Quadax®
müller coax group

QUADAX® PREMIUM VALVES -
MADE FOR THE EXTREME

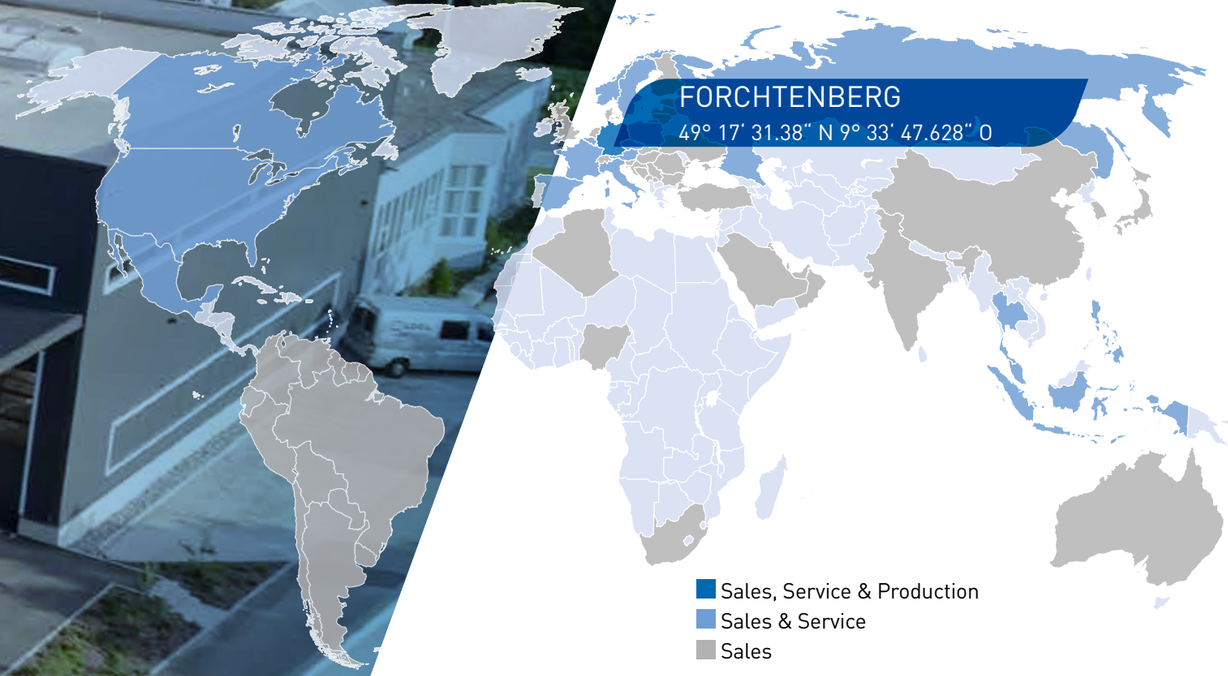
www.quadax.de

QUADAX®
MADE FOR THE EXTREME

CONTENT

MÜLLER QUADAX®
MEMBER OF THE
MÜLLER CO-AX® GROUP

WHEN TECHNOLOGY PERFECTS GEOMETRY



QUADAX® LOCALLY ANCHORED, GLOBALLY PRESENT

Our headquarters are located in southern Germany. Our products are designed for worldwide use - wherever extreme pressure or temperature ranges are required. Design, machining and production are always state-of-the-art. For our customers, we combine the values and flexibility of a family business with a long-term perspective and the professionalism of a global player. The same applies to our employees; they are our most valuable asset and the path to a successful future.

QUADAX® PRODUCTION

STATE-OF-THE-ART TECHNOLOGY - 100% MADE IN GERMANY

WHAT IS ENOUGH TODAY WILL BE TOO LITTLE TOMORROW.
WE ARE CONTINUOUSLY INVESTING FOR THE FUTURE.

