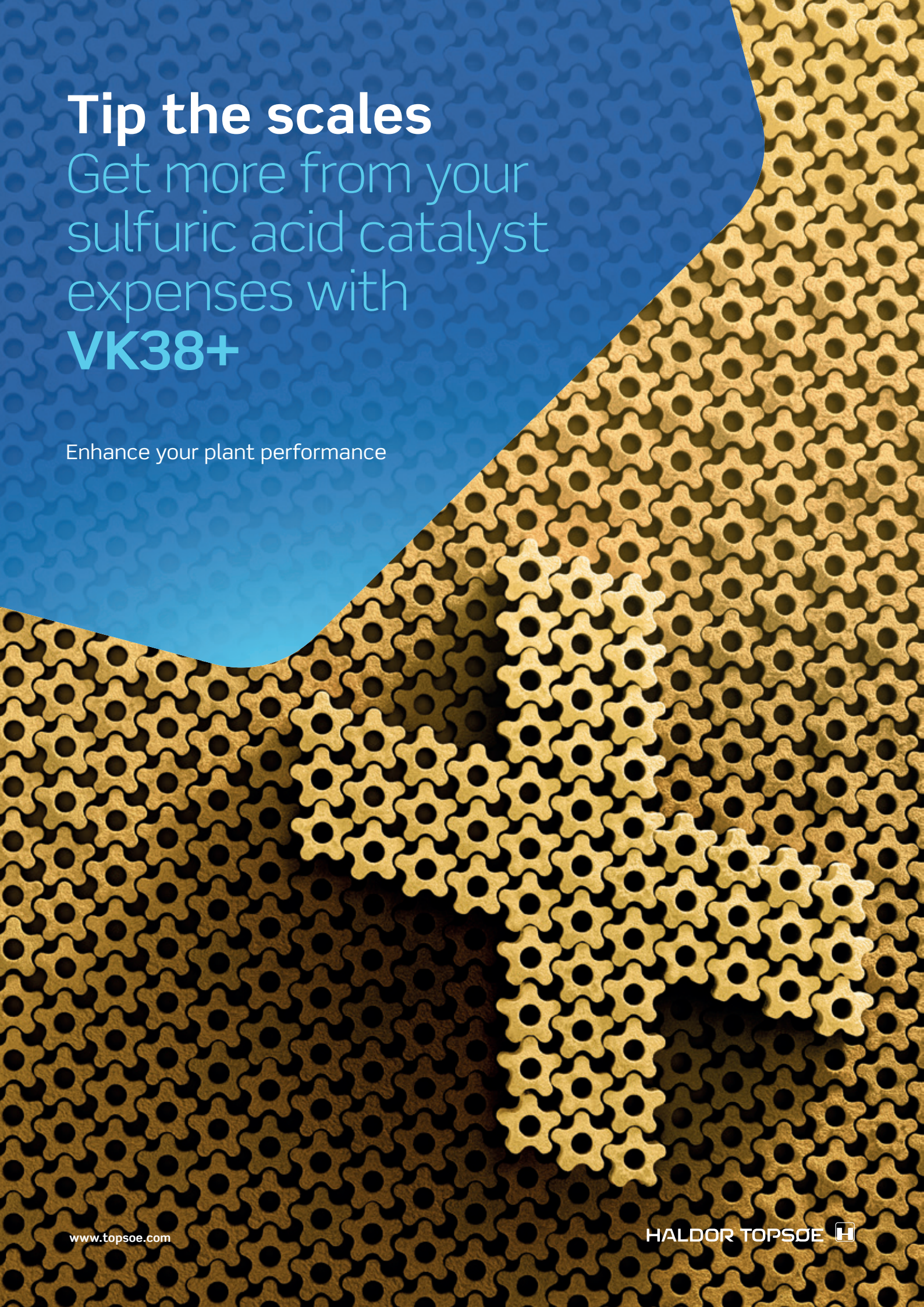
Tip the scales

Get more from your sulfuric acid catalyst expenses with **VK38+**

Enhance your plant performance



www.topsoe.com

HALDOR TOPSØE

Choosing **catalysts** is a percentage game. Here's a cheat code: **VK38+**

Tip the scales

Selecting the right catalysts for a SO_2 converter has always been about balancing expenses and gains. The new VK38+ helps create that balance – and more.

VK38+ is potassium-promoted catalyst that is part of a range of proven, top-performing sulfuric acid catalysts from Topsoe. As the highest performing potassium-promoted catalyst on the market, V38+ performs like a premium Cs catalyst but is priced like a standard and can be used in all SO_2 converter beds.

Combined with our unparalleled service and advisory team, you can get more from your catalyst expenses. Tip the scales to your advantage by enhancing your performance, improving efficiency, and reducing your climate footprint.

