



Multicrete Shotcrete Set Accelerator

Chloride Free Designed for use with Shotcrete

www.multicretesystems.com

Product

Multicrete Shotcrete 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 some other Portland cement products such as concrete 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, steel fibre reinforcement can be included in the mix to provide the required performance.

Advantages

- In addition to the advantages of rapid set and high early strength, Multicrete Shotcrete Set Accelerator has the advantage of being 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.

Procedures

- Determine the amount of Multicrete Shotcrete 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 Multicrete Shotcrete 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.

- For dry-mix bagged shotcrete applications, it is preferable to pre-mix the shotcrete and the accelerator before adding water. The pre-mixing 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. Multicrete manufactures and supplies a wide range of dry-bagged, premixed standard and accelerated shotcrete, with or without silica fume or steel fibre reinforcement. The premixed product is supplied in standard paper bags, or in bulk sacks of up to 1 cubic yard.

Typical Properties

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

ACCELERATOR ADDED, 5 BY WT. OF CEMENT 0 3.5

SETTING TIME @ 21°C (70°F), ASTM C266

Initial Set, Minutes	185	3
Final Set, minutes	2203	10

SETTING TIME @ 2°C (35°F), ASTM C266

Initial Set, Minutes	>720	24
Final Set, minutes	>720	33

	Mpa	psi	Mpa	psi
At 10 hrs	*	*	14	2030
At 3 days	19	2760	21	3050
At 7 days	30	4350	28	4060
At 28 days	41	5950	39	5660

*Insufficient strength for coring

COMPRESSIVE STRENGTH of panels when cured at approximately 16°C (60°F) for 8 hours, than core and most cured at 23°C (72°F).

NOTE: The typical results shown are for shotcrete made with Type 10 Portland cement with C3A content of 8.2%. The properties obtained will vary for other cement compositions.

Caution:

Before using Multicrete Shotcrete Set Accelerator in Portland cement mix, check that the accelerator is compatible with the cement using ASTM C1117 and/or C1140. Some Portland cements with low C3A contents do not respond as readily to additions of this accelerator.

Test mixes should always be made to determine the amount of Multicrete Shotcrete 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.

Packaging

Multicrete Shotcrete Set Accelerator is packaged in 2000 lb. Bulk bags. Custom-size packaging available