Thanks to the new manufacturing facility with larger capacities in the areas of painting, assembly, testing and shipping, müller quadax gmbh is consistently pursuing its growth targets and continuously expanding its services to its customers. More space was created to accommodate additional 5-axis machining centres to meet the increasing demand for QUADAX® premium valves.

We manufacture all critical parts of our premium valves in-house. This makes us independent, reliable and flexible. Customer-specific adaptations or special versions can be implemented quickly and are customer-specific reproducible even after years.

We strive for continuous improvements in our processes. This is to the benefit of our customers.

- **MODERN, EFFICIENT AND PROCESS-SAFE 5-AXIS MACHINING CENTRES**
- **LEAN MANUFACTURING, ASSEMBLY AND HANDLING**
- **CONTINUOUS MONITORING UNTIL SHIPMENT**
- **HIGHEST FLEXIBILITY, GLOBAL PROCUREMENT, SHORT DISTANCES INCLUDING OWN PAINTING**
- **STATE-OF-THE-ART CLEAN ROOM**
- **PREMIUM VALVE AUTOMATION AND ENGINEERING**

QUADAX® PRECISION
IS THE BASIS OF OUR SUCCESS

WHEN TECHNOLOGY PERFECTS GEOMETRY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TOP QUALITY IS A PRECONDITION FOR A PREMIUM VALVE

This is part and parcel of our philosophy, which is not only shared by every single employee, and which is therefore practiced in all phases of manufacturing. We set the highest demands for value and reliability. As a result, our premium valves meet the requirements of extreme applications in which they are successfully used.

Our customers can trust in receiving a premium valve that makes no compromises in terms of functionality, longevity and durability. We deliver solutions that exceed the expectations of many of our customers: Our premium valves only leave our factory when they have passed our stringent internal tests 100%!

BEST QUALITY THANKS TO BEST EQUIPMENT

1.
Functional and high-quality design supported by latest 3-D software and process experience

2.
Process-safe, precise and efficient machining through CAM programming

3.
Quality through standards, identification, automation and precise 3-D measuring systems

CERTIFICATIONS / STANDARDS


ZERTIFIKAT

Die Zertifizierungsstelle der TÜV SÜD Management Service GmbH bescheinigt, dass die Unternehmen

müller co-ax ag
Gottfried-Müller-Str. 1, D-74670 Forchtenberg

Geltungsbereich
Entwicklung, Produktion, Montage und Vertrieb von Ventilen und Ventilbaugruppen sowie Armaturen

cx-tec gmbh
Untere Au 4, D-74670 Forchtenberg

Geltungsbereich
Vertrieb von Ventilen und Armaturen

ein Qualitätsmanagementsystem eingeführt haben und anwenden.
Durch ein Audit, Bericht-Nr. 70003498
wurde der Nachweis erbracht, dass die Forderungen der

ISO 9001:2008

erfüllt sind. Dieses Zertifikat ist gültig bis 2015-11-02
Zertifikat-Registrier-Nr. 12 100 20296 TMS

- **TÜV SÜD** ISO 9001:2015
- **CE** 0036 certification
- **TA-Luft / ISO 15848-1**:2015 Kl. BH / API 641
- **Fire-safe according to** ISO 10497, API 607, BS 6755
- **BAM** certification
- **EAC** certification / TR CU 010 / 032 /012
- **AD** 2000 A4, W10 HPO
- **ANSI** B16.34 / EN 12516
- **PED** 014/68/EU
- **Tightness leakage rate A** EN12266 / API 598 / FCI 70-2 class VI
- **SIL 3** (safety integrity level)
- **MRGL** (Machinery Directive)
- **Marine type approval DNV-GL,** Lloyds Registers
- **Cryogen** acc. to BS6364 / EN 12567
- **Atex** 2014/34/EU incl. Zone 0

... we have more certifications! If you cannot find a certificate in the list, simply ask us by e-mail (info@quadax.de).

