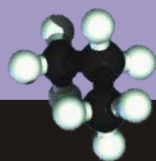
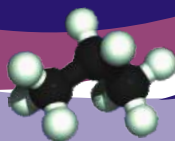
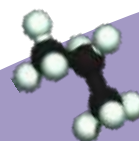




CATALYSTS FROM FILTRA



TECHNICAL BULLETIN

CHLORIDE GUARD CATALYSTS

ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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INTRODUCTION

This Product Bulletin covers the range of Chloride Removal Catalysts and the Operating Instructions have been prepared with specific care to serve as guidance for users of catalysts from **FILTRA CATALYSTS & CHEMICALS LTD. (FILTRA)**

While the Product Bulletin will serve the purpose of understanding various physico-chemical properties and the related kinetic data in regard to the catalyst, the Operating Instructions have been tailored to provide optimum plant performance. Even though great care has been taken in putting through as much data as is required, the information provided is general in nature and if a customer has any specific query regarding product data or operating guidance, **FILTRA** shall be glad to provide clarifications to such specific queries on written requests from users.

The procedure provided herein is not ultimate and supplementary instructions may be provided by **FILTRA**, if **FILTRA** so desires, depending on the need or if a customer requests for such a review for reasons beyond the purview of this Product Bulletin/Operating Instructions.

Also wherever any new data is generated by our Research wing, such data if beneficial, shall be made available to users of **FILTRA** catalysts.

FILTRA shall be pleased to answer any queries relating to its catalysts, such queries may please be addressed to:



PRODUCT DATA

I. ADSORPTION CHARACTERISTICS OF CHLORIDE REMOVAL CATALYST

Chloride Removal Catalysts are used for removal of chlorides from hydrocarbons or other off gases used as feedstock. Also any gas stream containing hydrogen chloride can be passed over this catalyst for removal of hydrogen chloride to undetectable levels.

One of the important application of Chloride Guard Catalyst in removal of chlorides from the stabilized hydrocarbon liquid and gas streams / hydrogen streams from the CCR Unit in refineries. There are problems of corrosion as well as green oil formation in the CCR downstream units. Filtra's Chloride Guard Catalysts are specially designed to tackle these problems.

The operating temperature in these processes, range from ambient to 220°C and FILTRA's Chloride Guard Catalysts are well suited for operation under these operating conditions.

FILTRA offers two grades of Chloride Guard Catalysts:

1. **FCR-71** is a modified Alumina based Chloride removal Catalyst and has been designed to have improved structure in the form of optimised porosity for enhanced kinetic adsorption. This product has improved chloride removal capacity, minimum polymer formation and longer run times between change outs.
2. **FCR-91** is an Alkali promoted Chloride Guard Catalyst with high chloride removal capacity (upto 22%). Due to its steep adsorption front, the chloride removal by this catalyst is well below 100 ppb level till the end of the life of catalyst. It is suitable for wide range of operating temperature from ambient to above 220°C.

The Catalyst is supplied in extrusion form as against spherical form and has lower attrition loss and higher crush strength. It also exhibits much lower pressure drop during the useful life of the catalyst.

FCR-91 is a chemisorption Catalyst and prevents any undesirable side reactions to form unsaturated organic chlorides.

FCR-91 prevents conversion to organic Polymer compounds and formation of Green Oil, which poses serious fouling problems in the downstream equipments.



II. START-UP/SHUT DOWN REQUIREMENTS

FCR-91 Catalyst does not require any pretreatment or activation before the start up. This Catalyst will require usual precautions of start up such as purging, gradual heating etc. followed for other adsorption Catalysts. Although FCR Catalysts particularly do not need any specific start up procedure, it is recommended that users' process manuals and safety manuals be referred