"After installing VK38+ in bed 2 the temperature increase is higher than ever. Together with a top up of bed 1, the VK38+ has increased conversion to a point where there's hardly any SO_2 left for beds 3-5 to convert."

PETER ANDERSSON, Process Engineer, Kemira Kemi AB

Running at the limit? **Push** the **limits** with **VK38+**

What tipping the scales means for your business

Emissions limits are tightening globally, adding challenges to sulfuric acid plants already operating with fully loaded converter beds.

As a plant operator, you are faced with the ultimate balancing act: how can you comply with local regulations while maintaining productivity and limiting costs?

Decreasing capacity and rebuilding existing plants are two options for staying compliant, but they are costly and ineffective solutions. Operators need something that will allow them to utilize all beds efficiently and effectively. For that, there's V38+.

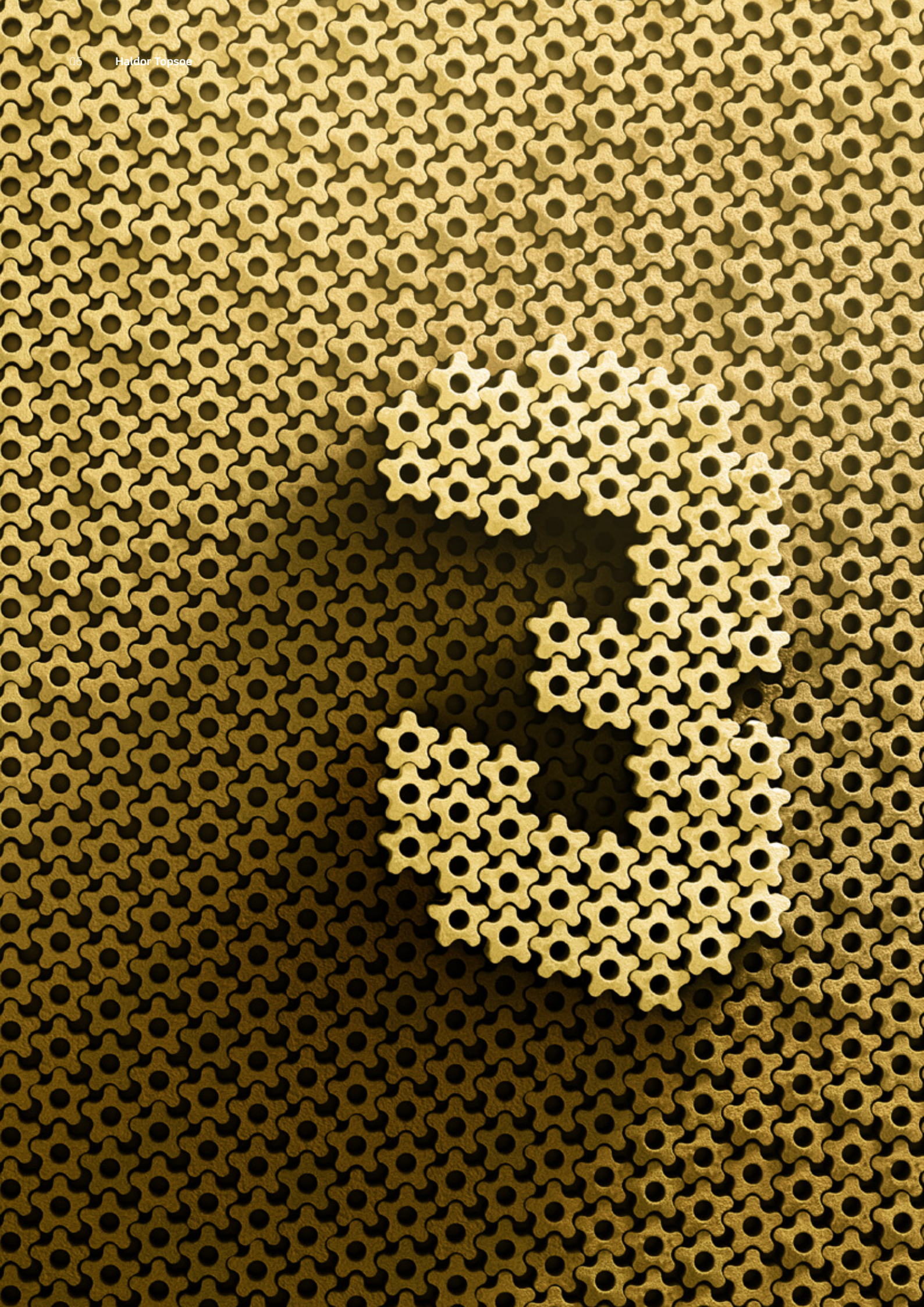
Sustainable, powerful, cost-effective

VK38+ lets you replace your current potassium-promoted catalysts with something much more effective. With this groundbreaking new catalyst, you can reduce emissions and increase production without making costly new investments.

