



tenova[®]

COMPANY PROFILE

**INNOVATIVE SOLUTIONS
FOR METALS AND MINING**







WHO WE ARE

Tenova, a Techint Group company, is your worldwide partner for innovative, reliable and sustainable solutions in the metals and mining industries.

Building upon decades of experience, we work alongside our client-partners to design and develop innovative technologies and services that improve their business today and into the future. We develop solutions that help mining and metals companies reduce costs, save energy, limit environmental impact and improve working conditions for their employees.

We are a company with a strong industrial background, and sharing the long-standing principles of an industrial group, we can better understand the needs of our international partners. We are more than three thousand forward-thinkers, men and women who take a proactive approach to problem solving in every business area in which we operate, and are continuously seeking new, cost- and energy-efficient ways to resolve the problems our clients are facing.

Together, the people of Tenova share a strong sense of passion for what our company does. By channeling this passion through professional expertise, we are able to anticipate trends and transformations within the industry, helping our clients identify and take advantage of new opportunities the moment they present themselves. We have earned our position as one of the industry's most trusted leaders by relying on a distinctive business approach that supports every project we undertake. This approach can be summed up in four key pillars: Innovation, Reliability, Sustainability and Safety. We believe in on-the-job passion, and actively seek out professionals who truly love what we do. Their contributions to our business have helped make Tenova the industry-leading company it is today, and their passion is the driver behind our business approach.

Tenova. Innovative solutions for metals and mining.

OUR COMMITMENT

We create client partnerships. Around the world Tenova professionals – from engineers to metallurgists, from chemists to experienced managers – place their skills in the service of our clients. Our eye is always on the long term, with a view to building strong, long-lasting relationships that benefit both partners over time. Four core pillars have inspired our business approach since our establishment.

Reliability

Companies choose us because they are looking for a reliable partner; a company that can provide innovative solutions for metals and mining that will work well, and well into the future. Whether you are installing a roll grinder, retrofitting a steelmaking facility, or developing conveying systems, you will find our

PATENT FAMILIES UP TO 2017

METALS

206

We believe innovation must improve production quality for our clients no matter what area of business they work in, increasing profits and upgrading performance by providing new, more effective methods to get the job done. We develop solutions that consume less energy, produce less raw

284

MINING

78

material waste, reduce costs and pollution, and increase overall facility efficiency. We focus on increasing the level of automation and digitalization in our clients' facilities, leveraging "information age" technology to help our clients perform more effectively in the 21st century.

Innovation





Sustainability

Our approach to sustainability within the metals and mining industries can be summed up as “waste not, want not.” We sit with our clients, carefully analyzing their industrial processes in order to identify solutions that will reduce energy consumption. We focus on limiting raw material

waste and improving facility efficiency so that our clients can both reduce costs and limit environmental impact. Our aim is to always be our clients’ first choice by offering a portfolio of “green tech” solutions that reduce air and environmental impact while saving energy.

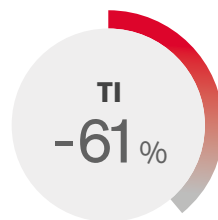
Safety

There can be no business success without on-the-job safety, so we ensure that every solution, every technology we design and implement makes the surrounding workplace safer. Whether we are designing automated process solutions to reduce the number of operators on the floor, incorporat-

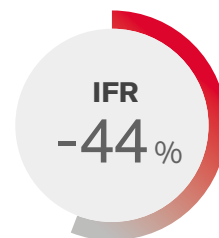
DECREASE IN TENOVA WORKPLACE INJURY RATES FROM 2013 TO 2017

FACTORIES 2013-17

Total Injuries

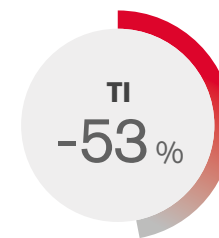


Injuries Frequency Rates

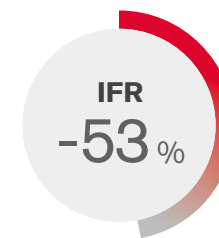


FIELDS 2014-17

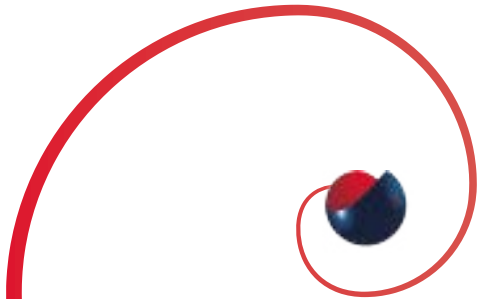
Total Injuries



Injuries Frequency Rates



ing avant-garde mechatronics, or designing control systems to identify and circumvent danger, we produce solutions our clients can rely on.