QUADAX® APPLICATIONS
HIGHEST TIGHTNESS, SAFETY AND FUNCTIONALITY

APPLICATIONS

Due to the absolutely unique design, the 4-offset construction and a special manufacturing technology, QUADAX® meets the highest tightness requirements even in extreme pressure and temperature ranges.

This makes the QUADAX®butterfly premium valves ideally suited for use in the oil and gas industry, petrochemicals, cryogenics refineries, LNG + LPG and many other extreme applications.

PROVEN QUALITY / CREDENTIALS

With 40,000 premium valves installed, the 4-offset technology from QUADAX® has proven itself through high functionality and tightness.

This technology has been particularly successful in demanding applications with bi-directional sealing and process-related, changing temperature cycles.

GLOBAL APPLICATIONS AND CREDENTIALS SUBSTANTIATE OUR UNIQUE SELLING POINT IN APPLICATIONS SUCH AS:

1 LNG/LPG SYSTEMS
2 THERMOSOLAR SYSTEMS
3 INDUSTRIAL GASES
4 DISTRICT HEATING SYSTEMS
5 CHEMICAL PROCESSES
6 POWER PLANTS & ENERGY
7 HYDROGEN
8 SHIPBUILDING
9 OIL & GAS UPSTREAM
10 OIL & GAS DOWNSTREAM
11 CRYOGENIC APPLICATIONS
12 OXYGEN APPLICATIONS
13 COMPRESSORS & TURBINES
14 AEROSPACE TERMINALS

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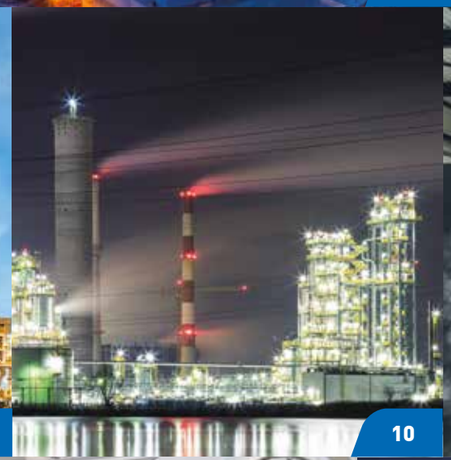
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QUADAX®
APPLICATION BROCHURE
ONLINE

QUADAX® HIGH OR LOW TEMPERATURE

KEEP COOL!

-270 °C up to **+800 °C**

-450 °F up to **+1,472 °F**

HIGH TEMPERATURE APPLICATIONS

Especially in chemical or petrochemical processes, changing temperature cycles can occur in a very short time. One of our international customers was faced with such an extreme application where conventional 3-way eccentric butterfly premium valves failed.

The medium, in one application, was hydrogen and the temperature difference ranged from +450 °C (+842 °F) to ambient temperature within 20 minutes, which would be a major test for any design or material. The QUADAX® DESIGN is working without issues.

With our unique 4-OFFSET PREMIUM VALVE DESIGN, QUADAX® is the best solution for these demanding applications. The perfectly round sealing geometry ensures a homogeneous wall thickness of the sealing ring and guarantees maximum tightness with a very long service life.

CRYOGENIC APPLICATIONS / LOW TEMPERATURES

A liquid is called "cryogenic" when it is cooled below its usual boiling point down to -90 °C (-130 °F). Such temperatures are found in various applications such as air separation plants, chemical plants and LNG plants. When used with liquid hydrogen, the QUADAX® functions perfectly even at temperatures of -253 °C (-423.4 °F).

Here, too, the round seal geometry is impressive. Even when the material shrinks and expands due to extreme temperatures, QUADAX® keeps its promise of maximum tightness.

