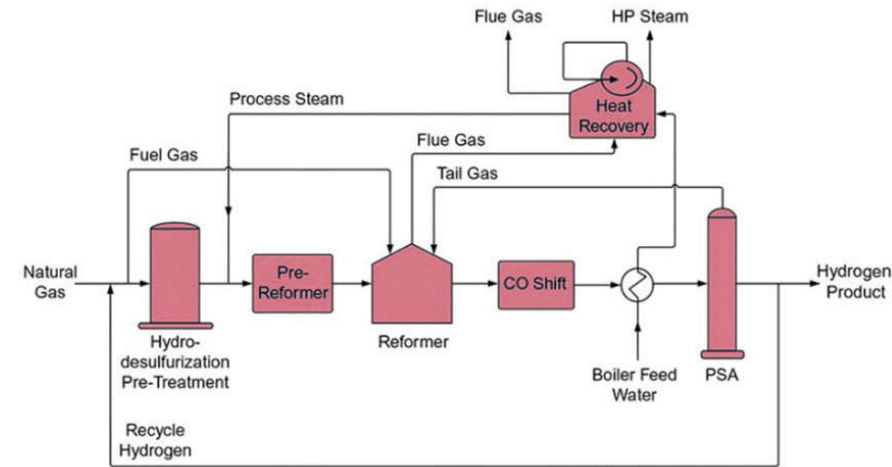




## Hydrogen Gas Case History

**Location** Alberta, Canada

**Process** Steam Methane Reforming (SMR) Technology  
Small and large hydrogen production cost-effective and energy efficient. High levels of purity by employing in-house Pressure Swing Absorption purification technology.



### Products

JP/JG Vario: This is our high-performance stainless steel / gasket gasket with the Vario self centering system. The Vario option allows gaskets to cover up to 8 pressure classes and reduce inventory costs.

### Process Conditions

SMR - typical working conditions are 390 to 425° C (800 F) and 40 Bar (580 psi).

However other media used in the process like Ammonia, can increase temperatures to 670 °C (1238°F).

### Benefits

Due to the pressure swings on the original gaskets, the JP gaskets provided a much lower leak rate and significantly improved blowout resistance compared to Camprofile and spiral wound gaskets.

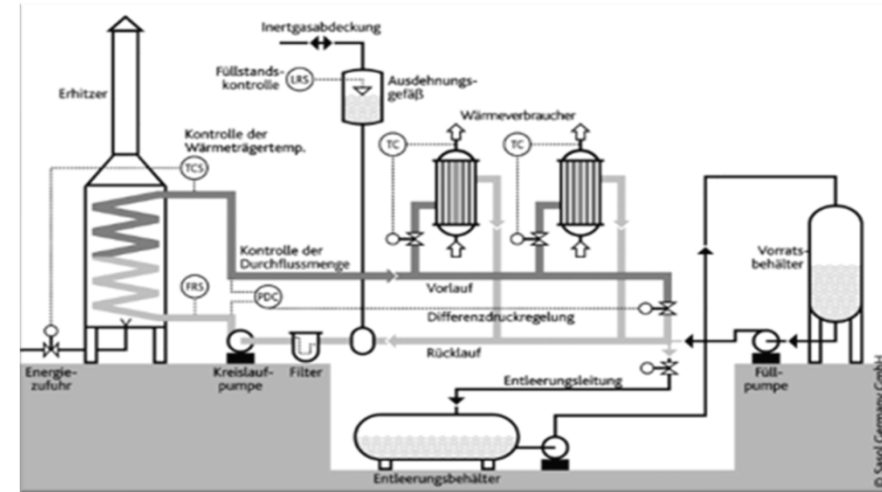
The JP Vario self centering system was also able to reduce inventory costs as several pressure classes could be covered with one gasket.



**Polyesterpolyole Case History**

**Location** Dormagen, Germany

**Overview** Some heat transfer processes in polyester production require high temperatures. These cannot be achieved with water due to the high vapor pressure without great expenditure on equipment. To obtain the high temperatures required for the process at moderate pressures, organic heat transfer media are used.



Products	Process Conditions	Benefits
<p><b>Revolution – 316Ti / Graphite –</b> encapsulated graphite</p>	<p>Marlotherm Heat Transfer Temperature of 360°C (680°F) and Pressures of 10 bar (145 psi).</p>	<p>Tanged graphite gaskets were replaced with the Revolution gasket. This gasket eliminated the need to constantly re-tighten the bolts due to gasket deformation and compression. Additionally, the Revolution was able to withstand fluctuations in pressure and aggressive thermal transfer fluids, whereas the tanged graphite could not.</p>



**Refinery Case History**

**Location** Gelsenkirchen, Germany

**Overview**

- Fluid catalytic cracking (FCC)-> very important conversion processes in petroleum refineries processes
- High-boiling, high-molecular weight hydrocarbon fractions of petroleum crude oils -> into more precious gasoline, olefinic gases and other

**Challenges**

- Low bolt forces
- Thin walls / weak flange geometry
- Low strength flange materials
- Non-standard geometries

