly used conductors does not enable us to draw wires of lower diameter from the original material without restoration, and especially from the point of view of cabling we need a conductor and cores for further processing that can be processed as easily as possible and which will not introduce additional mechanical stresses into the cables. This rule does not always apply, as it differs by the type of material and, of course, also by the diameter/cross-section/shape of the conductors. The technological principle of drawing is in our case the drawing of wire by dies with a defined (and ever smaller) diameter to the final diameter or to the diameter that corresponds to the depletion of the supply of plasticity and subsequent annealing of the wire with the appropriate temperature.

The goal of the whole process then is a wire of the required diameter, cross-section, shape and defined mechanical properties. In order to take advantage of the ability of the material to be formed, the wire must be stretched several times in relatively small increments (before reaching the desired diameter or before it must be annealed so that it can be drawn further). And this is exactly where we get the design and variants of machines for wire drawing - wire drawing machines. Wire drawing machines can have different configurations, most commonly **tandem, compact and multi-pass wire drawing machines**.

At present, it is possible to buy wires for the cable industry, however, every traditional cable company still has its own drawing plant, which is, with some exaggeration, its heart and soul, and I dare say that this will continue to be the case in the future.



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Therefore, in order for current to flow through the metallic part of the cable without endangering the environment or short-circuiting to an adjacent conductor, it is necessary to electrically insulate it. In practice, this means that it is necessary to coat the metal part with a non-conductive material. Before, natural rubber, paper or some form of fabric impregnated with asphalt were used. With the development of plastics as highly non-conductive substances, the methods of insulation have also changed to this day, with the vast majority of conductive cable cores being insulated with macromolecular polymers, generally plastics. Plastics are supplied to cable companies in the form of granules, which are produced in mixing compounds either directly in the cable factory or they are delivered to the cable company by specialized companies. The granulate, which already contains all the necessary proportions of the compound, needs to be melted and applied to the surface of the metal conductor in the appropriate amount and shape. This is done on so-called insulation lines by means of an extrusion process in a device called the extruder. It is a cylindrical heated chamber, where a multi-sector and often internally heated screw rotates. There are also extruders with two screws in one chamber. The task of the chamber and the screw is to grind the granulate, which is poured into the chamber from the adjacent hopper, and melt it into a semi-liquid mass and move this mass towards the extrusion head. The extrusion head, which is directly connected to the chamber of the extruder, is actually a tool, a die in which the insulating material is directly applied to the metal wire or metal line of the conductor, which is continuously coated by the head on the insulating line. The extrusion head has several internal spaces through which the molten insulating material is extruded so that it is applied in the correct amount and shape to the metal it insulates. Inserted into the head is the nozzle and the space through which the wire leaves the head and where the tip is formed. Before extrusion starts, both must be adjusted so that the insulating material is applied evenly and throughout the entire circumference of the metal conductor in the same prescribed strength. This requires great skill of the operators. The amount of the insulating material applied is controlled by the speed of the extruder combined with electronic control of the total speed of the extrusion line. The heads are distinguished according to the size indicated by their inner diameter and thus the dimension of the conductor that can be insulated on a particular head. The two ways to use the tip are interesting. Pressure tips can be used, i.e. the insulating material is pressed directly onto the surface of the conductor and the tip actually forms only the outer surface of the insulating layer. The second way is the tube, where the tip forms the outer and inner surface of the insulating material and the metal conductor is drawn into the hollow space of the insulating material. The choice of individual methods is determined by the design of the cable and the needs of this or that insulation compound. Most of the interior of the extrusion heads is connected to a vacuum device and aspirated. This keeps air from being sucked under the insulation layer, which would form bumps, unevenness or other unwanted separations in the insulation layer. The extrusion process on the insulation line is followed by the cooling and hardening of the applied material in cooling troughs and the subsequent winding of the core on a drum or coil. The lines are equipped with measuring heads and a high-voltage tester, which verifies the electrical insulation quality and integrity of the applied material. In the case of multi-coloured insulation compounds, a second dyeing extruder is installed on the line. When, in order to save on dye, a basic uncoloured insulation layer is applied and a wafer-thin dyed layer is applied on top of it, the line is also equipped with two extruders, one forming the base layer and the other the coloured coating. The extrusion process is one of the basic technological processes in the production of insulated cables. Essentially the same principle and same devices are used in the subsequent operations that form the plastic protective sheath of the cable. These lines are called sheathing lines. Their extruders are large, there are often more of them, and one of them is the so-called rubber extruder, which applies a heated rubber filling under the sheath. The entire core of the cable then passes through the extruder heads here. On these lines, the cables are also printed with their final markings and prescribed printed text in the printing equipment installed in the line. The creation and printing of the sheath is usually the last operation in cable production. This is followed by the necessary quality control and possible division of the cable into the length required by the customer.