QUADAX® UNDER TEST

ALL EXPECTATIONS SURPASSED! ENDURANCE TEST WITHOUT LEAKAGE

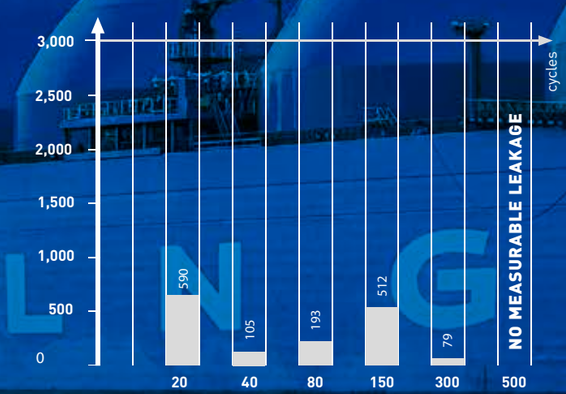
REFERENCE PROJECT LNG TERMINAL

ADVANTAGES OF THE QUADAX® BUTTERFLY PREMIUM VALVES

At LNG terminals, the imported liquid natural gas at a temperature of -165 °C (-265 °F) is unloaded at special docking fixtures by gas tankers and stored in large LNG storage tanks. Prior to delivery to the supply network, the liquefied gas is then uniformly heated and thereby gasified again.

The müller quadax gmbh was been awarded a contractfor a large-scale order for Top Entry butterfly premium valves as replacement for Side Entry butterfly premium valves in an existing LNG system and for an extension with a new LNG terminal. Along with the LNG tankerloading ramps, this terminal located in Europe also comprises 3 loading ramps for trucks and a specialjetty for small (bunker) ships. During storage and transport, natural gas could enter the atmosphere especially at critical components such as measuringdevices and process premium valves. Apart from the negative effects on the environment, these fugitive emissions could also affect the personnel safety. The operating company of this LNG terminal has demanded an individual performance test for the approval of cryogenic part-turn premium valves which shall be installed in their terminals and storage tanks. For this purpose, the cryogenic test according to BS 6364 was combined with an endurance test according to EN 12567. An additional requirement was to pass an endurance test, where after 500 mechanical switching operations at -196 °C (-320 °F), the internal and external leakage was measured after particular cycles. The guide value with regard to the seat leakage is less than 3,000 ml/min for a premium valve of DN 500 on the basis of the standard BS 6364 and a maximum permissible fugitive emission of >1.0–10–3 mbar_l_s-1 at any point in time of the cycles. The testing institute ITIS BV attested that the seat leakage never exceeded the already low value of 590 ml/minute and no leakage at all was detected after 500 cycles! In the process, the fugitive emissions were clearly below the standard and hardly measurable.

Max. allowable internal leackage acc. to BS6364 for DN 500 = 3,000 ml/min.



Measured leackage in ml/minute at -196°C (-320 °F) with helium after each of the indicated cycles.

QUADAX® FEATURES
HIGHEST TIGHTNESS, FUNCTIONALITY AND RELIABILITY

NOMINAL WIDTH
DN 50 (2") - DN 1,800 (72") and up to 160 bar (2,320.6 psi)
Available up to DN 1,800 mm (72") and larger / available up to 160 bar (2,320.6 psi) and higher

TEMPERATURE RANGE
from –270 °C to +800 °C
from -454 °F to +1,472 °F

TIGHT IN BOTH DIRECTIONS
- Up to full differential pressure
- Round seal and seat geometry
- Inconel sealing seat as standard
- Even with changing pressure and temperature loads

MAXIMUM TIGHTNESS
Also in cryogenic applications

METAL SEAL RING
Various versions up to full metal seals possible

SELF-CENTERING DISC
Highest tightness even at high Δt

NO MOVEMENT
Between disc and seal – therefore highest tightness with lowest wear

MINIMISED FLOW SHADOW
Thanks to 4-offset design. Higher KV value and flow-optimised disc profile

MOST MINIMUM SHAFT DEFLECTION
Even at high pressures due to load-bearing shaft feedthrough

