

# SET ACCELERATOR

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## PRODUCT

TARGET® Set Accelerator is a chloride-free, dry powder accelerator designed for use with shotcrete. It is also suitable for use as a set accelerator in other Portland cement products such as concrete mixes and fence post mixes.

## USES

- A major use for this product is in accelerated shotcrete for mining, tunneling or rock stabilization operations where rapid set or high early strength are required for structural support.
- Accelerated shotcrete is also used for rapid sealing of water seepage through rock, earth or concrete.
- In situations where rapid installation of a reinforced shotcrete is needed, TARGET steel fiber reinforcement can be included in the mix to provide the required performance, as well as silica fume.
- Production of fast setting concrete using conventional portland cement, for example fence post mix.

## ADVANTAGES

- In addition to the advantages of rapid set and high early strength, TARGET Set Accelerator is less caustic and less hazardous to personnel than the Portland cement products to which it is added.
- The dry powder form of this product is ideal for dry-process shotcrete applications and provides added convenience for transportation, storage and application.
- TARGET Set Accelerator gives less reduction in ultimate strength than most other dry powder accelerators and performs more effectively than most accelerators at low temperatures.

## PROCEDURES

1. Determine the amount of TARGET Set Accelerator needed to give the required setting time and rate of strength development for the planned application. The temperature during mixing and curing must be considered during the testing because, like most chemical reactions, the degree of acceleration is reduced as the temperature is lowered.
  - In general, the addition of 1% to 5% of TARGET Set Accelerator by weight of cement will provide satisfactory results. The most common addition rate is 3% to 4%. Higher addition rates can be used for applications such as water sealing where very rapid setting is essential, and a slight reduction of the final strength is acceptable.
2. For dry-mix bagged shotcrete applications, it is preferable to premix the shotcrete and the accelerator before adding water. The premixing can be done during batching of the shotcrete, or an additive dispenser can be included in the application equipment.
  - In some cases, on-site additions of set accelerator are undesirable because of conditions such as the lack of suitable dispensing equipment or the absence of adequate quality control. The use of a dry-bagged, premixed, accelerated shotcrete is ideal in such situations. Target Products Ltd manufactures and supplies a wide range of dry-bagged, premixed standard and accelerated shotcretes, with or without silica fume or steel fiber reinforcement. The premixed product is supplied in standard

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paper bags, or in bulk sacks of up to 1,678 kg (3,700 lb) capacity.

- For site-batched applications when using damp sand the accelerator must be added to the mixture immediately prior to discharge into the shotcrete gun. Dispensing equipment is available for these applications.

## CAUTION

- Before using TARGET Set Accelerator in a Portland cement mix, check that the accelerator is compatible with the cement using ASTM C1117 and/or C1140. Some Portland cements with low C<sub>3</sub>A contents do not respond as readily to additions of this accelerator.
- Test mixes should always be made to determine the amount of TARGET Set Accelerator required to give the specified setting time, or to determine the effect of the accelerator on the early and later age strength of the mix. As with all set accelerators, the use of a high level of accelerator to achieve very short setting times can reduce the final strength of the mix.

## TYPICAL PROPERTIES OF TARGET SET ACCELERATOR

When added to a standard shotcrete mix with aggregate gradation meeting the requirements of ACI 506 Table 2.2.1, Gradation No.2 shotcrete, TARGET Set Accelerator gives approximately the following properties:

<b>ACCELERATOR ADDED</b> , % by wt. of cement	0		3.5	
<b>SETTING TIME</b> at 21°C (70°F), ASTM C266				
Initial Set, minutes	185		3	
Final Set, minutes	220		10	
<b>SETTING TIME</b> at 2°C (35°F), ASTM C266				
Initial Set, minutes	>720		24	
Final Set, minutes	>720		33	
<b>COMPRESSIVE STRENGTH</b> of test panels when cured at approximately 16°C (60°F) for 8 hours, then cored and moist cured at 23°C (72°F) :	MPa	psi	MPa	psi
at 10 hours	*	*	14	2030
at 3 days	19	2760	21	3050
at 7 days	37	5365	28	4060
at 28 days	50	7250	39	5660

\*Insufficient strength for coring

**NOTE:** The typical results shown are for shotcrete made with Type 1 (Type 10) Portland cement with a C<sub>3</sub>A content of 8.2%. The properties obtained will vary for other cement compositions.

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## PACKAGING

TARGET Set Accelerator is packaged in 22.7 kg (50 lb) plastic pails or plastic bags, or 227 kg (500 lb) open head, plastic lined drums, or ~850 to 1000kg (1875 to 2200 lb) bulk sacks. Other packaging to suit the requirements of major projects is available on request.

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