**Special advantage in this case**

- High surface pressure even at low bolt force
- Adaptable design with tailor made solution

Products	Process Conditions	Benefits
<p><b>JP</b> / Graphite design provided excellent sealing at lower torque loads while increasing high temperature life.</p> <p><b>ECO+</b> (spring-tooth-gasket) replaced tanged graphite gaskets as well.</p>	<ul style="list-style-type: none"> <li>• FCC (Fluid catalytic cracking)</li> <li>• Vacuum distillation</li> <li>• Gasoline desulfurization</li> <li>• Hydrotreater</li> </ul> <p>Temperatures up to 400 °C (750 °F) and pressures ranging from 16-30 bar (230-435) psi.</p>	<p>One advantage of the Revoseal JP gasket is that it significantly reduced the leak rate. Another was that it was able to maintain an acceptable seal, while a leak tight seal could not be archived with a Camprofile.</p> <p>The calculations showed that the flange was too weak for Camprofile gaskets and significantly more force was needed, but could not be applied.</p>



**PVC Production Case History**

**Location** Cologne, Germany

**Overview** During the production of PVC it is necessary to separate the suspension into its component parts by means of a degassing process.

Products	Process Conditions	Benefits
<p><b>Revoseal JG</b> with 316Ti &amp; Graphite</p>	<p>Media: Lye suspension at temperatures of up to 90°C and pressures of 0.25 to 3.6 bar in a column volume of 32,150 cubic meters consisting of 10 segments each with gaskets in between each column segment.</p>	<p>The Revoseal JG gasket provided improved sealing during temperature excursions and maintained higher temperatures in the top half of the column; whereas the existing Camprofile type gaskets could not hold a reliable seal.</p>



**Steam Reformer Chemical Case History**

**Location** Leuna, Germany

**Overview** In the steam reformer, hydrogen is produced with the help of natural gas. The products are supplied in both gaseous and liquid form to a wide range of customers.

<b>Products</b>	<b>Process Conditions</b>	<b>Benefits</b>
<p><b>Revoseal ECO+</b> (spring-tooth-gasket design) with 316Ti and Graphite.</p>	<p>Media: Nitrogen and Steam. Temperatures of -150°C and pressures of 80 bar</p>	<p>The Eco+ gasket could achieve better sealing at lower bolt torque loads. Compared to the existing graphite spiral wound and Camprofile gasket types, the Eco+ improved sealing, minimized blowouts, and greatly improved the life of the gaskets.</p>



**Anorganic Chemical Case History**

**Location** Frankfurt, Germany

**Overview** Production of polychlorinated fluoridic hydrocarbonates – Commonly used for refrigerant fluids and pharmaceutical propellants.

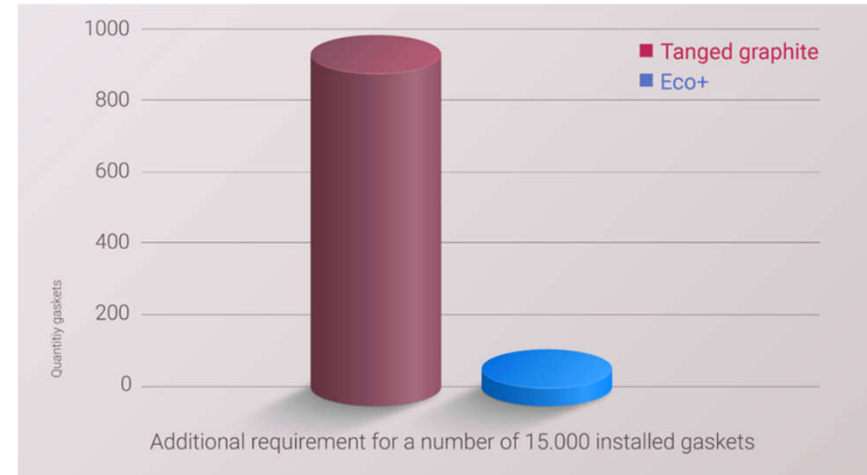
Products	Process Conditions	Benefits
<p><b>Revoseal ECO+</b> (spring-tooth-gasket design) with 316Ti and Graphite</p>	<p>Media: HF, CH, Oxygen, and R134a/R133a</p> <p>Temperatures of -200 C to 430 C. Pressures of vacuum to 160 bar</p>	<p>The advantages accomplished with Revoseal ECO+ gaskets extended the lifetime to 5 years compared to 3-9 months using a traditional spiral wound gasket. This allowed the company to easily reach their annual outage goals to inspect and replace when necessary, rather than experience unexpected outages.</p>



**High Temperature Catalytic Cracking Case History**

**Location** Germany

**Overview** Installed in cracker plants under professional installation in accordance with VDI 2290



Products	Process Conditions	Benefits
Revoseal ECO+ with 316Ti and Graphite or PTFE layers	Temperatures of -200°C to +500°C. Pressures of vacuum to 160 bar	According to the SAP evaluation, 6.6% of the 15,000 competitor seals leaked within one year. In addition to the negative effects of an unscheduled shutdowns, costs were reduced as the need for the additional seals was eliminated with the use of ECO+.