QUADAX® BENEFITS
THE BENEFITS SPEAK FOR THEMSELVES

EXTREME TEMPERATURE RANGES
- Same wall thicknesses all around at seat and seal
- Extreme temperatures from –270°C (-454 °F) to +800 °C (1,472 °F)
- Even large temperature differences are compensated

MAXIMUM TIGHTNESS
- Meets the highest tightness requirements
- Bubble-free tightness even in cryogenic applications
- Innovative and patented design of the seat sealing

INCREASED PROCESS SAFETY
- Low friction and low wear
- Reduced risk of failure
- Clamp-free seat geometry
- Longer service life and functionality
- Quick closing < 1 second

REDUCED PROCESS COSTS
- Higher kv/cv values and thus lower energy loss
- Smaller dimensioning of the nominal pipe width
- Smaller drives due to optimised torque effort
- Combination of shut-off and control
- Reduced maintenance costs

-270 °C up to **+800 °C**

-450 °F up to **+1,472 °F**

QUADAX® DESIGN FEATURES

QUADAX SIMPLY A ROUND THING

ADVANTAGES OF THE 4-OFFSET DESIGN

3-OFFSET DESIGN

- The sealing seat is elliptical.
- Wall thicknesses are not homogenous.
- In case of high temperature fluctuations, **uneven** material expansion of the seat and sealing ring occurs.

- Due to the elliptical shape, friction between the sealing ring and the sealing seat occurs.

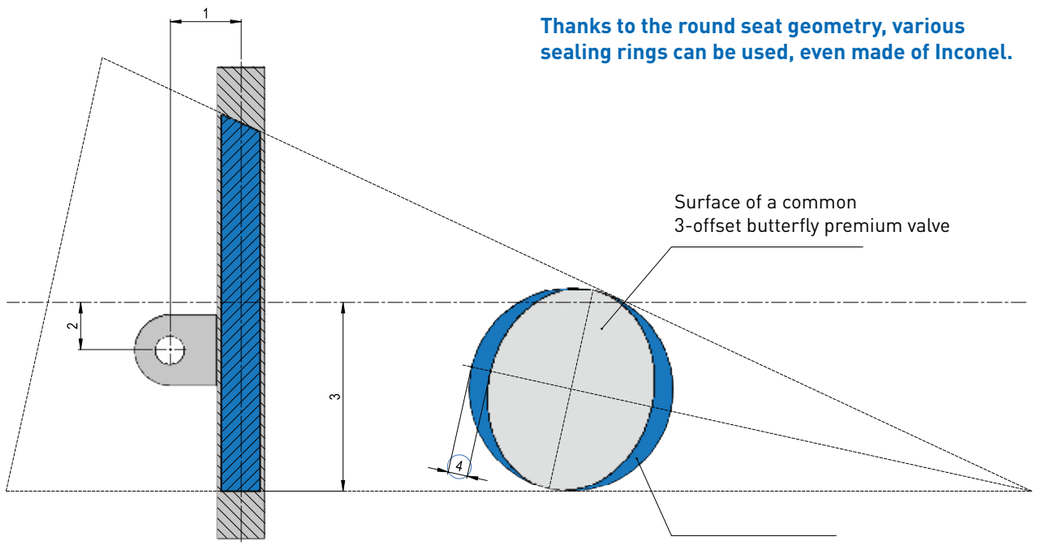
- Friction causes undefined wear at higher switchin cycles and load changes.

4-OFFSET QUADAX® DESIGN

- Seal seat is conical and perfectly round.
- Wall thicknesses are homogenous.
- In case of high temperature fluctuations, **even** material expansion of the seat and sealing ring occurs.

- There is a reduced contact between the sealing ring and the sealing seat in the shaft area.
- Thanks to the round cone geometry, swivelling in and swivelling out of the seat is **optimised and frictionless.**

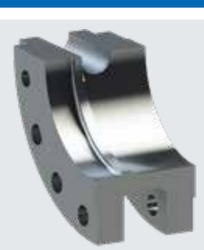
Thanks to the round seat geometry, various sealing rings can be used, even made of Inconel.



