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MANUFACTURE OF EMULSIONS

Constituents

Bitumen

Bitumen is produced by oil refineries. An additive facilitating emulsification and improving the stability and adhesion qualities is sometimes included in the refining process before the product is delivered.

Fluxes

Most fluxes originate from petrochemical or carbochemical processes. More recently, fluxes originating from plant matter have been developed.

Trade organisations recommend banning the use of fluxes with R45 or R40 labels (confirmed or suspected to be carcinogenic).

Water

The water must contain minimum organic and mineral impurities. In general, to manufacture certain emulsions, it is necessary to "soften" the water using appropriate ion-exchange columns. The process consists in replacing the calcium and magnesium ions present in the water by adding sodium ions.

This is because calcium and magnesium ions, especially on $\text{NaCOO-C}_n\text{H}_m$ type emulsifiers, tend to react to form compounds that are insoluble in water that then no longer have emulsifying properties.

Emulsifiers

The emulsifiers most commonly used are chemical products described in the chapter entitled «General concepts».

Acid (case of cationic emulsions)

Since emulsifiers are insoluble in water, they must be converted into a salt to enable them to be dissolved in the dispersing phase.

To do so, they are made to react with an acid which in most cases is hydrochloric acid in an aqueous solution with a Baumé calibration of 20-22°. Orthophosphoric acid is also used for special applications.