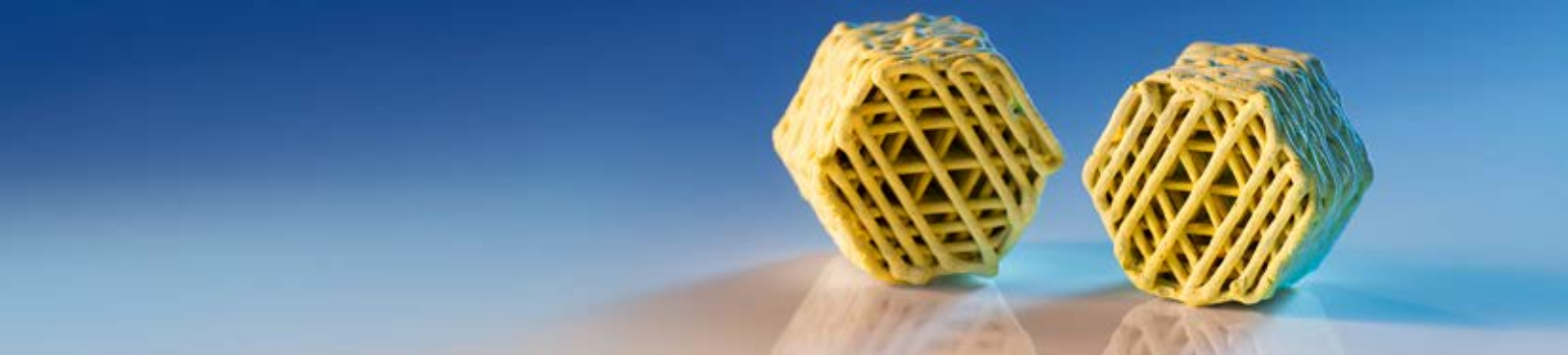
BASF X3D® Technology

Sulfuric Acid Catalysts based on 3D Printing

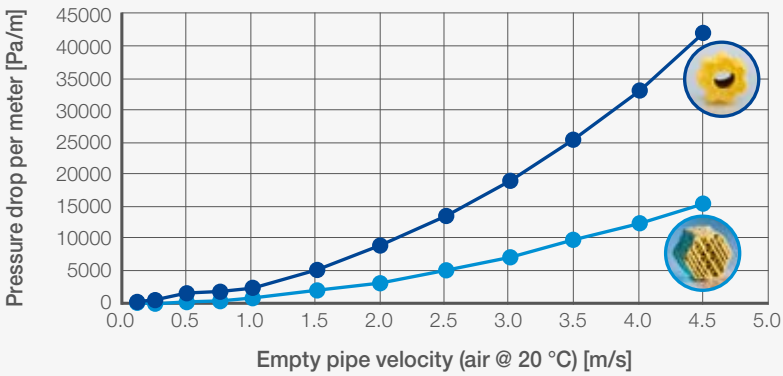
We create chemistry



The next step change in sulfuric acid production: Higher surface area, lower packing density and significantly lower pressure drop.

Physical property	Star Ring	Quattro	X3D®
Packing Density [kg/m³]	450	450	400–420
Rel. Geometric Surface Area [%]	100	130	150–160
Pressure Drop Re=100 [%]	100	100	35 ±10
Operation Data O4-115 (Cs)	**Star Ring**	**Quattro**	**X3D®**
Ignition Temperature [°C]	340	330	310
Operating Range [°C]	390–630	375–630	350–630

BASF's X3D® technology offers **66% lower pressure drop** when compared to Star Ring shape.



Simulated pressure drop: Star Ring shape X3D® shape

BASF's X3D® Technology enables a significant contribution for emission reduction & energy cost savings

Example: BASF sulfonation plant 32 MTPD capacity*

Measure	Outcome	Savings/year
Increased conversion by 1%	Decreased NaOH consumption due to higher conversion	80 k€
Decreased pressure drop by 77%	Decreased electricity consumption due to higher conversion	18 k€
Combined	**Savings in CO_2 equivalents**	**168 tons of CO_2 equivalents**

* Sulfuric acid equivalents

BASF Specialty Oxidation

Catalysts Product Portfolio

Product Overview

		O4-110	O4-111	O4-115	O4-116
Shape and size					
Star Ring SS 11x4mm	Ignition Temperature	380°C[2]	360°C[2]	340°C[2]	330°C[2]
	Operating Range	420–630°C[3]	410–600°C[3]	390–630°C[3]	380–600°C[3]
Quattro 13x3.2mm	Ignition Temperature	370°C	350°C	330°C	320°C
	Operating Range	410–630°C	400–600°C	375–630°C	365–600°C
X3D®	Ignition Temperature		[5]	310°C	
	Operating Range		[5]	350–630°C	
Dust Collection SR 18x7mm[1]	Ignition Temperature	380°C			
	Operating Range	420–630°C			
Thermal stability		630°C[4]	600°C	630°C	600°C
Packaging		200 l drum 1,000 l big bag	200 l drum 1,000 l big bag	200 l drum 1,000 l big bag	200 l drum 1,000 l big bag
Typical applications		First Bed Second Bed possible	Second to Fourth or Fifth Bed	First Bed Fourth or Fifth Bed Other Beds possible	After intermediate absorption Fourth or Fifth Bed

1) The SR18x7 Ring will only be delivered in a 200 l drum
2) In continuous operations generally 30–50°C higher
3) Depending upon gas composition
4) Continious operation peaks up to 650°C
5) Available on request

BASF offers Full Systems Design for:

- Performance reliability from planning through all phases of plant operation
- Simulations of plant operations
- Converter design calculations
- Highest conversion requirements
- Capital investment optimization
- SO_2 emission reduction
- Environmental protection maximization

Knowledge: Ours becomes Yours

Profit from the deep expertise and know-how we have acquired from operating our own state-of-the-art sulfuric acid plants since 1913. The production support and asset utilization mastery of our technical services will help you work more efficiently, with less downtime, and higher profits.

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