IN ADDITION FOR HIGHEST TIGHTNESS & SAFETY

QUADAX® FULL DISC DESIGN

- The disc is guided and supported by the shaft over its entire length.
  The sealing ring is supported and positioned as best as possible by the disc.
- **Bending of the shaft is almost excluded.**
- This provides **additional safety.**



The housing is in one piece.
The sealing seat is solid and consists of Inconel by default.

QUADAX® FLOATING DISC DESIGN

Bearing of the disc on the shaft.

- No pinning of the disc to the shaft.
- No radial displacement of the disc due to thermal expansion of the shaft.
- The disc can adapt optimally to the round sealing seat even at extreme temperatures.
- Homogeneous application of the sealing ring also in the shaft area.
- Optimal precondition for **high tightness and functionality.**

QUADAX® IN COMPARISON
LIGHTER AND MORE COMPACT

ADVANTAGES OF THE QUADAX® BUTTERFLY PREMIUM VALVES

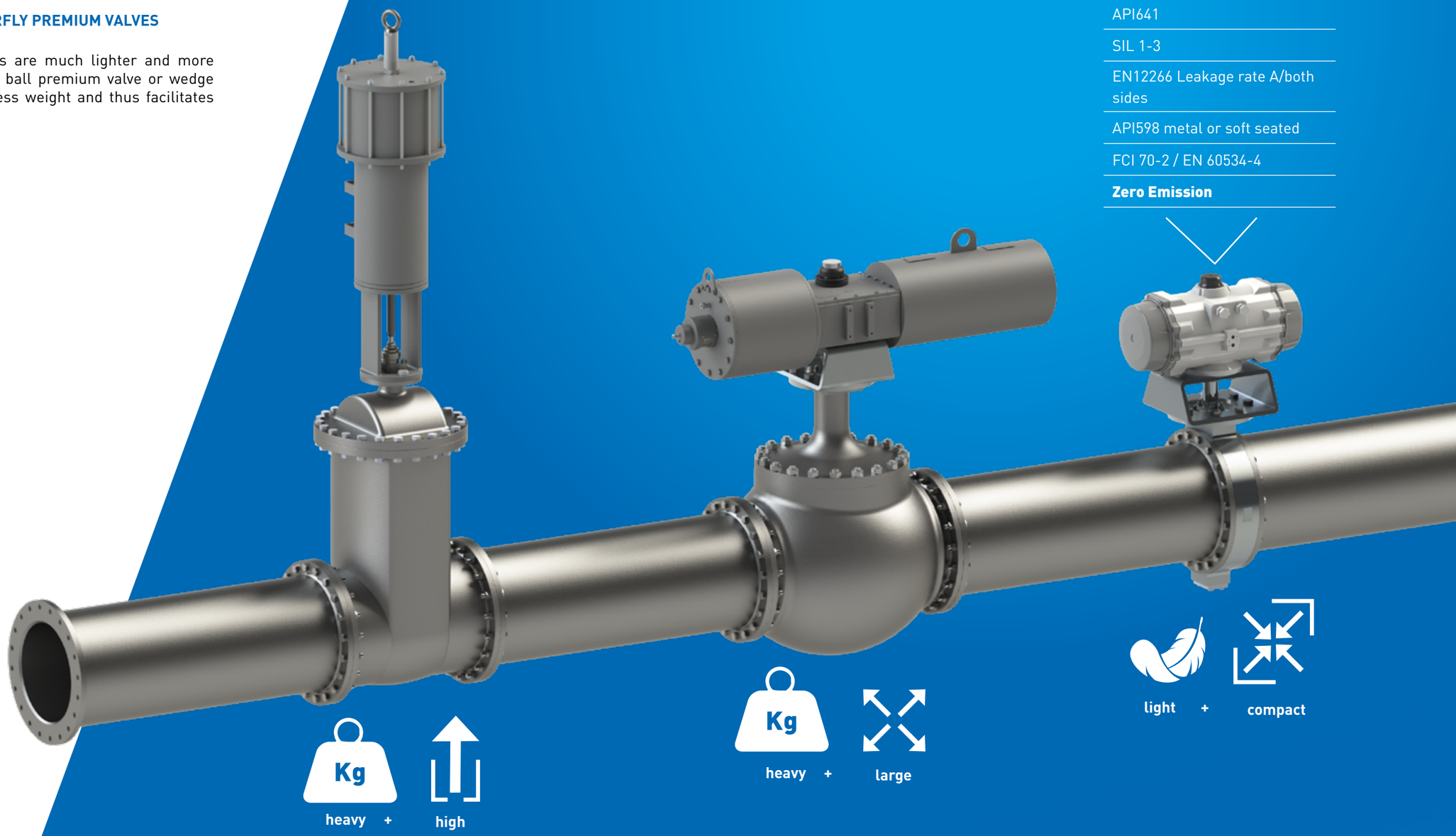
The QUADAX® butterfly premium valves are much lighter and more compact than a classic premium valve, ball premium valve or wedge gate premium valve, which results in less weight and thus facilitates installation in the pipelines.