Our history is a tale of growth and success driven by our passion for technology, our commitment to serving our clients and a prudent eye for expansion opportunities in our reference markets. Key milestones include:



1945
Techint is founded to provide engineering services to steel industries in Italy and Latin America.



1988
Techint begins to expand, acquiring industry-leading roll grinder, rubber & plastic, long rolling mills manufacturer Pomini.



1997
Techint Technologies is established, reflecting our emphasis on identifying, developing and implementing technological solutions for our clients.



2000
Köster and EMCI technologies are acquired in order to enhance the group's offerings for electric furnaces.



2006
The group acquires LOI Thermprocess, an industrial furnace specialist, merging it with Italmimpianti. Pyromet, South Africa's foremost specialist in smelting furnaces and plants, and Key Solutions, a global leader in acid regeneration plants, join the group.

1954
The first steel tube production plants open in Argentina and Mexico, where they continue to operate successfully today.



1969
A flat steel cold-rolling facility was built in Ensenada, Argentina, which was meant to be the first step of a planned, fully integrated operation.



1994
Expansion continues with the acquisition of Intersteel Technology, with its leading-edge "Consteel®" technology.



1996
Techint acquires part of Italmimpianti and incorporates the subsidiary Tagliaferri, a well-known electric furnace company.



2005
Techint Technologies acquires the Goodfellow Efsop® process control system for EAF, and sets up HYL Technologies, a world leader in gas-based direct reduction plants.



OUR HISTORY



2007

Having accumulated decades of experience providing innovative solutions to the iron and steel industries, the company rebrands to reflect its new strong, independent market identity: Tenova is born. The company acquires TAKRAF, a global leader in open pit mining technology and material handling systems, expanding into the mining sector.



2008

Core Furnace Systems, a leader on the North American market for industrial furnaces and electric smelting/refining furnaces joins Tenova.



2010

Tenova acquires Tenova Re Energy in Germany, a company specializing in heat recovery and industrial furnace energy efficiency, and expands the mining business in China, establishing Tenova TAKRAF China.



2011

Tenova expands into three new markets, establishing Tenova Vietnam, Pomini Tenova Sweden and Tenova TAKRAF (Thailand). The group also acquires Nova Analytical Systems, a Canadian specialist in extractive-gas analyzers, and TAKRAF starts to develop crushers.



2013

Tenova acquires IVA, Schmetz, Mahler, BMI, and Huisen, leading suppliers for the aerospace, machine tool and automotive industries, as well as Technometal GmbH, specialized in secondary metallurgy. TAKRAF receives the first order for the innovative "Gearless Conveyors".



2016

Consolidating further, Tenova sells Bateman Projects, focusing on the equipment and technology sectors through TAKRAF and DELKOR, and acquires Material Handling Systems business unit from FMC Technologies, strengthening its position in this business area.



2009

Tenova's acquisition strategy continues with the entry of Multiform, Indian supplier specialized in cold rolling mills and strip processing lines, and I2S, an American company specialist in cold rolling mills.



2012

Tenova acquires Bateman Projects, Bateman Advanced Technologies (Israel), and the DELKOR Group, strengthening its presence in the mining industry.

