Steel fibres
Shotcrete applications
WireSolutions
Steel fibres solutions

WireSolutions is part of the ArcelorMittal Group, the number one steel company in the world. Major product lines of the unit are industrial wires (bright, galvanised, annealed, coppered...), agricultural products (fencing, barbed wire...), and steel fibres for concrete reinforcement.

ArcelorMittal has been producing steel fibres for over 30 years and is one of the leading suppliers of steel fibres worldwide. Through a local presence, ArcelorMittal aims to be closer to its customers to improve its service.

All the fibres manufactured by ArcelorMittal are made of cold drawn, high tensile steel wire produced using the most modern equipment. Our policy of continuous investment helps guarantee the durable performance of our products which are manufactured ISO 9001 and ISO 14001 standards compliant.

Transforming tomorrow.
ArcelorMittal has overcome challenges by optimizing the aspect ratio (fibre length over effective diameter) and by shaping their steel fibres in specific ways. These deformations can be along the fibre and/or at the extremities.

Aspect ratios between 40-80 are currently used. The higher the aspect ratio is, the more difficult will be the handling of a fibre. Steel fibres are available in various lengths from 20 mm up to 40 mm for shotcrete. 30 and 35 mm fibres have been applied most successfully. Specifying steel fibres by the dosage rate (kg per cubic meter of shotcrete) is common, but it is not in accordance with the latest findings, because of major differences in engineering properties and performance between the various types of fibres. Nevertheless a specification by performance is more and more common as it takes into account the specific characteristics of the different fibre types (rebound, anchorage, aspect ratio...).

Ongoing research at ArcelorMittal has resulted in the development of a variety of steel fibres for shotcrete, each performing best in its specific application.

All steel fibres from ArcelorMittal are cold drawn wire fibres and therefore type I fibres according to ASTM A820 and type 1 according to EN 14889-1.

### Steel fibres

Steel fibre reinforced concrete for shotcrete applications is now successfully used for many years due to its unique characteristics and its numerous advantages.

#### FE (Flat End)

FE (Flat End) fibres are straight fibres with flattened, enlarged ends for improved anchorage. FE fibres can be applied with minimum rebound loss. The typical tensile strength of the wire is 1 200 MPa.

#### HE (Hooked End)

HE (Hooked End) fibres are straight fibres with additional hooked ends. The HE shotcrete fibre can be used in all shotcrete applications. Commonly used with dosage of 25 to 50 kg/m³, depending on ground conditions. The HE fibre is shot with low rebound losses. The typical tensile strength of the wire is 1200 MPa.

#### TABIX

TABIX is an undulated steel fibre (1 100 MPa) used in slope and wall applications without overhead projection.

Fibre performance able to cover the full range of actual standard requirements (EFNARC, SIA, ASTM, all European standards).
Applications

- ArcelorMittal steel fibres have been used now for years successfully in many application areas.

01 Road tunnel
02 Railway tunnel
03 Water tunnel
04 Emergency gallery
05 Mining
06 Slope stabilization
Ground and rock support
Repair and refurbishment
Excavation and open pit stabilization
Special applications
Dosing equipment

Easy charging of a dosing unit

1) Transportation of the big bag by a wheel loader or forklift truck over the dosing unit.
2) Big bag bottom is cut and the fibres are dropping down.
3) Vibrating hopper for easy dosing of the fibres.

- Giving advice for the integration of the fibres.
- Available dosing units:
  - Automatic dosing unit with permanent control of fibre dosage rate.
  - Conveyor belts.
  - Bucket elevators.
  - Steel fibre blowers.
  - Storage and buffer belts.
- Assistance for planning and installation of dosing equipments.
- Possibility to control the dosing equipment by the batching plant IT system.
- Assistance and service on site.
- Easy installation and application:
  - All machinery is plug-and-play. So any installation can be done.
  - Within a short time and the production of SFRC can be started quickly.
Technical Support

With worldwide experience and site assistance, ArcelorMittal is your partner for the equipment selection and installation assistance, the chemical and additive recommendation, the right fibre selection for your application and for the mix-design for steel fibre reinforced shotcrete.

With ArcelorMittal fibres, you do not have just “pneumatically applied concrete”, but a steel fibre reinforced shotcrete of highest quality and reliability!

Advantages

Steel fibre reinforced concrete for shotcrete applications has now been successfully used for many years due to its unique characteristics and numerous advantages:

► Ductility of the reinforcement.
► Cost savings.
► Time savings.
► Material savings.
► Safe job site.
► Easy installation and application.

Outstanding technical support

► Providing top technical service to the customers from job start up until finalization of the project.
► Giving advice on mix design, fibres selection and dosing equipment in order to optimize performance and quality.
► Giving advice and training to the workers.
► Participating to testing and results analysis.
► In our opinion, research & development is the key to success. We allow our customers to take profit from our experience collected on job-sites around the world.