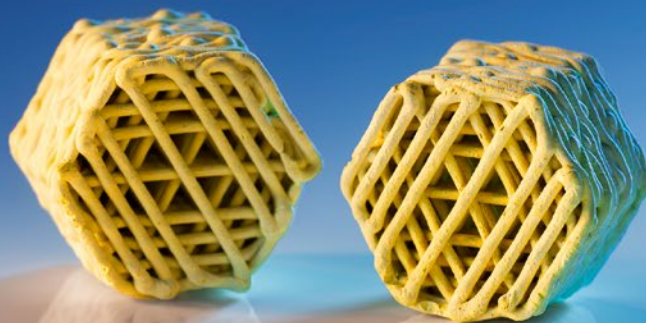


BASF X3D® Technology

Sulfuric Acid Catalysts Based on 3D Printing



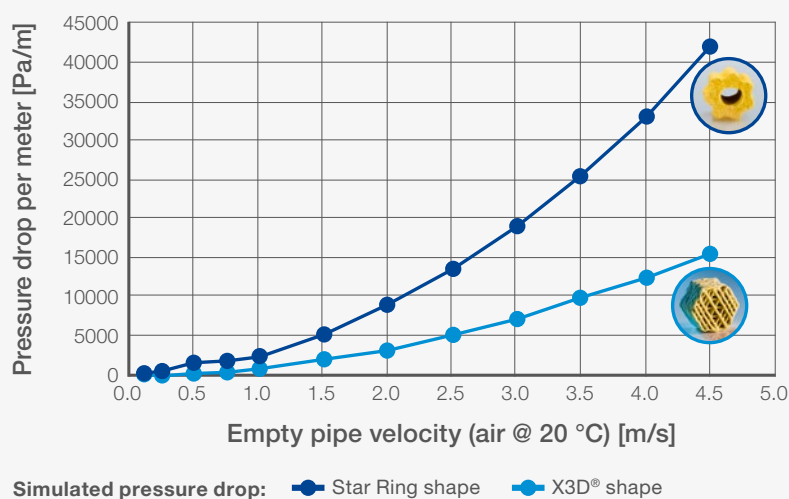
We create chemistry



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	420
Rel. geometric surface area [%]	100	130	150
Pressure drop $re=100$ [%]	100	105 ±5	35 ±10

66% Lower pressure drop when compared to Star Ring shape.



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

Example: BASF Sulfonation plant (32 MTPD sulfuric acid equivalent capacity), reactor bed 3 exchanged with O4-115 X3D®

Measure	Outcome	Savings/p.a.
Increased conversion by 1.0 %	Caustic NaOH consumption at scrubber due to higher conversion	36 % or 162.4 tons
Decreased pressure drop by 77 %	Decreased electricity consumption due to lower pressure drop	6 % or 106 MW

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	5)
	Operating Range		5)	350–630°C	5)
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) Continuous 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
- SO₂ 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.

Americas

BASF Corporation

Phone: +1-732-205-5000

Email: catalysts-america@basf.com

Europe, Middle East, Africa

BASF Services Europe GmbH

Phone: +49-30-2005-5000

Email: catalysts-europe@basf.com

Asia Pacific

BASF (China) Company Limited

Phone: +86-21-2039-1311

Email: catalysts-asia@basf.com

