CAC for Building Chemistry

Application of CALUCEM – Calcium Aluminate Cements

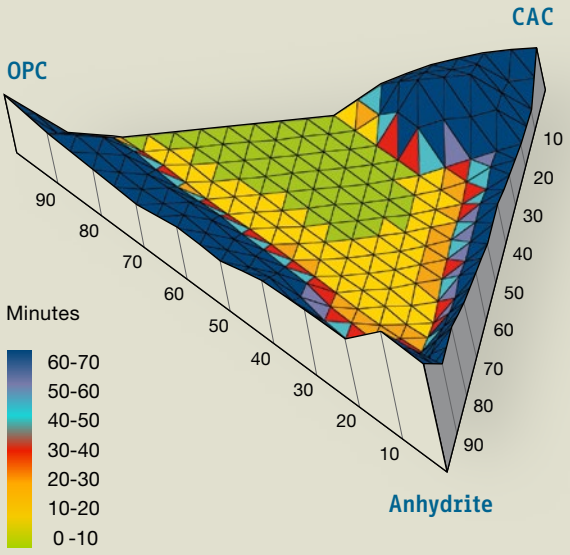
INTRODUCTION

ISTRA CAC are of interest to various applications in building chemistry due to their quick-setting properties and high strength. As an admixture to Portland cements, ISTRA CAC accelerate strength development. This is why they are used for the production of quick-setting and rapid hardening mortars. With further additives one can optimize particular desired properties, such as flow characteristics, water retention, adhesion or shrinkage.

In addition, ISTRA CAC bind more water than Portland cements as well as setting more rapidly. With ISTRA CAC you can take additional control of the hydration process and curing time. Floors which are constructed or repaired with mixtures containing ISTRA CAC can be placed in service after a very short time. ISTRA CAC are therefore an important raw material for the production of:

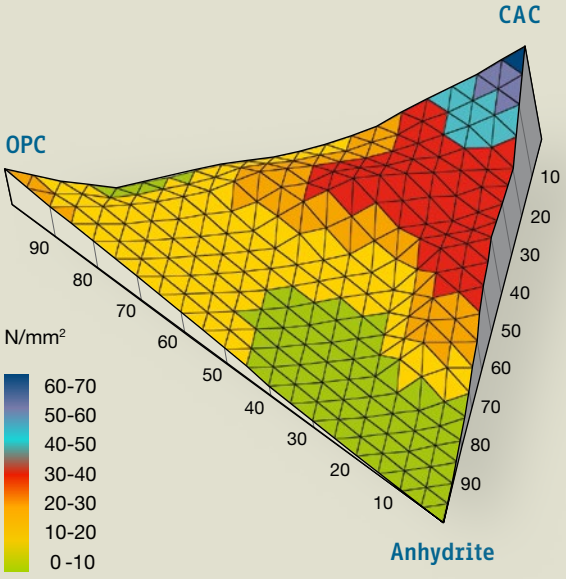
- **self leveling compounds**
- **tile adhesives**
- **tile grouts**
- **rapid floor screeds**
- **sealers**
- **bedding mortars**
- **repair mortars**

SETTING TIME OPC-CAC-ANHYDRITE



Advanced building chemistry formulations like tile grouts, tile adhesives or self levelers consist of the ternary binder system OPC - CAC - Anhydrite.

24 h COMPRESSIVE STRENGTH OPC-CAC-ANHYDRITE



The setting time and the compressive strength development of this system can be adjusted by choosing the right proportions of OPC - CAC and Anhydrite.

CALUCEM

APPLICATIONS

SURFACERS, FLOORING OR LEVELING COMPOUNDS AND RAPID SCREEDS

Surfacers and leveling compounds are used to correct uneven concrete or screed surfaces. The use of cements with high water retention is extremely important in the production of self-leveling compounds for floor surfaces. During the hardening process, ISTRA CAC absorb large amounts of the mixing water to form hydrates with a high crystalline water content. This combination with calcium sulphate (either anhydrite or calcium sulfate hemi-hydrate) can intensify and control this effect through the controlled production of Ettringite. The addition of ISTRA CAC results in low residual moisture after a short time. This means that the surface can be covered and opened to foot traffic soon after application. Other important properties like rheological behavior, adhesion or setting can be optimized by the addition of admixtures.