Armouring – cable protection

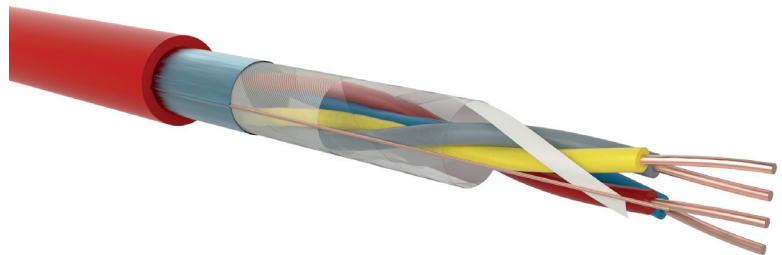
Cables generally run through different environments. The possible interactions with these environments mean requirements are needed for the separation of the cable core from the environment. The first in terms of protection is the design of the cable itself and the materials used and their nature. The basic protection of the cable is the cable sheath. Its task is to create a basic mechanical support and protection of the cable core itself. Currently, the vast majority of sheaths are made out of an extruded plastic/rubber "tube" with foil or paper close to the cable core. This was not always the case. Consider, for example, sheaths formed by variously winded bitumen-impregnated tapes or lead or aluminium sheaths used in paper-insulated telephone cables. The design of protection depends on the materials in use and state of knowledge at the time and it is constantly evolving. An effective protection against the ingress of water into the cable are so-called layered sheaths, where a plastic sheath is applied to a longitudinally formed metal strip provided with a thin layer of plastic. The thin layer of plastic ensures the welding of metal with the plastic sheath, thus creating a very standard and practical protection for installed cables. It is then possible to place additional layers above the base sheath to protect the cable from various influences. The operation in which the cable is provided with added protective layers is called armouring. Typical reasons for protection and common solutions are listed in the following overview:

- **Mechanical stress** - steel tapes of various thicknesses and widths mostly winded, sometimes longitudinally laid (corrugated).
- **Protection against the effects of external electromagnetic fields** - copper, aluminium wires fixed with steel tapes or in some cases a copper strip laid longitudinally (corrugated), in some cases it is formed by a braid of tinned copper wires.
- **Rodent protection** - steel tapes in the same design as for mechanical stress, in addition, sometimes winded in a glass fibre fabric
- **Tensile stress** - tensile elements (steel wires, cables, glass yarns) are applied in various ways above the first sheath. Another possibility is to place the tension element parallel to the cable in a common sheath (the cross-section then forms the shape of number 8). Cables with elements suitable for tensile loads can also be used for suspension.
- **Increasing the resistance of cables for fire conditions** - this is a comprehensive solution given by all the materials used in the cable, as well as in inserted layers, for example mica tapes screening the cable core itself from the devastating effects of fire.

The protections themselves are then provided with a plastic sheath, the task of which is primarily anti-corrosion protection.

A very special category in terms of the complex design of cables, including the appropriate protections, consists of flexible cables used, for example, to control drives in industrial robots. All layers of cables, including protections, must be combined to withstand millions of bending cycles.

The machinery for applying cable protections is basically of two types. Machines for braiding tapes or wires are separate lines or as part of stranding machine. The reason is the need to adjust the tapes or wires within the standard length of the cable and thus the possibility of stopping the machine at any point. In the case of longitudinally laid (or corrugated) tapes, the machines are part of the lines producing the cable sheath.



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Construction Products Regulation

The performance called "Reaction to fire" was defined for cables without cable routing and is regulated by European standard EN 50575; it describes the specific characteristics of cables that are classified during a fire, defines the range of classification, refers to testing methods and imposes obligations on manufacturers to issue necessary documentation and labeling of the product. Standard EN 50 575 instructs manufacturers to test each cable without the cable routing functionality, and to place all these cables into one of the seven classes, i.e. A_{CA}, B1_{CA}, B2_{CA}, C_{CA}, D_{CA}, E_{CA} or F_{CA}, whereas Class A represents essentially non-flammable material, and Class F represents very flammable material. Index "CA" is just an abbreviation for "cable". Assignment to a particular class is determined by the heat of combustion, flame spread, the heat release and the fire development index. This main classification scale includes supplemental classification for the smoke-developed index, falling burning droplets and acidity. The supplemental classification is marked with English abbreviations for smoke, droplets and acidity, and is further defined by the following scale:

- Smoke s1a, s1b - s3
- Droplets d0 - d2
- Acidity a1 - a3

FRNC = HFFR = LSOH = LFHC
Flame Retardant Non Corrosive
Halogen Free Flame Retardant
Low Smoke Zero Halogen
Low Fire Hazard Cables

In the event of a fire, certain equipment necessary to protect people and buildings must be in working order. This equipment needs to be supplied with power at all times and the information pertaining to them be readily available. For this purpose, so-called FRNC cables were developed. Cables with their properties will not be disrupted or short-circuited even if they run directly in the path of a fire. They will retain their functionality and power supply, and the transmission of information will not be interrupted.

Installation of cables that provide the supply of electric energy, transmission of signals and data, is usually carried out within interiors using supporting systems. That means that it includes cable wiring including all the supporting elements such as trays, ladders, clips, holders, etc. Fire resistance and functionality of the cable system - of the whole installation - has to correspond with the relevant standards on the level of safety of persons endangered by fire, as well as technology and material. In buildings and operations with an increased danger of fire and a high concentration of people (hospitals, places of entertainment, shopping centres, airports, tunnels, subways, etc.) fire safety equipment will enable proper and safe evacuation of people, material and the following intervention of rescue services.

We test cable systems in accordance with the standard ČSN 73 0895 or DIN 4102-12 in testing chambers, where they are exposed to model fire scenarios. Based on test results, cable systems are labelled with the functionality class and the time of sustained functionality.

FRNC = HFFR = LSOH = LFHC



PRAKAB: 100 years of Prague Cable Company

Texts Lukáš Berný and team of authors (Ing. Tomáš Zieschang Ph.D.,
Mag. Alexander Tremmel, Ing. Miroslav Tesař, Ing. Lucie Hladká,
Ing. Mária Tér Hradecká, Mgr. Zuzana Korbelová,
Mária Machovičová)

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