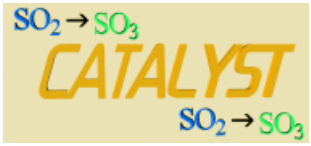
Sulphuric Acid Catalyst

Sulphuric acid catalyst, which is also named vanadium pentoxide catalyst, is a material to promote the oxidation of SO_2 and O_2 to give SO_3 for making sulphuric acid.
The high quality of sulphuric acid catalyst is based on the key attributes of activity, pressure drop, service life.



Based on more than 30 year's experience with sulfuric acid catalyst, our factory can manufacture several types of catalysts in different shapes and sizes, such as S101 series, S108 series, CHB75 series, CHB78 series. Our manufacturing technique is advanced, and the performance of our catalysts is excellent, with **high activity**, **low ignition temperature**, **high mechanical strength, low losses of screening, and long life.**
The different requirements in the various parts of the sulphuric acid converter typically dictate the use of several catalyst types. Our catalyst experts can assist you in specifying the proper catalyst type for your particular converter design.

Product Range

1. Broad Temperature Type of Sulfuric Acid Catalyst: S101.

Type S101
S101 Cylinder; S101-2H(Ring); S101-3MH(Star Ring). Type S101 Catalyst is a medium broad temperature vanadium pentoxide catalyst to promote the oxidation of SO_2 and O_2 to give SO_3, which is developed independently in China. This catalyst has a manufacturing history of over 40 years with high standard quality and steady performance, has reached international advanced levels. It has been widely accepted and appreciated by our users.
This catalyst has advantages of wide applicability, broad range of temperature, high conversion and high mechanical strength. Ring or star ring shaped catalysts have solved some problems with cylinder shaped catalyst, which are small pellets, high pressure drop and high energy consumption, bad resistance of dust accumulation.

2. Low Temperature Type Sulfuric Acid Catalyst: S108.

Type S108
S108 Cylinder; S108-H (Ring); S108-3MH (Star Ring);

Type S108 Series sulfuric acid catalysts have advantages of low ignition temperature, high conversion, and lowering environmental pollution. It has been widely accepted and appreciated by our users.

3. Higher activity leads to lower loading: CHB75

Type CHB75

Performance

Higher activity leads to lower loading.
The CHB75 series catalyst product can realize lower loading to reduce the pressure drop and energy cost by means of the superior surface area and activity derived from its unique formulation which differs from the traditional product. Especially, its long service life can also be helpful to obtain the longer duration and less interruption of production and to meet the criteria of pollutant discharge.

Specifically designed for the condition of upper beds
The CHB75 series, with its special design, is able to endure the tough bed condition of pass 1 and pass 2 in the converter. And, it is very resistant to particle pollutants so that less pressure drop can be available. Its unique micro-structure can also help to achieve a lower screening loss.

Properties

Type		CHB75-CH	CHB75-AH	CHB75-A
Appearance	Shape	5-Ribbed Ring	Ring	Cylindrical
	Diameter (I/O) (mm)	11.5/4.0	11.5/4.0	5.0
	Length (mm)	10～25	10～25	5～35
	Color	■Yellow → ■Deep or Pale Green		
Physical	Bulk Density (kg/L)	0.40～0.58		
	Particulate Strength (N/cm)	≥40		
	Ball Mill Hardness (%)	≤5		
Application	Sulfuric Acid Facilities, for different raw material and capacity design			
Packing	Fibre Drum or Metal Drum			
Storage & Transportation	Keep Dry, Rain Proof, Handle With Care, Do Not Roll			


4. High Performance Catalyst: CHB78

Type CHB78

Performance

High Performance Catalyst

Excellent activity can still be achieved by CHB78 under the condition of low temperatures, high SO2 and low O2 concentration. With its performance superior to most of the competitor catalysts, CHB78 is widely used in pass 2, 3, 4, and 5 of the converter. CHB78 can also improve conversion performance at low SO2 and O2 concentration after the first absorption.

Balanced Properties

CHB78, produced with its own particular formulation and process, offers superior activity for long duration operation and has both activity and hardness well balanced. Moreover, lower screening loss can also be achieved.

Properties

Type		CHB78-CH	CHB78-AH	CHB78-A
Appearance	Shape	5-Ribbed Ring	Ring	Cylindrical
	Diameter (I/O) (mm)	11.5/4.0	11.5/4.0	5.0
	Length (mm)	10～25	10～25	5～35
	Color	■Yellow → ■Deep or Pale Green		
Physical	Bulk Density (kg/L)	0.42～0.60		
	Particulate Strength (N/cm)	≥40		
	Ball Mill Hardness (%)	≤5		
Application	Sulfuric Acid Facilities, for different raw material and capacity design			
Packing	Fibre Drum or Metal Drum			
Storage & Transportation	Keep Dry, Rain Proof, Handle With Care, Do Not Roll			

Operation manual

1). Range of Application

1). Sulphur iron ore making sulphuric acid
2). Smelts smoke gas making sulphuric acid

3). Sulphur burnt making sulphuric acid.

