

## TECHNICAL DATA GUIDE- CONCRETE ADMIXTURE

### CAIR 104

#### Air Entrainer for Mortar and Concrete

##### DESCRIPTION

CAIR 104 is a chloride free air-entraining liquid admixture based on surface active surfactants which create spherical micro air bubbles of sizes ranging from 10µm to 400µm in the process of mixing mortar/concrete.

These ultra-stable bubbles entrain air in mortar/concrete; aids cohesion, reduces bleeding in fresh concrete mixes, improves compaction in low workability mixes and enhances the durability of hardened concrete exposed to freeze-thaw cycles.

CAIR 104 when added lowers surface tension of water, induces and retains air in concrete and mortar. The even distribution and uniform spacing of microscopic bubbles prevent the air voids for coalescing in fresh mixes. These air voids act like ball bearings, reducing friction allowing it to flow better during placement.

CAIR 104 confirms to performance requirements of BIS 9103 , ASTM C 260-81 & EN 934-2:T5

##### TYPICAL APPLICATIONS

- For light weight concrete
- For paving concrete with semi-dry mixes
- To enhance durability of concrete exposed to cyclic freezing and thawing.
- In combination with retarders for wet-mix plasters & renders.
- For pervious concrete and in gap-graded mixes to offer cohesive mix.
- To increase the efficiency of concrete pumps

##### FEATURES AND BENEFITS

- Stable air voids system in fresh and hardened concrete.
- Improves rheology, workability & finish ability.
- Increased resistance to ingress of water resulting in enhanced durability
- Helps control bleeding & segregation in concrete
- Increased pumpability for mixes with low binders
- Reduces acoustic and thermal conductivity

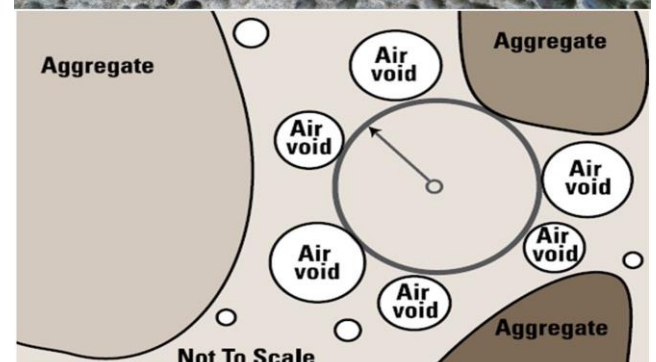
##### PERFORMANCE TEST DATA

Appearance	Pinkish Liquid
Relative density	1.01 ± 0.02 @25°C
pH	≥6
Chloride ion content	≤ 0.2%

##### MECHANISM OF ACTION

When CAIR 104 is added to cementitious materials, the hydrophilic and hydrophobic heads of the anionic surfactant create a strong interaction between air bubbles and negatively charged solid particles. The adsorption on the particles decreases its buoyancy and connects the air bubble to the particle network thus keeping the air bubble suspended in the aqueous phase and preventing the air bubble from splitting or coalescing.

The performance of anionic surfactants generally exhibits a linear correlation between surfactant concentration in the cement mortar and foam index





## DOSAGE AND DIRECTIONS FOR USE

Normal dosage rates of CAIR 104 varies between 0.05% - 0.8 % by weight of cementitious material. Addition of CAIR 104 to dry aggregate or cement is not recommended.

Optimum dosage of CAIR 104 should be determined by trials.

Exact dosage rate depends on

- The amount of air entrainment required,
- The quality & quantity of binders: lesser air entrainment with binders (OPC, PFA, GGBS etc.,) with increasing fineness.
- W/C ratio: Higher W/C entrains significant amounts of air in mixes
- Fine aggregates: Lesser air entrainment in sharp, angular, flaky as compared to round, cubical aggregates. Higher silt and clay contents also offer lesser air entrainment.
- Ambient temperature: Increase in temperature lead to decrease in air content
- Conveying, placement & consolidation techniques.
- Noticeable delayed retardation occurs when used in high dosage, when sulphate resisting cements/ supplementary cementitious materials are used and when ambient temperatures are low.

## LIMITATIONS

- Suitable corrections in dosage to overcome the air entrainment loss due to pumping.
- Air entrainment in mixes drop with time from the mixing and also decreases with increase in temperature of the mix
- For every 1 percentage of air entrained there may be a loss of compressive strength up to 5%.
- Increase in the fineness of cement & silt content reduces air entrainment.

## DISPENSING

The correct quantity of CAIR 104 should be measured by means of a recommended dispenser. CAIR 104 is supplied in liquid form. It should be added in supplied form mixed with batching water

## COMPATIBILITY

CAIR 104 is compatible to be used in combination with SNF & PCE admixtures, air entrainers, accelerators, curing compounds, retarders, corrosion inhibitors and shrinkage reducing admixtures, however it should be dispensed separately.

## PACKAGING

CAIR 104 is supplied in 20 & 210 Litre HDPE drums.

## STORAGE & SHELF LIFE

CAIR 104 should be stored in a shaded cool and dry place. Shelf life of CAIR 104 is 12 months from the date of manufacturing if kept in unopened, undamaged, original sealed packaging and kept within the range of 10°C to 50°C. If the product is frozen, thaw at +5°C or above and remix with mild agitation. Failure to comply with recommended storage may deteriorate the product or packing.

## HEALTH & SAFETY

CAIR 104 is water based, non-flammable and non-hazardous. However it should not be swallowed or allowed to come into contact with skin and eyes. Suitable protective gloves and goggles should be worn. Splashes on the skin should be removed with water. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. If swallowed, seek medical attention immediately - do not induce vomiting. For further information refer to the material safety data sheet

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ASIA PACIFIC - TDS REF No. V4 2021.

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