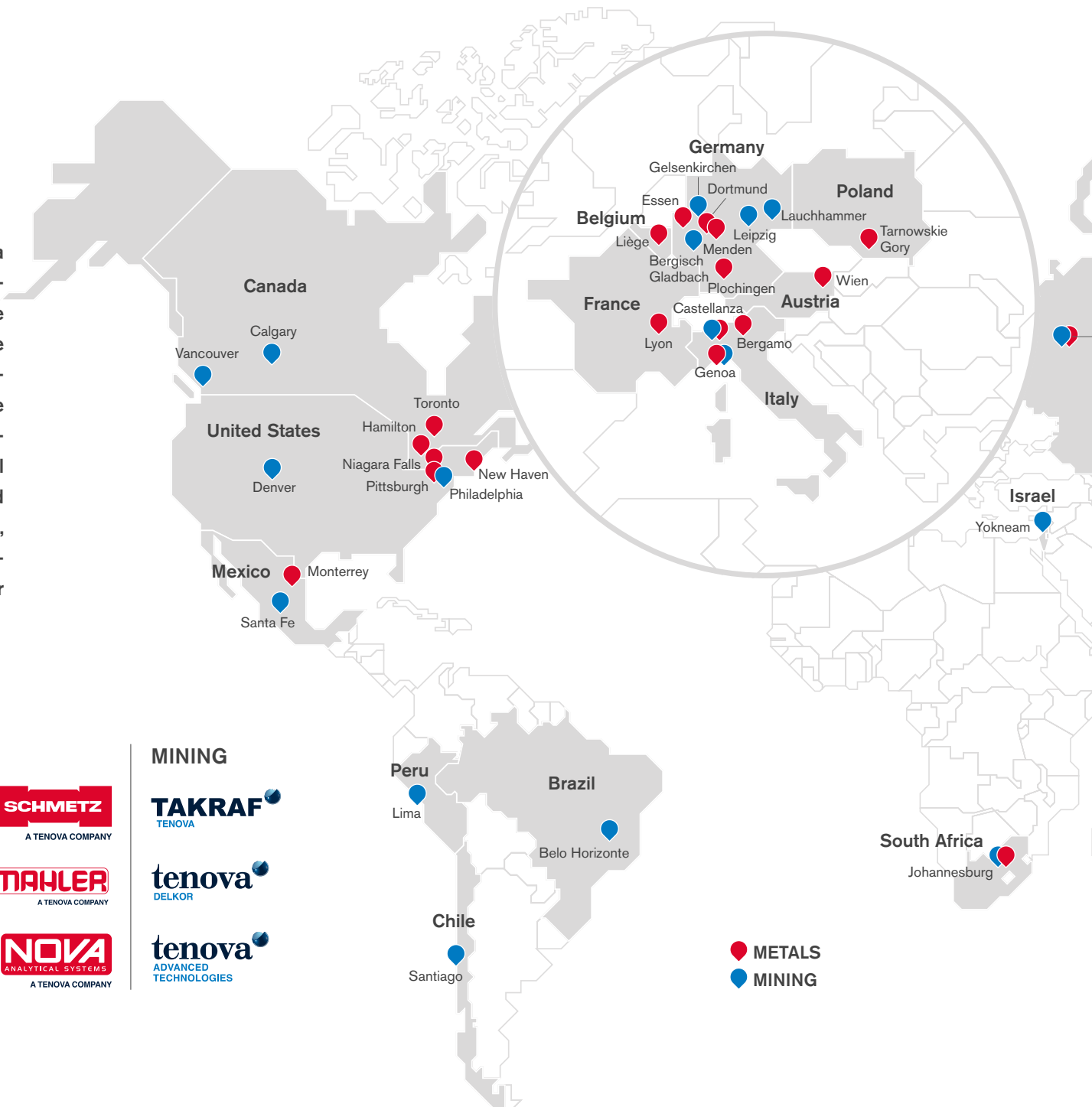


2014

Tenova focuses on consolidation, integrating and agglomerating various companies across the group. In the same year, TAKRAF starts developing HPGR technology (High Pressure Grinding Rolls).

OUR GLOBAL FOOTPRINT

Our corporate headquarters is in Castellanza (Italy), while Leipzig (Germany) is the primary technology hub for our mining solutions. We have steadily expanded our presence around the world, building a network of companies and services that can support our clients when, where and how they require. Today, we can boast local presence in 22 countries, including regional offices in China, India, South Africa, Latin and North America, and Australia. At a granular level, a network of local subsidiaries provides specific services and technologies across every major continent on the planet.



