

# DARAVAIR<sup>®</sup> M

Air-entraining admixture ASTM C260, AASHTO M 154

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## Product Description

DARAVAIR<sup>®</sup> M air-entraining admixture is an aqueous solution of completely neutralized vinsol resin. DARAVAIR<sup>®</sup> M is a clear, dark brown liquid intended for use as supplied. One gallon weighs approximately 8.9 lbs (1.07 kg/L).

## Product Advantages

- Readily entrains air under adverse air entrainment conditions
- Uniform air entrainment in paving applications

## Uses

DARAVAIR<sup>®</sup> M may be used wherever the purposeful entrainment of air is required by concrete specifications. It is particularly useful in mass concrete and in high cement factor, low slump paving mixes, which require efficient, effective air-entraining admixtures. DARAVAIR<sup>®</sup> M entrains air readily even under adverse conditions such as described above or when fly ash or manufactured sand is used in the concrete mix.

## Performance

Air is incorporated into the concrete by the mechanics of mixing, and stabilized into millions of discrete semi-microscopic bubbles in the presence of a specifically designed air-entraining admixture such as DARAVAIR<sup>®</sup> M.

These air bubbles act much like flexible ball bearings increasing the mobility, or plasticity and workability of the concrete. This permits a reduction in mixing water with no loss of slump. Placeability is improved. Bleeding, green shrinkage and segregation are minimized.

Through the purposeful entrainment of air, DARAVAIR<sup>®</sup> M markedly increases the durability of concrete to all exposures, particularly to freezing and thawing. It has also demonstrated a remarkable ability to impart resistance to the action of frost and de-icing salts as well as sulfate, sea and alkaline waters.

## Compatibility with Other Admixtures and Batch Sequencing

DARAVAIR<sup>®</sup> M is compatible with most GCP admixtures as long as they are added separately to the concrete mix. In general, it is recommended that DARAVAIR<sup>®</sup> M be added to the concrete mix near the beginning of the batch sequence for optimum performance, preferably by “dribbling” on the sand. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations. DARAVAIR<sup>®</sup> M should not be added directly to heated water.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. Please consult your GCP Applied Technologies representative for guidance.

## Packaging & Handling

DARAVAIR® M is available in bulk, delivered by metered tank trucks, totes and drums.

DARAVAIR® M will freeze at about 30 °F (-1 °C), but its air-entraining properties are completely restored by thawing and thorough agitation.

## Addition Rates

There is no standard addition rate for DARAVAIR® M. The amount to be used will depend upon the amount of air required for job conditions, usually in the range of 4% to 8%. Typical factors which might influence the amount of air-entraining admixture required are temperature, cement, sand gradation and the use of extra fine materials such as fly ash. Typical DARAVAIR® M addition rates range from 0.25 to 6.0 fl oz/100 lbs (16 to 400 mL/100 kg) of cement.

The air-entraining capacity of DARAVAIR® M is usually increased when other concrete admixtures are contained in the concrete, particularly water-reducing admixtures and water-reducing retarders. This may allow a reduction of up to  $\frac{2}{3}$  in the amount of DARAVAIR® M required.

## Concrete Mix Adjustment

Entrained air will increase the volume of the concrete and, consequently, it will be necessary to adjust the mix proportions to maintain the cement factor and yield. This is partly accomplished by the permissible reduction in water requirement and additionally by a reduction in the fine aggregate content.

## Dispensing Equipment

A complete line of accurate automatic dispensing equipment is available. These dispensers can be located to discharge into the water line, the mixer, or on the sand.

## Specifications

Concrete shall be air entrained concrete, containing 4% to 8% entrained air. The air contents in the concrete shall be determined by the pressure method (ASTM Designation C231), volumetric method (ASTM Designation C173) or gravimetric method (ASTM Designation C138). The air-entraining admixture shall be a completely neutralized vinsol resin solution, such as DARAVAIR® M, as manufactured by GCP Applied Technologies, or equal, and comply with standard specification for air-entraining admixtures (ASTM Designation C260). The air-entraining admixture shall be added at the concrete mixer or batching plant at approximately 0.25 to 6.0 fl oz/ 100 lbs (16 to 400 mL/100 kg) of cement, or in such quantities as to give the specified air contents.

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GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

In Canada, 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

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