



**Reinforced
concrete
reinvented**

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DURUS® EasyShot 50

CONCRETE REINFORCEMENT

MAXIMIZING REINFORCEMENT PERFORMANCE
IN SPRAYED CONCRETE

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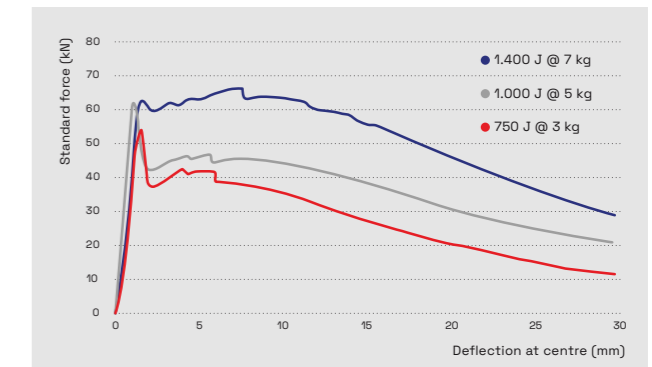
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DURUS® EasyShot 50

Durus EasyShot 50 is the latest addition to the Adfil range of high performance synthetic concrete reinforcement fibres. This product is specifically designed for the application in sprayed concrete. It is the result of more than two years of research and development work conducted at our state-of-the-art concrete laboratory. Durus EasyShot 50 has been tested at independent institutes.



Energy absorption according to EN 14488-5:2006



Geometry

The length and the diameter of Durus EasyShot 50 have been tailored to provide maximum pull-out force over growing cracks. This ensures optimum performance over the full concrete surface. Each fibre delivers durable reinforcement and energy absorption and facilitates the transfer of high loads even over large crack widths that can occur in shotcrete in tunnelling and mining applications.

Quality assurance

Durus EasyShot complies to EN 14889 - 2 : 2006 (EC Certificate of Conformity). The Quality Management Systems of Adfil facilities have been approved to the ISO 9001 Quality Management System Standard. Certificates are available on request. Adfil products are manufactured to exacting standards on technologically advanced production and packaging lines allowing constant monitoring of quality.



THREE-DIMENSIONAL REINFORCEMENT

Replacing steel mesh, Durus EasyShot 50 synthetic macro fibres improve the economics of every shotcrete project, providing reliable three-dimensional primary reinforcement. Typical end-uses include tunnelling and mining. Immediately after spraying, Durus EasyShot 50 significantly increases the ductility of the concrete while reducing shrinkage cracking. This creates a safe work environment while extending the service life of the finished concrete surface. The ductility of Durus EasyShot 50 reinforced concrete has been tested according to EN 14488-5 as well as its American equivalent ASTM C1550.

Outstanding workability

The tensile strength of Durus EasyShot 50 is up to 30% higher than that of conventional fibres. The product incorporates the embossed elongated design, which make Durus macro fibres unique in the industry. Moreover, both the polymer architecture and fibre length of Durus EasyShot 50 have been tailored for use in sprayed concrete. The product is easily mixed into the shotcrete mix leading to a homogeneous distribution which ensures a consistently high performance in every part of the structure.

ADVANTAGES & BENEFITS

- Easy to handle and to apply
- Reduced rebound during spraying
- Improved construction site safety
- Enhanced long-term properties of the finished concrete
- Low cost per Joule energy absorption
- 100% rust-free, hence no crack width limitation for durability as with steel
- Significant reduction in embodied CO₂ when compared with steel
- Less wear and tear on pumps and slick lines

GENERAL APPLICATIONS

- Tunnels (initial support in hard rock and soft ground, reinforcement of linings)
- Mines (initial support in hard rock and soft ground)
- Slopes (stabilisation)

All Durus macro synthetic fibres are chemically inert and have been subjected to the EN ISO 13438 aging test, which proved 100 years durability under normal conditions (see website for full report).

Performance testing

Durus EasyShot 50 is a result years of a bespoke product development culminating in a product performance that is unsurpassed by other products where testing has been done in back to back trials. The performance of EasyShot 50 has been ascertained in both cast panels which avoids the influences of the application of shotcrete during spraying, and also in sprayed panels which better represent the real life performance of the fibre. Independent sprayed shotcrete panels were needed in order to provide a complete overview of the performance of the fibre.

Outperforms steel

The Durus EasyShot 50 macro synthetic fibres are flexible, their length not limited by the opening size of the nozzle. This is a major advantage over steel fibres which are more rigid and need to be produced shorter so as not to block the nozzle during spraying. This fibre length therefore limits the performance of the steel fibres in the concrete.

Versuchsstollen Hagerbach (VSH)

The Hagerbach Test Gallery is a fascinating subterranean world. A multitude of galleries, caverns, testing areas, laboratories and training rooms provides the ideal conditions for research, development, testing and full scale experiments. Adfil therefore chose to have shotcrete testing performed with the latest equipment at VSH. Durus EasyShot 50 proved to be an exceptional fibre with state-of-the-art performance. The test results are available on request.

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