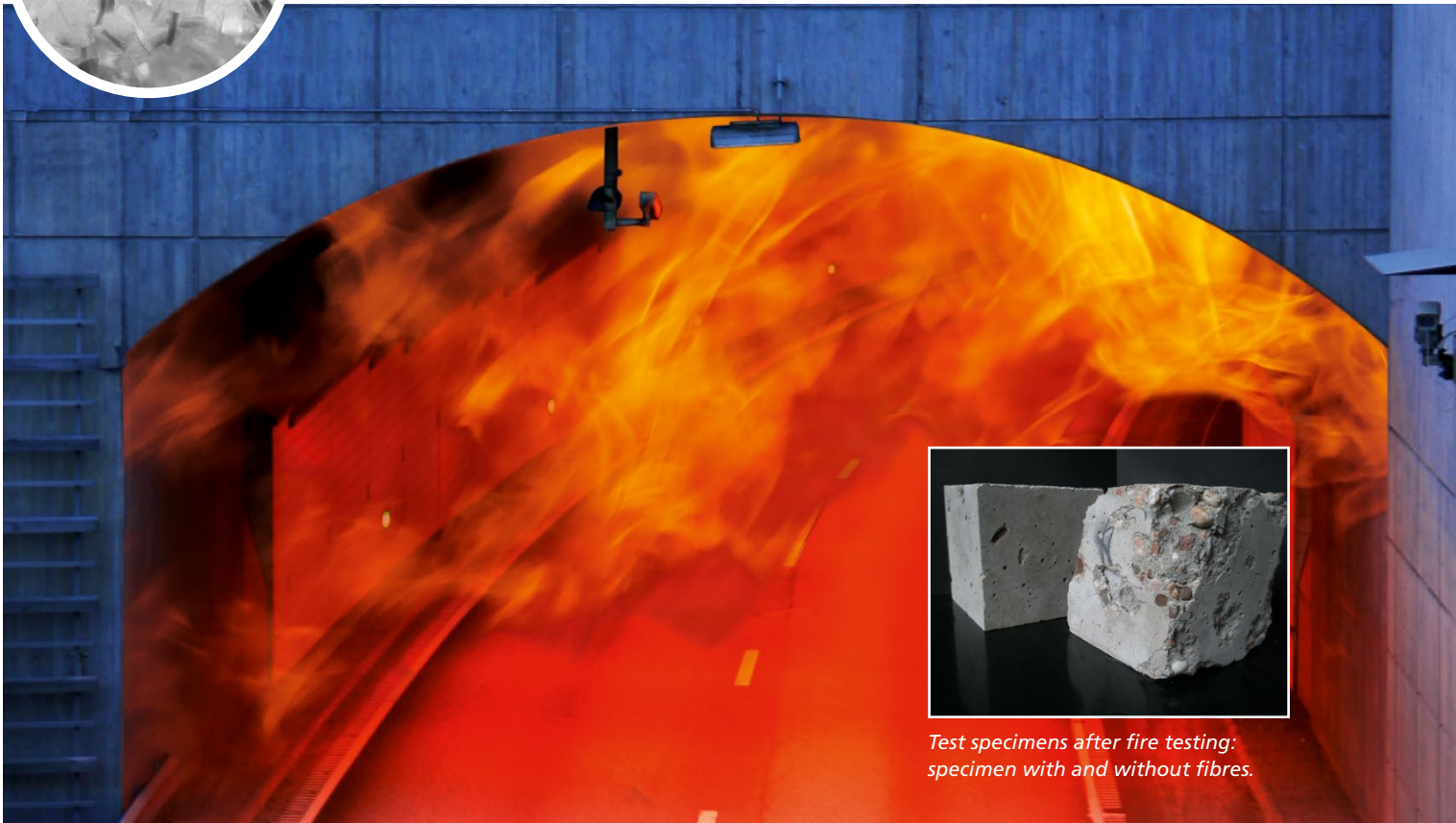




Functional Fibres for Fire-Resistant Concretes

For Improved Fire Resistance and Reduced Spalling



Test specimens after fire testing: specimen with and without fibres.



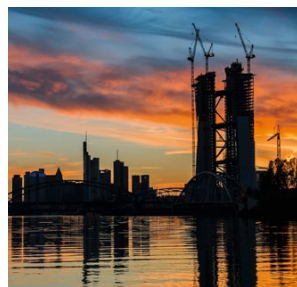
Tunnel Construction

- Precast tunnel lining rings (TBM process)
- In-situ concrete inner shell
- Top-down construction
- Shotcrete, jetcrete



Underground Structures

- Underground car parks
- Basements
- Underground railway stations



Building Construction

- High-rise building cores
- Storey ceilings
- Stairway / elevator escape paths
- Steel cladding
- Fire walls
- And fireproof mortar products

Since the 1980's the **PB EUROFIBER** brand has made a name for itself as a performance additive to improve construction materials.

