



SOXGETTER™ SO_x Emission Control Agent

DESCRIPTION

As concern grows over atmospheric pollution, government agencies world-wide have adopted legislation regulating the level of sulphur oxide (SO_x) emissions from oil refinery FCC units. While FCC feedstock desulfurization and flue gas scrubbing are both proven methods for SO_x emission control, many refiners find that the use of a SO_x reduction additive is the most cost-effective compliance strategy.

The SO_x reduction additive is added directly to the FCC catalyst inventory where it adsorbs sulphur oxides in the regenerator as sulphate salts and desorbs the sulphur as hydrogen sulphide in the riser. Hydrogen sulphide is processed in the refinery sulphur plant and is converted to elemental sulphur. The incremental hydrogen sulphide production is low and usually can be handled by existing sulphur recovery facilities.

INTERCAT's SOXGETTER is a SO_x control additive which has been developed to decrease the cost of removing SO_x from FCC flue gases. SOXGETTER emission control agent is based upon technology that employs hydrotalcite-like compounds as the active SO_x sorption component. Hydrotalcite [Mg₆Al₂(OH)₁₈·4.5H₂O] is a layered magnesium-aluminium crystalline structure that maximises the accessibility of highly reactive magnesium species to the flow of sulphur-containing regenerator gases. The high sorption capacity of hydrotalcite-like compounds allows the manufacture of products that clearly outperform products based upon existing technologies. Commercial testing of SOXGETTER has shown that it can reduce the cost of controlling SO_x emissions by 20-50% when compared with competing products. The superior performance and physical properties of SOXGETTER permit the refiner to meet regulatory limits while minimising operating expenses.

TYPICAL PROPERTIES

PACKAGING

Chemical Composition		55 gallon drums - 330 lbs / 150 kg each	
Hydrotalcite, wt %	82	Bulk bins or Big bags - 2,000 lbs / 1,000 kg	
Oxidants, wt %	14	Bulk Truck	
Impurities, wt%	0.6		
Moisture , wt % 110°C	4.0	Particle Size Distribution (732°C)	
Contained MgO, wt % oxide equiv.	39	0-20 microns, wt%	1
Attrition Resistance (ASTM D5757, 732°C)	1.2	0-40 microns, wt%	10
Surface Area, m ² /g (732°C)	115	Average Particle Size, microns	90
ABD, g/cc (732°C)	0.90		

The manufacture and use of SOXGETTER is covered under U.S. Patent Numbers 4,946,581, 4,952,382, 4,866,019 and other pending patents. This product is not recommended for use in regenerators that operate above 850°C

Version 4..11

INTERCAT

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COP™ -375,550, 850 Combustion Promoters for CO Oxidation

DESCRIPTION

A common problem in FCC units is afterburn resulting from the oxidation of CO to CO₂ in the dilute phase of the regenerator, or in the flue gas system, and is caused by poor air distribution or a mismatch of equipment/ operating conditions and/or feed type. Where it occurs, this afterburn causes high temperatures and possible mechanical damage.

A simple way to alleviate this problem is the use of a CO combustion promoter. Most combustion promoters contain platinum which catalyses the oxidation of CO to CO₂ in the catalyst bed where the heat of combustion can be absorbed by the bulk of catalyst rather than just flue gas. This means much lower temperature increases.

Most catalyst manufacturers produce an additive with the platinum supported on an FCC catalyst or catalyst matrix. Unfortunately this approach does not produce a product that optimises the CO oxidation potential of the platinum. INTERCAT has developed a manufacturing process that uniformly deposits the active metal throughout a specially engineered substrate. The result is a product that, based on active metal content, is the most efficient CO oxidation catalyst promoter available.

INTERCAT's COP products have the attrition resistance, bulk density, and particle size distribution of the circulating catalyst inventory which enhances retention of the additive in the FCC unit.

COP-375 contains less platinum group metal than either our COP-850 or COP-550 products. It has been developed to allow the refiner to economically optimize the number of catalytically active sites in the FCC unit regenerator.

COP-550 contains less platinum group metal than COP-850. It has been developed to allow the refiner to economically optimize the number of catalytically active sites in the FCC unit regenerator.

COP-850 contains the highest level of platinum available in the product family. It has been tested at major refiners and testing has demonstrated it to be the most efficient and cost effective CO promoter available. Keeping total promoter costs constant, changing from COP-850 to COP-550 will result in a 35% increase in catalytically active particles in the regenerator. This is particularly useful in units that have mild regeneration conditions, poor air distribution, or high stack losses.

TYPICAL PROPERTIES

Attrition Resistance (ASTM D5757)	0.9
Surface Area, m ² /g	105
ABD, g/cc	0.90
Na ₂ O, wt%	0.1
Particle Size Distribution	
0-20 microns, wt%	1
0-40 microns, wt%	6
Average Particle Size, microns	60

PACKAGING

Plastic pails containing 20 kg. each
2 and 5 lb. moisture proof bags
Other types of packaging are available upon request

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COP™ -375,550, 850

Combustion Promoters for
CO Oxidation

COMMERCIAL PERFORMANCE

Independent testing has shown that INTERCAT's COP™ products have the highest CO conversion efficiency on the market (see Figure below). In order to have a common basis for analysis, all promoters were diluted to 3 ppm wt Pt level by adding unpromoted, virgin Vision 529, catalyst that was shown to possess virtually no activity at the used reaction conditions.