Brands

METALS

tenova

Pomini
TENOVA

tenova
HYL
A TENOVA COMPANY

SCHMETZ
A TENOVA COMPANY

tenova
LOI THERMPROCESS

tenova
ITALIMPIANTI

IVA
A TENOVA COMPANY

MAHLER
A TENOVA COMPANY

tenova
PYROMET

tenova
I2S

B.M.I.
A TENOVA COMPANY

NOVA
ANALYTICAL SYSTEMS
A TENOVA COMPANY

MINING

TAKRAF
TENOVA

tenova
DELKOR

tenova
ADVANCED TECHNOLOGIES

● METALS
● MINING

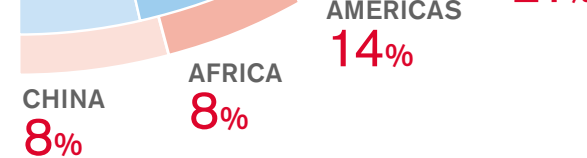
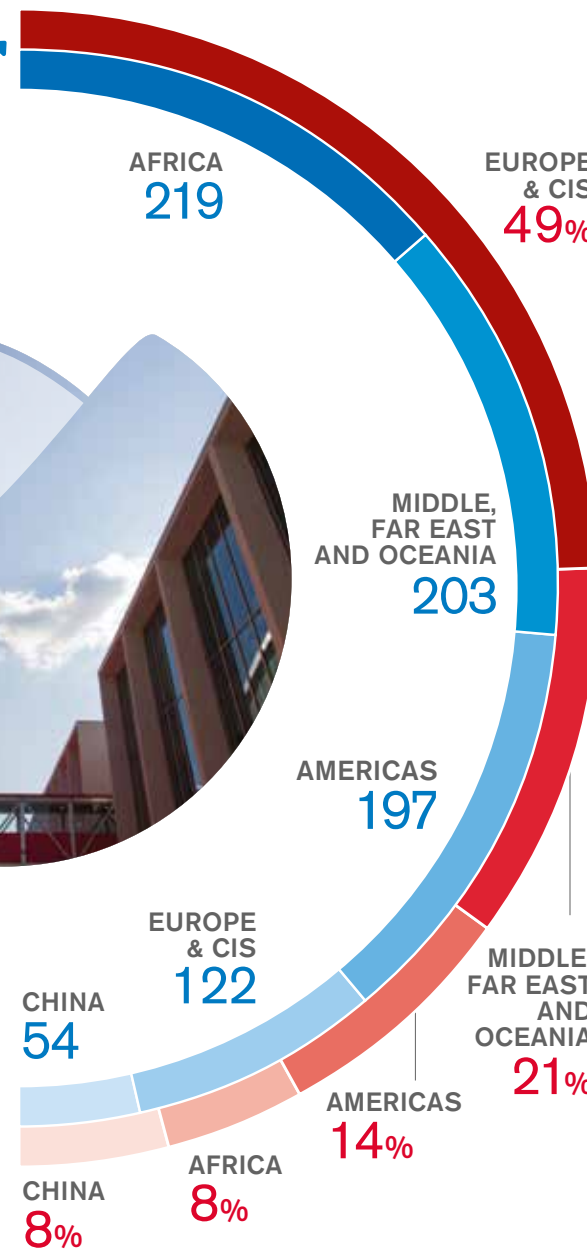