Depending on how you choose to utilize it, the VK38+ catalyst can decrease pressure drop, boost production, lower energy consumption, increase catalyst lifetime by up to 80%, and lower emissions. No matter your strategy, you will get better performance using less catalysts.

VK38+ benefits

- **Reduce emissions** by ~35% over existing VK38/48 loading
- **Lower catalyst waste** and raw material use by ~50%
- **Take down power consumption** by ~10% due to capacity for higher feed concentration
- **Increase power output** with higher steam production at the same load
- **Decrease or avoid chemical consumption** in existing scrubbers
- **Reuse more existing catalysts**



The **premium** solution is the most **cost-effective** solution, too.

How VK38+ tips the scales

V38+ is the highest performing potassium-promoted catalyst on the market, and it can be used in all SO2 converter beds. That's not just more sustainable, it's also useful for your bottom line. Calculations show an up to 40% reduction of long-term catalyst spending and a payback time of only a few months.

This advantage is mainly gained through increased capacity and a smaller pressure drop, but you can also boost production by increasing feed flow rates and SO_2 concentration. With VK38+, you can dramatically increase cycle lengths, avoid expensive revamps and new units, and reduce scrubber chemical consumption.

Add VK38+ to beds 1 and 2 and use lower inlet temperatures, which allow for increased process energy extraction and more high-pressure steam for the waste heat boiler. As for sustainability, VK38+ can decrease the catalyst consumption, in turn reducing the raw materials needed for production.

Level-up your production

- Increase production by ~15% by replacing the existing VK38/48 loading with VK38+
- Increase capacity by ~35% when combining the VK38+ with VK69
- Gain 5% more capacity by increasing SO_2 strength

Longer catalyst lifetime

More performance, less catalysts

Long-term production efficiency

Lower operational cost

We offer some of **the** industry's **best-performing** catalysts. But we don't always **recommend** them.

Our team helps you tip the scales

When it comes to sulfuric acid conversion, no two operations are exactly alike. Small variations in setup, business needs, market demands, and local legal requirements add up to big differences.

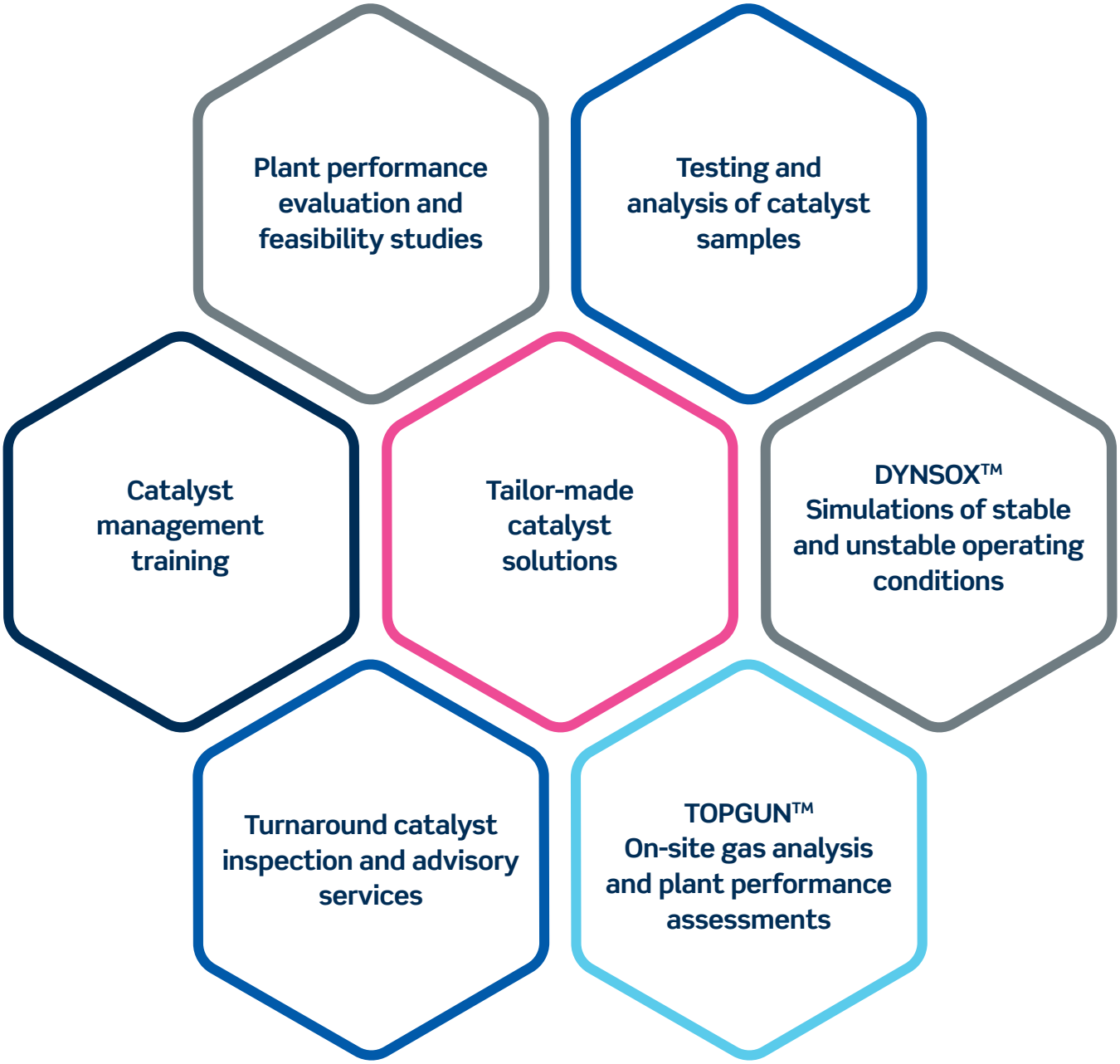
That's why we always view your operations and business in the bigger picture. With Topsoe, you get the world's leading solution provider within the field of sulfuric acid catalysts. You also team up with a company that takes a uniquely holistic approach to your plant and your business.