REPAIR OR RAPID MORTAR, ADHESIVE MORTAR, CASTING MORTAR

Building chemicals that are to be applied to repair or reinforce components have one thing in common — they have to set and harden rapidly, allowing the operator to continue his work efficiently. While the setting time of pure ISTRA CAC can be compared with that of pure Portland cement, mixtures of the two have setting times that are significantly shorter. This fact is based on the reaction of the main components of ISTRA CAC, the calcium aluminates, with the calcium sulphate and calcium hydroxide in Portland cement. Starting with 100% Portland cement (figure 1), the setting time is reduced proportionally as the content of ISTRA CAC increases. In this way the setting time of cement-based rapid or repair mortars can be varied over a wide range from hours to a few minutes by means of ISTRA CAC.

PROPERTIES OF ISTRA CAC

We offer four different kinds of ISTRA CAC for building chemistry use:

Application	CAC Type	Alumina cont. mass%	Color
all fields of BC products	ISTRA 40 (Lumnite MG)	40	dark brown
especially self leveling products	ISTRA 45 (Lumnite)	45	anthracitic
self leveling products, color sensitive	ISTRA 50 (Refcon MG)	50	beige
self leveling products, color sensitive	ISTRA 55 (Refcon)	55	light grey

Table 1: ISTRA CAC product range

ADJUSTMENT OF INITIAL SETTING TIME BY ADDING ISTRA CAC TO OPC MORTAR

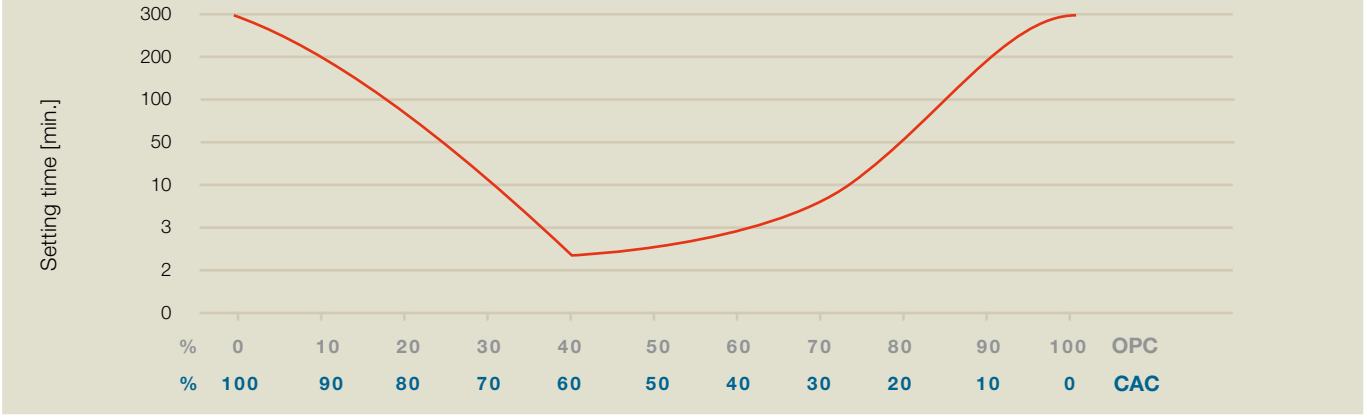


Figure 1

The excellent consistency of composition in ISTRA CAC is the key to the constant quality of the final products. The early strength values are increased if the setting time is reduced. The final strength values (28 days strength) of such cement mixtures, however, lie clearly below the final strength values of both primary cements (figure 2). Additives such as dispersion agents, methyl celluloses, etc. can influence important properties such as rheological behavior, adhesion and water retention.

