

Hot Box Catalyst

Product Features

The hot box process for the production of foundry cores utilizes a hot box resin, either a liquid phenolic or a liquid furan resin, which is cured through the use of heat and a Hot Box Catalyst. These resins are mixed with sand and an appropriate catalyst, and then blown into a heated pattern to initiate the reaction. The hot box catalysts are referred to as latent acid catalysts. That is, these catalysts are not acidic in nature, but under the effect of heat they will decompose to produce a weak acid. This weak acid then, in conjunction with heat, initiates the curing reaction of the hot box resins, and allows for the production of strong cores using the hot box process.

Product Description

Hot box catalysts are water solutions of urea and ammonium salts of strong acid. They may also contain other materials, such as release agents or buffering agents, at low levels. A large variety of catalysts are available, varying primarily in the type of salt and the amount of salt present in the catalyst. The type of salt and the amount of salt used will affect the strength and speed of the catalyst.

Because hot box catalysts are a source of weak acid, anything that can neutralize this acid will adversely affect the performance of the hot box resins. Therefore a sand with higher Acid Demand Value, or a higher content of basic material, will require a stronger catalyst under the same process conditions. The particular catalyst to be used in a given situation will depend on:

- The type of sand
- The Acid Demand Value of the sand
- The core box temperature
- The core size and configuration

Typical Physical Properties

Product	17-515	89FR	81C	83H
pH	5.7-7.7	2.4-3.6	8.8-10.0	6.6-7.0
Density (lbs./gal.)	9.86	9.99	9.70	9.79

Performance Characteristics

Catalyst is added to the sand first typically at a level of 20% of the weight of resin, and mixed until effectively spread over all sand grains, typically 1-2 minutes. Resin is then added typically at a level of 1.5–2.0% of the weight of sand, and mixed another 2-3 minutes to effectively distribute the resin.

Core box temperatures of 400 - 500 °F are recommended. Cure times will be dependent on core size, configuration, sand type and ADV, and core box temperature, as well as the particular catalyst used. Typical cure times range from 10 seconds to 60 seconds or more. The type of sand used will influence the choice of catalyst. The HA International Technical Service Laboratory can help determine the specific catalyst that will give the best performance with a given sand and in a given situation.

Storage Guidelines

Recommended storage temperature is between 60 - 80°F. Catalysts do not age, but must be kept free from contamination and freezing. Therefore, when Hot Box Catalysts are stored under proper conditions and freezing has been avoided, the stock rotation period begins when the container is first opened (not the manufacturing date). From the date the drum is opened, you can usually expect to get a year or more of use from the material without any adverse performance effects. Drum storage should be in a dry area, out of direct sunlight. Partially used drums should be tightly closed to prevent contamination.

Safe Handling

Chemically resistant gloves and eye protection should be used when handling or using chemical binders. Material Safety Data Sheets are available for all products. Drum labels also contain handling information. This material will react with hot box resins in an exothermic reaction. Refer to the Material Safety Data Sheet for additional information.

Technical Service

Let HA International be “The Best Total Solution” for your foundry by providing innovative products, in-depth technical assistance, and a diverse product line specially formulated for any foundry application. Both our in-house and field experts are available to assist you with your most challenging foundry applications. Contact your sales representative for additional technical information.

For Emergency Medical Assistance Please Call:
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