

# RASIR®

To mitigate and control alkali-silica reactivity (ASR) in concrete

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## Product Description

RASIR® is a liquid admixture that can mitigate and control ASR in concrete when using potentially reactive aggregates or sand with high or moderate-alkali cement or where there are sources of external alkalis. RASIR® is a 30% lithium nitrate solution. RASIR® weighs approximately 10 lbs/gal (1.2 kg/L).

## Uses

- Where aggregates are susceptible to ASR
- With high/moderate alkali cement in geographic areas that could contribute to ASR
- Where there are external sources of alkali such as deicing salts, alkaline cleaners or marine environments
- Weather conditions (freezing and thawing/wetting and drying cycles)
- Traffic loading
- Critical structures
- Road, bridges, highways, parking garages
- Airport runways
- Water treatment facilities
- Dams, piers and docks
- Warehouses

## Addition Rates

The addition rate of RASIR® will depend on several factors including the alkali concentration of cement, cement content of the concrete, aggregate reactivity and the use of supplementary cementitious materials. ASTM tests should be performed in order to determine an accurate RASIR® addition rate when modifications to either of the above are made. Recommended tests are USACE CRD-C 662 and ASTM C1293 (modified for the testing of this admixture).

Inaccurate dosage rates of RASIR® are likely if these tests are not properly modified. Contact your GCP Applied Technologies representative for a copy of the recommended test methodology or for assistance in specifications.

Due to the wide variation of materials, admixtures and mix designs, we recommend that mix designs be appropriately tested prior to the project start.

An initial estimate of the required dosage rate of RASIR® may be obtained from the following equation:

RASIR® Dosage Equation =

$$(\alpha * \beta * \delta) / 100 \text{ in gal/yd}^3 \text{ or L/m}^3$$

$\alpha$  = Amount of cement to be mixed (lb/yd<sup>3</sup> or kg/m<sup>3</sup>)

$\beta$  = Alkali content of cement (%) from either the cement mill certificate or from testing (to be more accurate)

$\delta$  = For gal/yd<sup>3</sup> = 0.55 and for L/m<sup>3</sup> = 4.6

For example, for a mix containing 600 lbs. of cement with an alkali content of 0.60%, the standard dose is 2.0 gallons of RASIR® per cubic yard.

$$600 \times 0.60 \times 0.55 / 100 = 2.0 \text{ gal/yd}^3$$

To maintain the same water-to-cement ratio, subtract 0.84 gallons of water for each gallon of RASIR® added.

Due to the wide variety of admixtures and mix designs, pretesting of the concrete mix will provide the user with data on plastic and hardened concrete properties. RASIR® has no general or significant adverse effects on concrete properties; however, the addition of RASIR® to a concrete mix may accelerate the set time of the concrete. Therefore, testing the concrete mix design prior to production is recommended.

## Compatibility with Other Admixtures

RASIR® may be used with most GCP admixtures, as well as with fly ash or silica fume to help control ASR. The optimum level of pozzolans to help mitigate ASR should be determined by appropriate ASTM methods.

It is recommended that RASIR® be added separately to the concrete mix, usually through the water holding tank discharge line, and preferably at the end of the batch sequence. However, it may be added at other times in the batching sequence if testing shows acceptable performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations*, for further recommendations.

## Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available.

## Packaging

RASIR® is available in bulk, drums and totes.

## Storage and Handling

Temperature: RASIR® will freeze at 20 °F (-7 °C). Do not use pressurized air for agitation. Shelf life: minimum of 12 months, depending on storage conditions.

## Additional Information

Please contact your GCP Applied Technologies representative.

**gcpat.com | North America Customer Service: 1 877-4AD-MIX1 (1 877-423-6491)**

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