COMPRESSIVE STRENGTH OF ISTRA CAC – OPC MORTARS

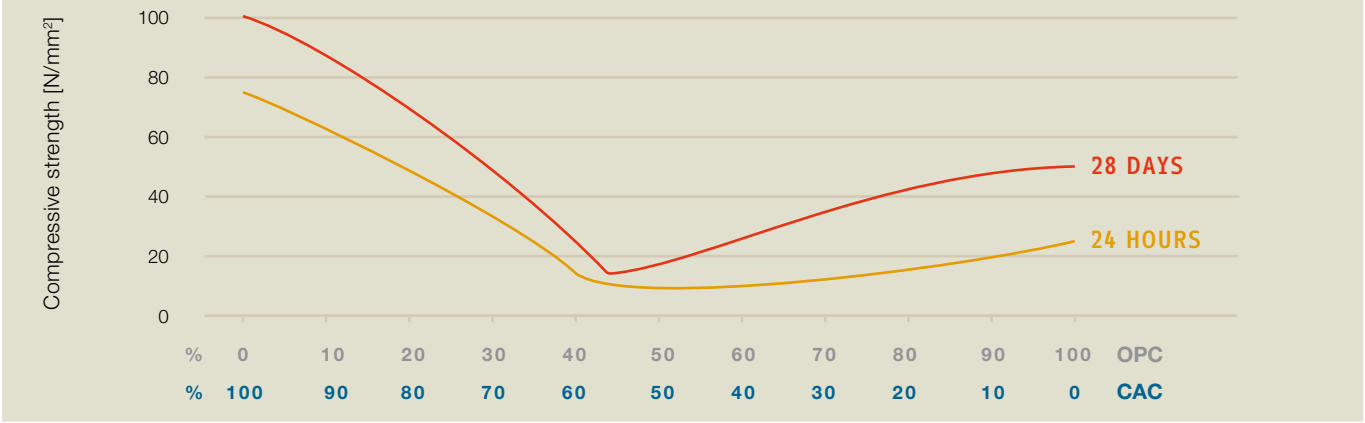
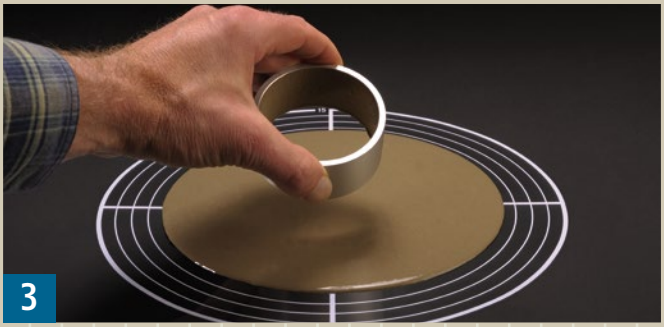
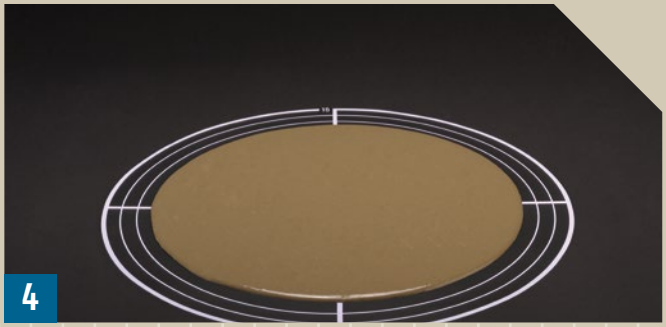


Figure 2





BENEFITS FOR BUILDING CHEMISTRY

- Quick Setting and Rapid Hardening
- Rapid Drying
- Size Variation Control
- High Mechanical Strength and Abrasion Resistance
- Corrosion Resistance

STARTING FORMULATIONS

Start formulations for building chemistry products are available upon request.

MORE INFO

For additional information about ISTRA CAC, please visit the CALUCEM web site at **www.calucem.com** or contact us worldwide.

www.calucem.com

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