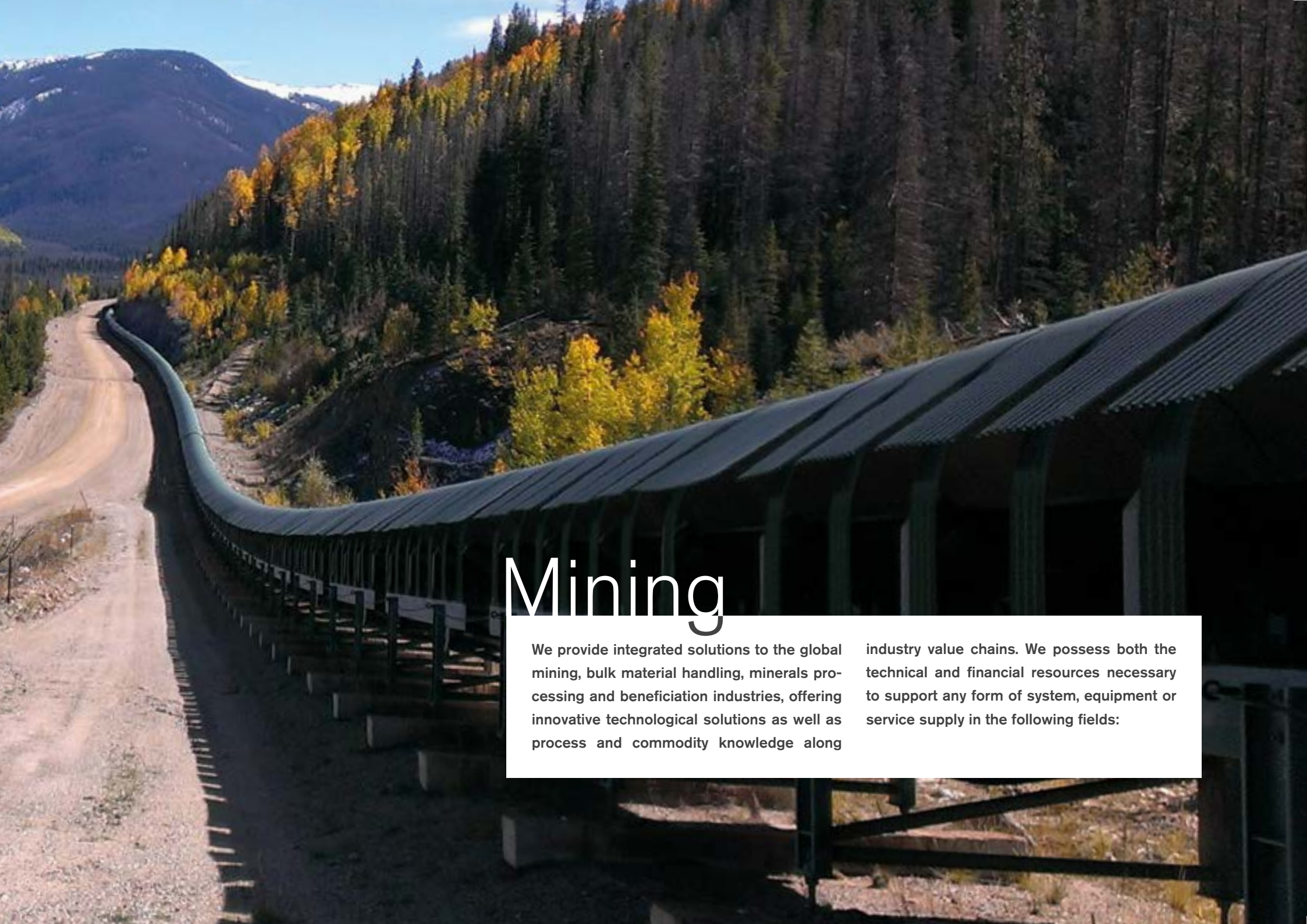
Backlog of Orders

920
MILLION
EURO

At December 31, 2017

Our company headquarters – the Tenova Campus – is located in Castellanza (Italy), and includes collaboration areas, a training center, sports facilities and green zones designed to leverage skill-sharing, knowledge and resources among all our employees.





Mining

We provide integrated solutions to the global mining, bulk material handling, minerals processing and beneficiation industries, offering innovative technological solutions as well as process and commodity knowledge along

industry value chains. We possess both the technical and financial resources necessary to support any form of system, equipment or service supply in the following fields:

OUR BUSINESS AREAS



MINING SYSTEMS & EQUIPMENT

Mining companies around the world rely on the quality, efficiency and reliability of Tenova TAKRAF systems and equipment for their excavating, crushing, conveying and dumping requirements; as well as the various auxiliary equipment we provide for all their operations.



BULK MATERIAL HANDLING

We are a leading provider of bulk material handling solutions across a broad variety of commodities in minerals, aggregates, fertilizers and grain. Our solutions also cover all forms of stockyard and/or disposal facilities (including dry stacking of tailings), loading and/or unloading equipment, all forms of conveying, various “in-plant” equipment and port facilities.



MINERALS PROCESSING EQUIPMENT

With the integration of established brands such as Tenova DELKOR (solid/liquid separation and wet processing specialists) and Tenova Advanced Technologies (hydrometallurgical process specialists) into TAKRAF as specialized product lines, our portfolio for the minerals processing and beneficiation sectors has been considerably enhanced.



