

# Rock Bolts

ARES

*Stability*

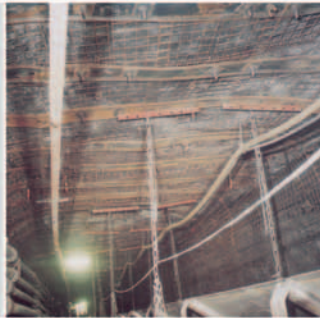


 **arcelor**

# Rock Bolts





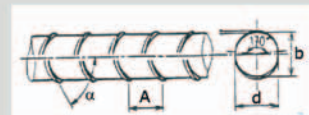


## Rock Bolts

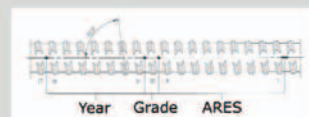
- ARES produces and develops Rock Bolts bars since 1982.
- Therefore has the ability to find the best solution to meet customer's requirements.
- Due to special mechanical characteristics (i.e. very high elongation, very high ductility) Rock Bolts are essentially used in mining applications.
- Other geotechnical applications for Rock Bolts are stabilization of soil masses under load, cavern/tunnel walls, excavations or slopes.
- Other advantages are high loads which can be carried with small borehole diameters and high shear bonding between deformed bar and cement grout.

Available as:

### A) Normal bar, indented or plain



### B) Threaded bar: bar with continuous, right hand, rolled on thread (\*)



- Full load carrying cross section, no damage to the bar surface in the threaded area.
- High dynamic load resistance due to the carefully designed thread profile.
- Free length-adjustment, easy bar-extension by coupling.
- Allows easy removal of temporary anchors as well as simple restressing and distressing.

**Diameter range:** 16", 18.5, 20, 21.7, 22", 25" mm (others on request)

**Bar length:** 6 - 24m

**Bundling:** 2.5t bundles wrapped with 5.5m wire

**Grade:** wide range of steel grade (450 up to 650 N/mm<sup>2</sup> yield strength and 650 up to 820 N/mm<sup>2</sup> tensile strength)

\*(with continuous, right hand, rolled on thread)

## ARES Brief History

Established in 1872 under the name of S.A. des Hauts Fourneaux de Rodange, the enterprise limited its activity to the production of pig iron until 1907 when a Thomas steel melting shop was installed, along with several rolling mills. Meanwhile, in 1905, the company had merged with S.A. Ougrée-Marihaye, a Belgian iron and steel producer of which the plant at Rodange became a division.

In 1935, the works again became autonomous with its incorporation as a distinct limited company under the denomination of S.A. Minière et Métallurgique de Rodange.

The installed section mill was completed by a 600mm mill train for special sections and a 300mm bar mill train to which was added, in 1950, a wire rolling train. During the 1950's, the Thomas melting shop was adapted to bottom-blowing with enriched air. An LDAC converter was installed in 1964. In 1971 the Thomas converters were adapted to blowing with pure oxygen by the OBM process.

The bar and wire mill was completely modernized in 1969, and in 1970 a new blooming mill came into operation.

In 1973 the company merged with the Athus division of Cockerill (Belgium) to form S.A. Métallurgique et Minière de Rodange-Athus. At the time, more than 5,400 people worked on the industrial site of Rodange-Athus. Industrial restructuring, enforced by the steel industry crisis which began in 1974, led to the complete shut-down of the Athus division, located in Belgium, and the cessation of hot metal production at the Rodange works in the Grand Duchy.

An agreement reached in 1977 with the Belgian and Luxembourg governments, as well as with ARBED, enabled the company to make a fresh start as a reroller, and thus to undertake, on an improved basis, the investments needed to guarantee high technical levels and improved productivity.

The section mill was modernized in stages: installation of a walking-beam reheating furnace, modernization of the layout of the mill train and of the rail finishing shop. A pilot installation for heat treatment of rails put into operation at the end of 1985 enables Rodange to maintain its position in the leading group of manufacturers of rails, a product which has always been the speciality of the company.

In 1994 the steel plant of Esch-Schiffange and the rolling mills of Rodange merged into one company ARES in which ProfilARBED participated with 76%. Esch-Schiffange is equipped with an electrical arc furnace which was installed in 1992.

With the merger in 2002 of Aceralia, Arbed and Usinor into ARCELOR, also ARES became part this new group. Arcelor was created through determination of these three European groups to mobilise their technical, industrial, and commercial synergies in a joint venture to create a global leader with the ambition of becoming a major player in the steel industry.

## ARCELOR

Arcelor was created in February 2002 by three steelmaking companies, Aceralia, Arbed and Usinor, with the intention of establishing a European company as the leader of the global steel industry. With a turnover of 32.6 billion euros in 2005, the company holds leading positions in its main markets: automotive, construction, household appliances and packaging as well as general industry.

The company - number one steel producer in Europe and Latin America - ambitions to further expand internationally in order to capture the growth potential of developing economies and offer technologically advanced steel solutions to its global customers.

Arcelor employs 96,000 associates in over 60 countries. The company places its commitment to sustainable development at the heart of its strategy and ambitions to be a benchmark for economic performance, labour relations and social responsibility.



## ARES

- Operational unit of ARCELOR Long Product Sector
- Is producing steel since 1872
- Operates in Luxembourg, one steel plant in Esch-Schifflange and two rolling mills in Rodange on which are produced reinforcement bars, crane rails and special sections
- The sales of those products are handled by ARCELOR REBAR COMMERCIAL (ARC) and ARCELOR RAILS PILES AND SPECIAL SECTIONS (ARPS)
- Was implicated in the development of the Tempcore process for rebars and the inline heat treatment of rails
- The last major revamping of the rebar mill was realized in 2005 and the revamping of the section mill is planned for 2006.

## Quality and Environment

- ARES is certified according to ISO 9001 (Quality Assurance) and 14001 standards (Environmental Management).
- Our Quality Assurance System is the guarantee for continuous high quality standards and products.
- Our environmental management standards exist to ensure that products and services have the lowest possible environmental impact.
- Quality Assurance System and Environment management structure are certified and regularly improved.

## Service

- Aim to offer innovative solutions improving security, cost, speed and flexibility
- On-time delivery
- Reliability on orders and rolling schedules, delivery dates
- Special lengths, special bundling, or dimensional tolerances on request
- Good commercial communication
- Quick and accurate document handling
- Quick claim treatment.

ARES provides through ARCELOR LOGISTICS various port services:

- Shipping to ports worldwide
- Shipping Container (Conventional, Multimodal)
- Administrative formalities
- Port handling
- Agency management.



## Rock Bolts

Diameter range	Yield strength $R_E$ (N/mm <sup>2</sup> )	Tensile strength $R_M$ (N/mm <sup>2</sup> )	Elongation after fracture $A_{5d}$	Charpy test DVM
Ø 16 mm*	450	700	min. 20 %	min. 30 J
Ø 18.5 mm	470	650	min. 20 %	
Ø 20 mm	450	650	min. 23 %	
Ø 21.7 mm	640	800	min. 17 %	
Ø 22 mm*	650	820	min. 17 %	min. 30 J
Ø 25 mm*	500	700	min. 20 %	min. 40 J
Ø 25 mm*	650	820	min. 17 %	min. 30 J

\*(with continuous, right hand, rolled on thread)