FCR-71 CHLORIDE GUARD

III A) TYPICAL PROPERTIES OF FCR-71 CATALYST

FUNCTION	: CHLORIDE REMOVAL CATALYST
APPLICATION	: Chloride or HCl removal
PHYSICAL PROPERTIES	
FORM	: EXTRUSIONS
SIZE	: 3mm dia. ± 0.2 mm (1:1 to 1:3 long)
CRUSH STRENGTH (kg) (Min. average side crush)	: > 7.0 kg.
SURFACE AREA (m²/g)	: 150-200
BULK DENSITY (kg/L)	: 0.80 ± 0.1
PORE VOLUME (cm³/g)	: 0.35 ± 0.05
CHEMICAL ANALYSIS	
Aluminium Oxide with modifiers	: Up to 95.00% (dry basis)
SO ₄ /Cl/NO _x	: < 0.01%
Other Metal Impurities	: < 0.01%
CATALYST LIFE	
Saturation Chloride pick up wt.%	: 12 - 15%

**Product specifications can be modified to meet customer requirements.



III B) TYPICAL PROPERTIES OF FCR-91 CATALYST**

PRODUCT NAME	: FCR-91
FUNCTION	: Chloride removal Catalyst, Gas phase & liquid phase
APPLICATION	: Chloride or HCl removal from hydrocarbon feed streams.
PHYSICAL PROPERTIES :	
FORM	: Extrusion
SIZE	: 3mm dia 0.2 mm (1:1 to 1:3 long) (or As desired)
CRUSH STRENGTH (kg) (Min. Average side crush)	: > 7.0 kg.
SURFACE AREA (m ² /g)	: 100 – 150
BULK DENSITY (kg/L)	: 0.9 ± 0.1
PORE VOLUME (cm ³ /g)	: 0.3 ± 0.05
CHEMICAL ANALYSIS :	
ALUMINIUM OXIDE	
PLUS PROMOTERS	: 92-95%(dry basis)
SO ₄ /Cl/NO _x	: < 0.01%
Other Metal Impurities	: < 0.01%
Catalyst life:	
Saturation Chloride pick up wt. %	: Min. 18%

**Product specifications can be modified to meet customer requirements.



IV. LOADING AND UNLOADING OPERATIONS

The catalyst is supplied in stabilised condition and can be sock loaded following standard procedure. Standard precautions of goggles, gloves and nose mask are sufficient for dust exposures during loading and unloading. Respirator and lifeline rope are necessary for any person entering the process vessel.

VI. STORAGE & HANDLING

FCCL's Catalyst is very durable. Store in Cool, Dry Conditions in covered godown in sealed condition. To guard this, the catalyst is Packaged in ployethlyene lined airtight MS Drums. During storage it is strongly recommended that the drums are on leveled ground & Stacking more than two Level should be avoided.

Catalyst handling should be minimal since this lead to generation of catalyst fines. Operator should wear full face respirator and high protection to protect them from catalyst dust while loading. If contact is made with the skin, wash with soap and water.

V. REGENERATION

Regeneration of Chloride Removal Catalyst is not recommended since this is chemisorption catalyst and converts to metal chlorides irreversibly. Therefore it is not possible to regenerate the catalyst.



FCR-91 Chloride Guard



LIABILITY

The Operating Instructions as put forth in technical bulletin has been prepared very carefully by experienced catalyst specialists. Further the data provided is based on available information from technical literature, laboratory experiments and in-plant commercial experience. While utmost care has been given in preparing this information, FILTRA does not possess complete data or intimate knowledge of the customer's plant or operations. Therefore, it may please be appreciated that while issuing these instructions FILTRA cannot assume any liability for upsets or damage to either the customer's plant or personnel. FILTRA earnestly request the customer to thoroughly review the instructions provided carefully and satisfy that the instructions provided herein will not pose any hazard to the specific operation for which the catalyst is intended for use.

FILTRA as a policy provides free after-sales technical service with experts who will be glad to provide any clarifications / assistance that may be required during loading / start-up / useful life of the catalyst; However, such FILTRA personnel who are present at the customer's site for such service, shall be present only in advisory capacity and cannot be charged with either knowledge or responsibility whatsoever for hazardous conditions, if any, that might result from the application of these instructions.

*Excellence
through
Research...*

FILTRA CATALYSTS & CHEMICALS LTD.

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