AIR ENVIRONMENTAL & SPECIALIZED EQUIPMENT

As environmental and social issues become ever more important, our unique range of air environmental and specialized equipment allows us to best serve the needs of our clients and the communities in which they operate with sustainable and effective solutions. We are an acknowledged specialist in the

design and supply of such equipment and boast extensive references across all product categories, geographies and most industry sectors too.



SERVICES & COMPONENTS

We provide the full suite of services, ranging from project development & feasibility studies, engineering & design, fabrication & component supply, supervision & commissioning to spare parts & aftermarket support, inspection, maintenance & wear part management; as well as debottlenecking, refurbishments and relocation assistance.



Metals

Working both upstream and downstream, we strive to innovate continuously for our clients in the metals industries, focusing on quality, energy savings and reducing pollution. Our goal is to favor robust,

sustainable development. To accomplish this, we leverage a network of synergistic companies in order to provide our clients with the most advanced technologies, products and services in the following fields:

OUR BUSINESS AREAS



METAL MAKING

We provide solutions ranging from the production of Direct Reduced Iron (DRI) to advanced technologies for Electric Arc Furnaces (EAFs) and ladle furnaces, including technologies for nonferrous smelting, fume treatment and energy recovery solutions.



HOT FORMED

From heat treatment technologies to quench and temper lines, we supply a full range of hot rolling solutions, including reheating for long and flat products & forgings and heat treatment for pipes, plates and forgings using the latest combustion technologies and fully automated roll shops.



COLD ROLLING

Incorporating the most up-to-date technologies to process a broad range of materials, our rolling mills and roll shops, including top performing roll grinders, guarantee the highest standards in terms of material quality, thickness tolerance and flatness.



PROCESSING

Building upon our position as a world leader in High Performance Hydrogen bell-type annealing plants, we guarantee a broad range of state-of-the-art processing solutions. These include processing lines for carbon, stainless and silicon steel strips, heat treatment for wire, rods, tubes and bars, heat treatment for components, hot-dip galvanizing of components, specialty furnaces and roll shops.



ALUMINUM

From twin-chamber melting furnaces to advanced chemical technologies, we supply our clients with cutting-edge solutions for a range of aluminum needs, including aluminum heat treatment, aluminum smelting and recycling, aluminum strip processing lines and high quality roll grinders.



SERVICES & COMPONENTS

Leveraging the skills and capabilities of our expert staff, we custom-tailor a broad range of retrofits, modernizations, services and spare parts directly in-house for our clients, making sure mature equipment not only continues to function, but performs to the utmost of its capabilities into the future as well.



Our people are the single greatest factor in our success. The more than three thousand Tenova professionals working around the globe may come from different cultural backgrounds and have accumulated diverse work experiences, but they all share one decisive characteristic: a passion for technology united with skill at managing complex projects. They are men

and women dedicated to developing new, state-of-the-art solutions for our clients, pushing the envelope of what is possible and making Tenova an industry leader. Their passion is our promise: no matter what problems your company faces in mining or metals, our people will rise to the challenge with enthusiasm and a love for crafting superior technological solutions.



OUR PEOPLE



ANDREA LOVATO
CEO Tenova

In 2005 **Andrea Lovato** joined Tenova's parent company, Techint Group, as Head of Business Development and Mergers & Acquisitions. He moved to Tenova in 2012, expanding his role to oversee Human Resources and Information and Communications Technology, and was appointed CEO in 2015. Lovato's previous work experiences include management positions in the automotive industry and creation of a leading Marketing Services & Digital Solutions company.



ROBERTO PANCALDI
CEO Metals

In 1988 **Roberto Pancaldi** joined as Process Engineer the Techint Group, where he pursued his career in several units and companies. In 2005 he was President and CEO of Tenova HYL. In 2011, Pancaldi assumed the role of Tenova Senior Vice President and, since then, he occupied important positions in Tenova Metals. In 2016, he became Executive Vice President in charge of the downstream business. In January 2018, he was appointed CEO of Tenova Metals.



FRANK HUBRICH
CEO Mining

First joining TAKRAF in 1990 as a research engineer specializing in geological studies and mining processes, **Frank Hubrich** held a variety of engineering roles before being appointed CEO in 2012. At the same time, he was assigned to lead Tenova Mining, overseeing Tenova's global mining equipment activities. Hubrich is an internationally recognized expert in the mining and material handling sectors, and regularly publishes articles in various mining journals.



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TECHINT GROUP