Our functional fibres are used to optimise product and processing properties in a wide variety of technical products including concretes, cement-based mortars, adhesives and dry-mix compounds.

PB EUROFIBER has been successfully used to enhance the fire resistance of concretes and cement mortars since the 1990's.

Spalling Protection Fibres: How They Work

In the event of a fire, the PP-fibres embedded in the concrete melt, creating a permeable capillary network which permits escape of the gases evolved. Special PP grades with low melt viscosity rates provide enhanced fire resistance as shown by tests conducted with concretes of various types. The results:

- Reduced spalling
- Upgraded structural safety

Product Range (other products also available)

Standard Fibres

Product	Diameter μm	Fibre Length mm	dtex g/10.000 m	Fibre Count approx. $10^6/\text{kg}$	Theoretical Length approx. km/kg	Certifications
PB EUROFIBER REF 503 20/3	19.8	3.0	2.8	1200	3600	(1, 2)
PB EUROFIBER REF 506 20/6	19.8	6.0	2.8	600	3600	(1, 2)
PB EUROFIBER REF 506 18/6	18.0	6.0	2.3	725	4350	(2)
PB EUROFIBER PRO-MIX 32/6	31.7	6.0	7.2	230	1400	(1, 2, 3)

High-Performance Fibres

Product	Diameter μm	Fibre Length mm	dtex g/10.000 m	Fibre Count approx. $10^6/\text{kg}$	Theoretical Length approx. km/kg	Certifications
PB EUROFIBER HPR 15/6	15.4	6.0	1.7	1000	5900	(1, 2)
PB EUROFIBER HPR 20/6	19.8	6.0	2.8	600	3600	(1, 2)
PB EUROFIBER HPR 32/6	31.7	6.0	7.2	230	1400	(1, 2)

HPR (Heat Prompt Reaction) / High-Performance PP Fibres / Patented Technology

What sets **PB EUROFIBER HPR** apart from conventional PP anti-spalling fibres is its outstanding flow capability in the molten state. In the event of fire, this ease of flow permits quick and efficient formation of a permeable capillary network which vents off vapour pressure from the concrete, therefore reducing more efficient spalling.

HPR-Fibres / Advantages over Conventional Spalling Protection Fibres:

- Approx. up to 40 - 50 % lower fibre dosage
- Lower fibre costs per m^3 concrete in most cases
- Ease of processing
- Reduced need for concrete additives such as flow agents, stabilizers, etc.
- Increased stability of the concrete
- Reduced impact on slump behaviour

Test specimens shown after the fire testing:



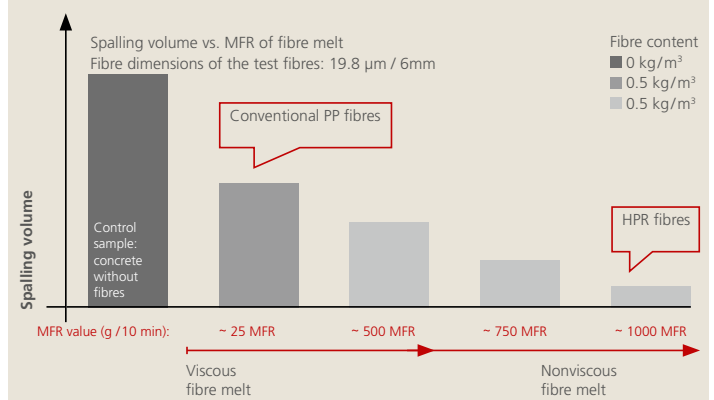
Specimen with no fibre additives



With 0.9 kg/m^3 PB EUROFIBER HPR

All information and data in this brochure are provided without engagement. We recommend evaluation of product suitability by appropriate testing before use.

Influence of Fibre Melt Viscosity (MFR value) on Spalling Rate



- Other fibre geometries available on request
Fibre diameter: 13 - $145 \mu\text{m}$ / Fibre length: 2.2, 3, 4.6, 6, 12, 18 mm
Fibre moisture content: approx. 0.5 - 3 % (product specific)
- Certifications/official approvals
(1) DIBt certification
(German Institute of Construction Technology)
(Certification no.: Z-3.73-1878)
(2) CE certified according to System 1 (with annual third-party monitoring)
(3) BB2G classification by ÖVBB Guidelines
- Packaging Options
Small packages: 50 - 5000 g / Large bags: 15 - 25 kg
Big Bags: approx. 200 - 500 kg