A low w/c ratio is the key to durable concrete

FORMTEX®
Controlled Permeability Formwork (CPF) liner

The water/cement ratio (w/c) in the concrete determines the strength, denseness and thereby the long-term durability of the concrete.

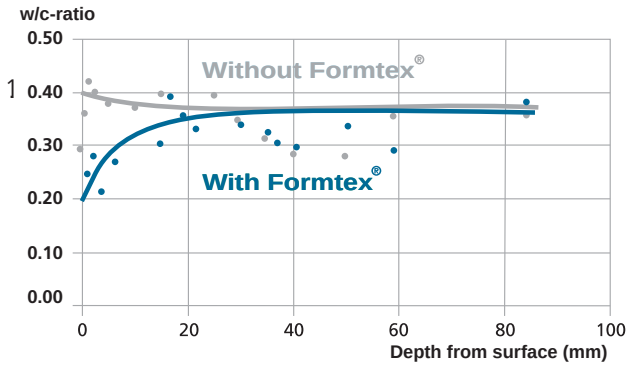
A reduction in the w/c ratio will create a more dense and resistant concrete surface, delaying penetration of for example minerals and salts, oxygen, moisture and carbon dioxide, thereby extending the service life of the concrete structure considerably.

If these aggressive elements penetrate the concrete cover, they will attack the reinforcement and damage the concrete structure.

Formtex®

When casting against Formtex®, excess water and air are drained from the surface of freshly cast concrete, reducing the w/c ratio in the concrete cover. See Figure 1.

Figure 1. W/C ratio, depth variation [1], [2]



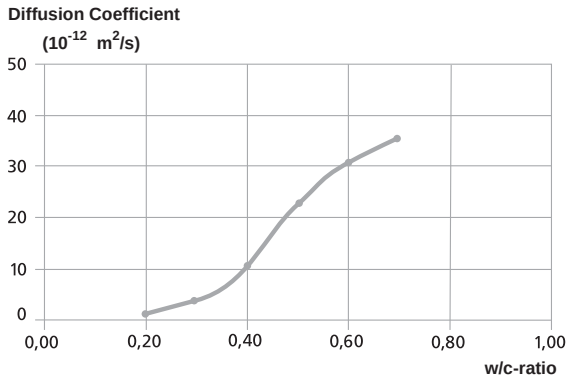
A w/c ratio of 0.20 at the concrete surface was obtained at Aalborg University, Denmark [1] when casting against Formtex® - a 50% reduction compared to casting without Formtex®.
An excellent result that can only be obtained by draining excess water from the concrete surface.

Chloride diffusion

The chloride diffusion coefficient is an expression of the speed at which chloride ions penetrate the concrete.

A test published in Cement & Concrete Research [3] shows that the chloride diffusion coefficient is dependent on the w/c ratio. See Figure 2.

Figure 2. Chloride diffusion coefficient in relation to the w/c ratio [3]



The chloride diffusion coefficient is reduced concurrently with the w/c ratio - the lower the w/c ratio, the stronger and more durable the concrete structure.

[1] Morten Gantriis Sørensen, Effekt af anvendelse af CPF ved betonstøbning (The effect of using CPF when casting concrete), Final thesis, Aalborg University, Denmark, January 2001
[2] Magazine of concrete research, vol. 43, num 155, June 1991, page 93-104
[3] Cement & Concrete Research, vol. 29 (1999) page 1497-1504

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