- Compact design
- Less material
- Low weight
- No friction during opening/closing
- Little wear
- Low-maintenance
- Quick closing possible
- Little clamping inclination
- No dead spaces
- Simple and compact automation

Because regulation and tightness do not have to be contradictory

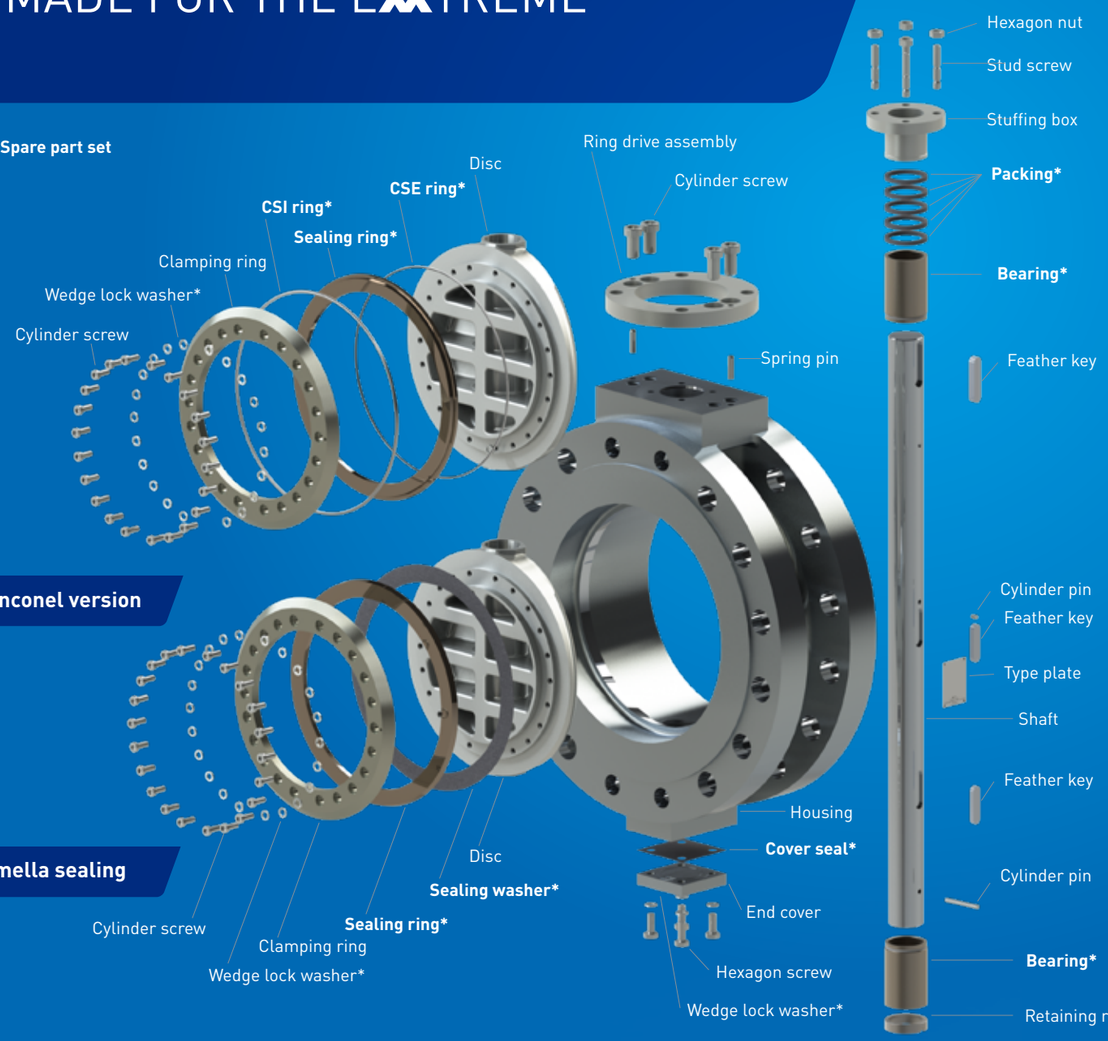
THE OPTIMAL UNIT QUADAX® BUTTERFLY PREMIUM VALVE

- FIRE SAFE API 607 / BS 6755
- 2014/68/EU
- ISO15848-1: 2015 (BH, CO3)
- API641
- SIL 1-3
- EN12266 Leakage rate A/both sides
- API598 metal or soft seated
- FCI 70-2 / EN 60534-4