2). Operating Requirements

1). Type S101 series of broad temperature catalysts suit for every bed of converter.
2). Type S108 series of low temperature catalysts suit for 1/3 top of the first bed to decrease inlet operating temperature, and 4^{th} bed, 5^{th} bed to improve equilibrium conversion and decrease gas emission.
3). Install the catalyst beginning at the far side of the converter working back towards the manway. Use the marks on the converter wall as a guide for leveling the catalyst. Avoid walking directly on the catalyst. Use plywood sheets or boards laid on top of the catalyst if access is required across the top of the bed.
4). New catalyst is easy to get damp, so it is better to choose fine days to sift it and load it .Time that catalyst is exposed in air should be as short as possible.
5). Catalysts used in low temperature beds can be moved to high temperature beds, but contrarily it can't be loaded. New catalysts should be loaded in the surface of each bed, and separated from used catalysts with stainless steel nets.
6). It should inspect the pressure drop of each bed before repairing, and inspect the activity of catalysts in each bed before loading, so that supply some information for screening, loading or removing.

3). Start-up and Shut down

1). Heating up: Before start-up, heating up with dry air. The rate of heating is 20-30℃/h, but for new catalysts, the rate of heating should be controlled in 10-15℃/h before it reaches 150℃. In the plants using diesel oil for heating, the discontinuous heating method is recommended when the temperature is under 150℃, and make sure it burnt thoroughly in order to prevent the surface of catalysts extracting carbon. While heating, please control the moisture from blower, which should be not higher than 0.1g/Nm^3.
2). Gas injected: When inlet temperature of 1st bed reaches above 400℃, and inlet temperature of end bed is above 250℃, then the gas can be injected. Initial volume of gas flow is 1/3-1/2 of the total, and the gas concentration below 5% is ok. Then, make sure the exit temperature of 1st bed is not higher than 650℃, and increase the gas concentration and gas flow properly.
3).Shut down: For a short-time shut down, it should increase the inlet temperature of 1^{st} bed (increasing 15℃), and close valve. However, for a heavy repair or long-time shut down, it should use dry air above 400℃ to replace the gas in the converter, till the content of SO_3 in emission gas is less than 0.03%.

4). Purifying index demanded of catalysts

Water, acid mist, mine dust and the arsenical of content will make catalyst curdled and poisoned, it will affect the system resistance and Conversion ratio. The following indexes should be well controlled.

Moisture ≤ 0.lg/Nm^3 F ≤ 0.00lg/Nm^3
Acid mist ≤ 0.03lg/Nm^3 As ≤ 0.00lg/Nm^3
Mine dust ≤ 0.005g/Nm^3

Specification of Type S108 Series and Type S101 Series

Item \ Type	S108	S108-1H	S108-3MH	S101	S101-2H	S101-3MH
Color	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Shape	Cylinder	Ring	Star ring	Cylinder	Ring	Star ring
Diameter(mm)	4.5-5.5	OD:9-11 ID:3-5	OD:10-12 ID:3-5	4.5-5.5	OD:9-11 ID:3-5	OD:10-12 ID:3-5
Bulk density (kg/l)	0.65-0.7	0.5-0.6	0.5-0.6	0.6-0.7	0.5-0.55	0.5-0.55
Activity (%)	≥35.0	≥42.0	≥42.0	≥81	≥86	≥86
Crushing strength (N/cm)	≥60	≥40	≥40	≥70	≥40	≥40
V2O5 Content（%）	≥6.2	≥6.2	≥6.2	≥7.5	≥7.5	≥7.5
Attrition loss rate（%）	≤5	≤5	≤5	≤5	≤5	≤5

Remarks:

1). Type S101 series of broad temperature catalysts' ignition temperature is 400℃. For continuous operation, the temperature should be in the range 420-620℃, which suit for every bed of converter for its high and stable activity.

2). Type S108 series of low temperature catalysts' ignition temperature is 380℃ and operating temperature 400-540℃, which suit for 1/3 top of the first bed to decrease inlet operating temperature, and 4th bed, 5th bed to improve equilibrium conversion and decrease gas emission.

3). Different catalyst shapes is a result of the desired to reduce catalyst bed pressure drops which translates directly into energy savings as a result of reduced blower power consumption. Reduced pressure drops also allow more dust to accumulate before pressure drops increase to the point where the plant must be shutdown for catalyst screening. The catalyst shape must achieve all of the above without compromising on catalyst activity or mechanical strength.

4).The length of catalysts can be made according to the user's requirement.

5). For more details, please contact with us

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Our catalyst experts will assist in selecting the optimum catalyst type and shape for each bed in any converter design.