



# 406

**Betocrete** **406**

**RETHMEIER**

The New Type of Concrete Admixture

# Betocrete 406

## The new type of concrete admixture

### Effect

The protection of resources and environment leads to a worldwide interest in durability improvement of concrete constructions.

To realize these requirements concrete constructions should reach a service life of 100 to 200 years.

High performance concrete (HPC) is an essential material for such purposes.

Usual mix designs of HPC contain besides of Portland cement and aggregates puzzolanic admixtures like slag, fly ash or silica fume.

With the new product Betocrete 406 HPC can be batched by using a simple mix design only. Further admixtures are not necessary.

The effect of Betocrete 406 is synergetic.

A special mixture of super-plasticizers produces excellent fresh concrete properties at a low w/c-ratio favouring the strength development.

The puzzolanic mineral admixture promotes the formation of a cement stone with an extremely low content of capillary pores. Penetration of water and aggressive agents is reduced to a minimum.

### Strength development

A simple concrete mixture containing 300 kg CEM I 32,5 R, batched with 2% of Betocrete 406, reaches a compressive strength after 28 d twice as high as the control mixture.

The final strength will be in a range which can only be

### Mix Design

Mixture Proportions	CTRL B25	B25/2	CTRL B55	B55/2
<b>Binder Composition</b>				
CEM I 32,5 R (kg)	300	300	0	0
CEM I 52,5 R (kg)	0	0	450	450
Water (kg)	175	125	158	150
w/c-ratio	0,58	0,42	0,35	0,33
<b>Coarse Aggregate</b>				
2 - 8 mm (kg)	875	905	805	815
8 - 16 mm (kg)	675	705	448	458
<b>Fine Aggregate</b>				
0 - 2 mm (kg)	385	385	537	537
Betocrete 406 (kg)	0	6	0	9
<b>Fresh Concrete Properties</b>				
Slump, cm (DIN 1045)	43	42	42	41
Air content, %	1,8	1,5	1,2	0,8
Unit weight (kg/m <sup>3</sup> )	2410	2420	2398	2410

Betocrete 406 acts as a super-plasticizer and water reducer. The mineral component also acts as a stabilizer: a very good pumpable concrete can be produced without any separation.

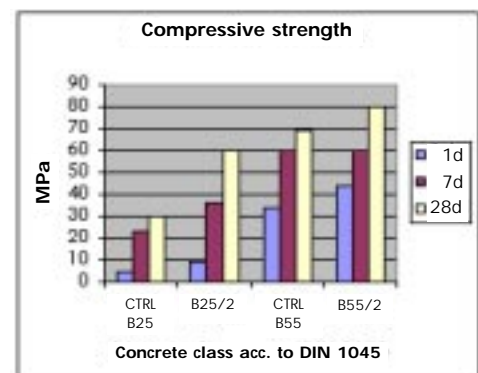


The best batching dosage amounts to 2 - 3% referring to the cement contents.



As the full effect will be reached after a short time of mixing the dosage to the batch can be done at last. In case of ready mixed concrete Betocrete 406 can be added on site.

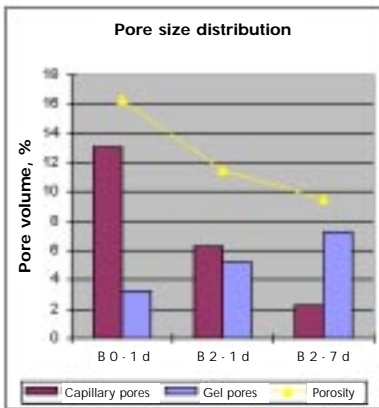
achieved with a high quality cement and a higher dosage of cement. Betocrete 406 enables to batch HPC without any additional puzzolanic additives and with a resource protecting use of cement.





### Microstructure and resistance against chemical attack

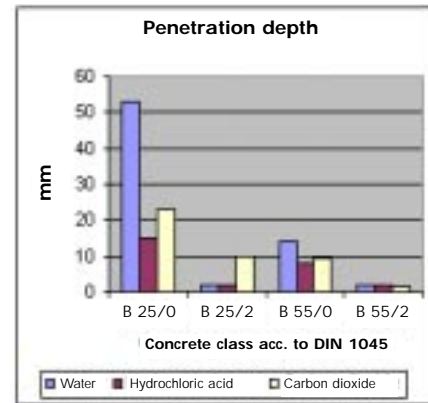
The change of the pore size distribution in the progress of hydration leads to an extremely compact microstructure of the cement stone. Capillary pores will be refined by the formation of solid calcium silicate hydrates or respectively closed.



The formation of these additional hydrate phases increases also the final strength and durability of the concrete.

All together the resistance of the concrete improved with Betocrete 406 is increased substantially. The penetration of water and hydrocarbons is reduced to a minimum.

Remarkable is also the high resistance against the chemical attack by carbon dioxide and diluted acids.



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### Benefits of Betocrete 406

- Increased strength
- Reduced water absorption
- Reduced chloride penetration and sulfate attack
- Acid and carbon dioxide resistance
- Pore refinement
- Efflorescence control
- Increased freeze-thaw resistance

### Fields of application

- Bridges
- Road blocks
- Tunnels
- Pipes
- Environmental protection layers
- Offshore structures

RETHMEIER

The SCHOMBURG group of companies including TEUTOBURG and RETHMEIER, TEXTEC and INDUTEC, is an international market partner for high quality systems and materials for the building industry.

The SCHOMBURG specialities are:

- sealing of buildings
- repair and sanitation materials
- composite tile laying
- industrial floor coverings
- general flooring systems

TEUTOBURG, RETHMEIER, TEXTEC and INDUTEC offer the following products to the market:

- heat insulation products
- paints
- plasters for facades
- products for the cement processing industry
- industrial fabrics
- polyurethane systems

Specialists like the quality and economy of our products, as well as the technical service and competent information they get from our representatives.

Skilled staff members travel all over Germany to serve our customers. In most of the European countries we are present with distribution companies, oversea countries are canvassed by production joint ventures and cooperation companies.

The know-how of the group of companies is required and acknowledged throughout the world - and therefore it is the basis for worldwide technology transfer.



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