

# TYTRO<sup>®</sup> AE 254

Air-entraining admixture for shotcrete

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## Product Description

TYTRO<sup>®</sup>AE 254 is an air-entraining admixture which generates a highly stable air-void system for increased protection against damage from freezing and thawing, severe weathering, or de-icer chemicals. TYTRO<sup>®</sup>AE 254 is specifically formulated for use as an air-entraining admixture for shotcrete and is manufactured under a high quality control process which provides consistent and predictable performance. TYTRO<sup>®</sup>AE 254 is supplied ready-to-use and does not require pre-mixing with water.

By agitation of concrete mixers, TYTRO<sup>®</sup>AE 254 disperses and generates millions of discrete semimicroscopic bubbles throughout the concrete composite. Once thoroughly mixed, the shotcrete contains a stable network of bubbles which act much like ball bearings increasing mobility, or plasticity, of the mix.

TYTRO<sup>®</sup>AE 254 complies with ASTM C1141 *Type II Grade 8 Standard Specification for Air-Entraining Admixtures for Shotcrete* and ASTM C260 *Standard Specifications for Air-Entraining Admixtures for Concrete*.

## Uses

TYTRO<sup>®</sup>AE 254 is used in all shotcrete applications to improve air entrainment stability and durability, and especially in the following applications:

- Temporary and permanent rock support in tunnels
- Underground rock support in mining
- Slope stabilization

TYTRO<sup>®</sup>AE 254 introduces high amounts of uniformly dispersed stable small air bubbles in all shotcrete applications, which are desired for providing high initial air content to achieve superior pumpability characteristics.

## Product Advantages

- Increased durability to all exposures
- Improved workability
- Reduced water content – with no loss of slump
- Improved pumpability through high initial air content
- Improved placement
- Bleeding and segregation minimized

## Addition Rates

The dosage of TYTRO<sup>®</sup>AE 254 can vary based on the mix design, type and content of cementitious materials, water-to-cementitious materials ratio, concrete temperature, ambient temperature and required air for exposure conditions.

Entrained air results in increased yields with a consequent decrease in the cementitious materials content of the placed shotcrete. This condition calls for a mix adjustment, usually accomplished by reducing the fine aggregate content. This is in addition to the reduction in water content brought about by the increase in plasticity.

The dosage of TYTRO<sup>®</sup>AE 254 normally ranges between 30 and 200 mL per 100 kg of cement. GCP Applied Technologies recommends that trials be performed with cement and aggregates under local conditions before use to assess and optimize dosage rates and performance.

## Mixing & Dispensing

In general, it is recommended that TYTRO<sup>®</sup>AE 254 be added to the mix near the beginning of the batch sequence for optimum performance.

It is recommended that TYTRO<sup>®</sup>AE 254 be introduced into the mixer by means of automatic dispensing equipment. A range of equipment is available, as well as advice on supply and fitting, from GCP Applied Technologies on request.

## Packaging

TYTRO<sup>®</sup>AE 254 is available in bulk, delivered by metered tank trucks, 1,000 liter totes, and 210 liter drums.

## Storage

### Temperature

TYTRO<sup>®</sup>AE 254 should be stored at a temperature range of 2 °C to 35 °C.

If TYTRO<sup>®</sup>AE 254 freezes, it will return to full effectiveness after thawing and thorough mechanical agitation. It is recommended that your local sales representative be consulted prior to the use of any products that may have been frozen. Performance tests should always be carried out prior to use.

### Conditions

TYTRO<sup>®</sup>AE 254 must be kept in closed plastic containers or closed tanks.

### Shelf life

If stored in tightly closed original containers and under the above mentioned conditions, TYTRO<sup>®</sup>AE 254 has a shelf life of at least 12 months.

Please contact your local GCP Applied Technologies sales representative regarding the suitability for use if the shelf life of TYTRO<sup>®</sup>AE 254 has been exceeded.

## Health and Safety

Avoid eye and skin contact and wear rubber gloves and safety glasses when handling this product. If contact occurs, rinse with plenty of water and seek medical advice.

For further information, refer to the SDS (Safety Data Sheet) or contact your local GCP Applied Technologies representative.

## Compatibility

TYTRO®AE 254 is compatible with all TYTRO®shotcrete admixtures.

Pretesting of the shotcrete mix should be performed before use and as conditions and materials change in order to ensure compatibility with other admixtures.

For use with other shotcrete admixtures systems, we recommend you contact GCP Applied Technologies for further advice.

## Properties

Form	Liquid
Color	Light Orange
Density: (g/cm <sup>3</sup> )	1.02 ± 0.02

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