



STYRENE

PRODUCT BULLETIN:

**FLEXICAT BLUE
Styrene Catalyst**

DESCRIPTION

CRI Catalyst Company ("CRI") Styrene Catalyst FLEXICAT BLUE is a non-chromium containing iron oxide catalyst used for the dehydrogenation of ethylbenzene to styrene. In both isothermal and adiabatic commercial operation, FLEXICAT BLUE offers the highest activity along with excellent styrene selectivity, low PA make, excellent mechanical strength and low decline rate. It can also be used in combination to FlexiCat Yellow or FlexiCat Red for specific performance requirements.

TYPICAL PROPERTIES

Chemical

Fe ₂ O ₃ , wt%	balance
K ₂ O, wt%	< 35%
Other Metal Oxides, wt%	< 40%

Physical

Pellet Shape	Cylinder
Pellet Size, diameter: mm (inches)	3.2 (1/8)
Apparent Bulk Density; kg/m ³ x 10 ³ (lb/ft ³)	1.41 (88) +- 5%
Crush Strength, kg/mm (lb/mm)	3.4 (7.4)

CATALYST STORAGE AND HANDLING

The CRI FLEXICAT BLUE catalyst is very durable and slowly absorbs moisture from the air. Prolonged exposure of the catalyst to high humidity can lead to a significant decline in catalyst strength. To guard against this, the catalyst is shipped in high strength bulk bags lined by moisture-tight plastic liners which are further protected by an external plastic cover. If storage is required, it is recommended that the bags be kept in a dry building.

Care should be taken to minimize catalyst handling since this can lead to the generation of catalyst fines. Although CRI's catalysts produce very little dust, operators should wear full face respirators and eye protection to protect them from catalyst dust while loading the reactors. If contact is made with the skin, wash with soap and water. The clothing used during catalyst loading should be laundered after use to prevent further skin contact with catalyst dust.

HEALTH, SAFETY, AND ENVIRONMENTAL PRECAUTIONS

To ensure safe use of its products, CRI has evaluated the hazards of CRI FLEXICAT BLUE according to the requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200. Full attention to these hazards and to appropriate health, safety, and precautionary information is essential. Before handling, testing or using this catalyst, a Material Safety Data Sheet must be obtained by contacting a CRI catalyst representative.

START-UP PROCEDURES

While CRI FLEXICAT BLUE catalyst can be operated at design feed and operating conditions within **4 days** of feed introduction, it is often more prudent to extend the start-up beyond 4 days for low S/O ratio operation, to ensure the longest possible catalyst life.

An individualized Start-up procedure will be provided by your CRI representative.

General Procedure: The nitrogen and steam systems should be thoroughly checked to ensure that there is no moisture. Heat-up with nitrogen rate should follow the licensor's recommendations. Steam introduction is initiated when all the catalyst bed temperatures exceed 260°C (500°F). Steam heat-up rates should follow licensor's recommendations. Ethylbenzene can be introduced when all the catalyst bed temperatures exceed 580°C (1076°F). The feed should be added as fast as possible to eliminate channeling and extremely high conversions. The steam/oil ratio (S/O) should be maintained at 12 molar (2.0 wt) until plant operation is stable and vent gas compressor has been started. The conversion should remain at or below 65% during the initial S/O reduction. The S/O ratio and thus feed rate should be adjusted slowly to design conditions over the next 4 days, or the time period agreed upon with your CRI representative.

CATALYST POISONS

Chlorides and sulphur are the primary poisons of styrene catalysts. A sulphur poisoned catalyst can be regenerated by operating the catalyst with sulphur-free feed. Poisoning by chlorides, however, leads to an irreversible movement of potassium promoter. In commercial practice, the concentrations of sulphur and chlorides in the reactor feed (combined fresh feed and recycle) should be kept below 20 and 1 ppm, respectively. Many additional chemicals are catalyst poisons at low levels.

See your CRI representative for a full list of known catalyst poisons.

PACKAGING AND AVAILABILITY

CRI's styrene catalysts are available in 1500 kg (3306.9 lb) bulk bags. Normally, the product is available for shipment 12 weeks from receipt of purchase order. Check with your CRI catalyst representative for specific product availability.

ADDITIONAL INFORMATION

All catalyst information supplied by CRI is considered accurate but is furnished with the express understanding that the customer receiving such information shall make its own assessments to determine suitability of such information for customer's particular purpose. All purchases of catalyst from CRI are subject to CRI's standard terms and conditions of sale (including CRI's product warranties) set forth in a sales proposal, sales contract, order acknowledgement, and/or bill of lading.

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