We fully leverage our expertise to find a thoroughly tailored solution that tips the scales to your advantage. Because with our wide range of catalysts, there's always a relevant one to recommend.

All the skills and services you need
Working with Topsoe means working with skilled engineers that help you support your yields and profits, reduce costs, and secure compliance with SO_2-related regulations.

Gain peace of mind with access to a team that can help tackle the big and small challenges that you face each day, and get access to a comprehensive technical service program that includes testing of catalyst samples, catalyst performance evaluations, plant optimization tools, troubleshooting, and catalyst replacement management tools.

Plus - of course - documented calculation tables for each catalyst offering.


Plant performance evaluation and feasibility studies
Testing and analysis of catalyst samples
Catalyst management training
Tailor-made catalyst solutions
DYNSOX™ Simulations of stable and unstable operating conditions
Turnaround catalyst inspection and advisory services
TOPGUN™ On-site gas analysis and plant performance assessments

In the 1980s, catalysts were considered fully developed. Ever since, we have **kept** on **developing** them.

Our range of catalysts helps you tip any scale

At Topsoe, eight decades of expertise and dedication to R&D have led to the development of some of the most advanced catalysts on the market.

Today, we offer the industry's largest range, including dust-protection, cesium-promoted and LEAP**5**™ designs.

This means we can help you find the precise loading strategy that meets all your needs at the lowest cost possible.

Tip the scales and learn more go to
topsoe.com/processes/sulfuric-acid

VK38+
With enhanced performance, more efficiency and a reduced climate footprint, VK38+ provides a string of benefits at a standard cost. It can be used in all SO_2 converter beds and is the highest performing standard potassium-promoted catalyst on the market.

VK38
The VK38 formulation provides excellent activity over a wide range of operating conditions and can be used effectively in all beds of any SO_2 converter.

VK48
VK48 is a high vanadium version of the standard all-round VK38 catalyst. The catalyst composition is specifically formulated for lower pass service, particularly where the process gas contains large amounts of SO_3.

VK59
VK59 is a cesium-promoted catalyst optimized for medium to high-strength SO_2 gasses with continuous operation down to 370°C (700°F).

VK69
VK69 is designed specifically for the final pass(es) of double absorption plants. In the lean SO_2 gas environment after the inter-pass absorption tower, the unique VK69 formulation offers unmatched high activity throughout the entire operating temperature range.

LEAP5™
LEAP**5**™ catalysts are specifically designed for oxidizing SO_3-strong gases and are ideal for use in the last passes in single-absorption plants or in the third pass in 3+1 and 3+2 double-absorption plants.

About Haldor Topsoe A/S

Haldor Topsoe wants to be the global leader within carbon emission reduction technologies for the chemical and refining industries. By perfecting chemistry for a better world, we enable our customers to succeed in the transition towards renewable energy. Topsoe is headquartered in Denmark and serves customers around the globe.

Get in touch today
info.topsoe.com/vk38plus

Haldor Topsoe A/S, cvr 41853816 | GMC | 0327.2020/Rev.0

HALDOR TOPSØE