- **Zero Emission**



QUADAX® VERSIONS
MADE FOR THE EXTREME

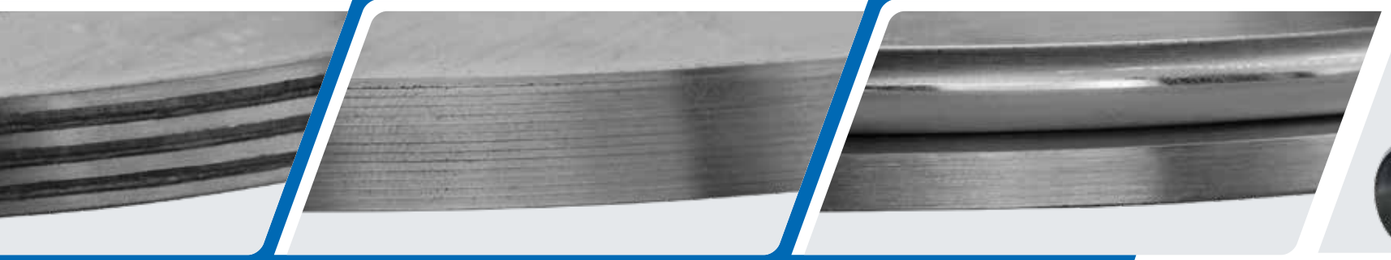
***Spare part set**



for Inconel version

for lamella sealing

SEALING RING OPTIONS:



Graphite lamella

Full stainless steel lamella

Inconel O-ring

OTHER VERSIONS ON REQUEST.

HOUSING SHAPES

01
QUADAX® – DOUBLE FLANGE VERSION

02
QUADAX® – LUG TYPE VERSION

03
QUADAX® – BUTT-WELD VERSION

04
QUADAX® – GATE VALVES REPLACEMENT

05
QUADAX® – TOP ENTRY

YOUR CONTACT

QUADAX®
SCAN FOR THE
EXXTREME

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