









## Fasteners for the chemical industry

Whether it is piping, pressure equipment, heat exchanger, Mixing Technology, columns, washers, appliances, containers or process plants there is hardly any area of the chemical industry that can do without safe fasteners. TS Fasteners has many

years of experience and an understanding of these particular requirements of this industry. In the production of our special alloy fasteners we find that safety, quality and reliability are the basis of our daily work.

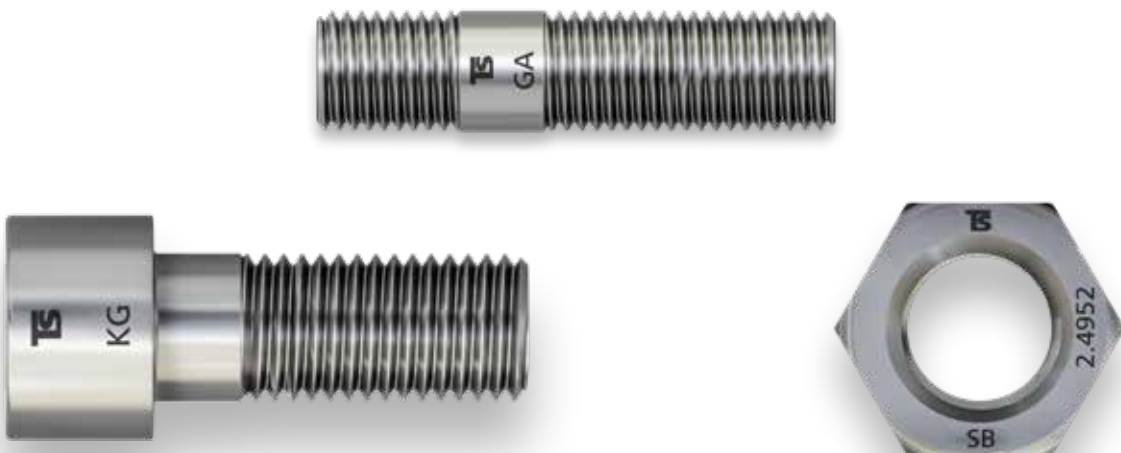
We are listed as accredited manufacturer of screws, nuts and bolts according to VdTÜV-leaflet 1253-1/4 and we supply certified and documented safety with certificates EN 10204/3.1/3.2 according to:

- Pressure equipment directive – DGRL (PED) 2014/68/EU
- AD 2000 Rules W0 / W2 / W7, -W7/1, -W7/2 / W10
- AD 2000 Rules HP100 R
- EN 13445 (Pressure equipment)
- EN 13480 (Metallic Industrial Piping)
- EN 1515 Part 1 til 4 (Flanges and Bolting)
- PAS 1057-10 (Pipe components of non-alloyed and alloyed steel)
- PAS 1057-11 (Pipe components of austenitic stainless steels)
- DIN 21057-10 (Pipe components of non-alloyed and alloyed steel)

- DIN 21057-11 (Pipe components of austenitic stainless steels)
- DIN EN 10269, (Steels and nickel alloys), EN ISO 3506-1/2/3 (Corrosion-resistant stainless steel fasteners)
- All grades according to ASTM/ASME/NACE/API

### TS supports the chemical industry:

- in turnaround management TAR/TA, Shutdowns as well as maintenance, plant maintenance and repair work.
- with more than 300 different materials in stock in more than 5.000 sizes.
- if needed through our TS Express Service.



## TYPISCHE WERKSTOFFE DER CHEMISCHEN INDUSTRIE | TYPICAL MATERIALS FOR THE CHEMICAL INDUSTRY

| Nummer<br>Number   | Name<br>Name             | Werkstoff Norm<br>Material Norm | Einsatztemperatur<br>Temperature | Kurzzeichen<br>Abbreviation |
|--|--------------------------|---------------------------------|----------------------------------|-----------------------------|
| <b>AUSTENISCHE WERKSTOFFE / AUSTENITIC MATERIALS</b>                   |                          |                                 |                                  |                             |
| 1.4301 / AISI 304  | X5CrNi18-10              | DIN EN 10269                    | -200°C bis/to +300°C             |                             |
| 1.4306 / AISI 306  | X2CrNi19-11              | DIN EN 10272                    | -200°C bis/to +350°C             |                             |
| 1.4401 / AISI 316  | X5CrNiMo17-12-2          | DIN EN 10269                    | -60°C bis/to +300°C              |                             |
| 1.4404 / AISI 316L   | X2CrNiMo17-12-2          | DIN EN 10269                    | -60°C bis/to +400°C              |                             |
| 1.4466 / UNS S31050 / 2RE29®   | X1CrNiMoN25-22-2         | DIN EN 10088-3/ASTM A479        | < 400°C                          |                             |
| 1.4529 / Alloy 926   | X1NiCrM-<br>oCuN25-20-7  | DIN EN 10272<br>VdTÜV 502       | -200°C bis/to +400°C             |                             |
| 1.4539 / AISI 904L   | X1NiCrMoCu25-20-5        | DIN EN 10272<br>VdTÜV 421       | -200°C bis/to +400°C             |                             |
| 1.4980 / Alloy 268/660 A/B/C/D   | X6NiCrT-<br>iMoVB25-15-2 | DIN EN 10269<br>VdTÜV 435       | -270°C bis/to +650°C             | SD                          |
| 1.4986 wk  | X7CrNiMoBNb16-16         | DIN EN 10269<br>VdTÜV 113/2     | -10°C bis/to +650°C              | S                           |
| A2-50/70   |                          | EN ISO 3506-1/2/3               | -200°C bis/to +400°C             |                             |
| A3-50/70   |                          | EN ISO 3506-1/2/3               | -200°C bis/to +400°C             |                             |
| A4-50/70/80  |                          | EN ISO 3506-1/2/3               | -60°C (-200°C*) bis/to +400°C    |                             |
| A5-50/70   |                          | EN ISO 3506-1/2/3               | -60°C (-200°C*) bis/to +400°C    |                             |
| * Stiftschrauben / stud bolts  |                          |                                 |                                  |                             |
| <b>FERRITISCHE WERKSTOFFE / FERRITIC MATERIALS</b>                     |                          |                                 |                                  |                             |
| 1.1181   | C35E                     | DIN EN 10269                    | -10°C bis/to +400°C              | YK                          |
| 1.4923   | X22CrMoV12-1             | DIN EN 10269                    | -10°C bis/to +550°C              | V                           |
| 1.5680   | X12Ni5                   | DIN EN 10269                    | -120°C bis/to +300°C             | KB                          |
| 1.7218   | 25CrMo4                  | DIN EN 10269                    | -60°C bis/to +500°C              | KG                          |
| 1.7709   | 21CrMoV5-7               | DIN EN 10269                    | -10°C bis/to +500°C              | GA                          |
| <b>KORROSIONSBESTÄNDIGE WERKSTOFFE / CORROSION RESISTANT MATERIALS</b> |                          |                                 |                                  |                             |
| 1.4562 / UNS N08031  | Alloy 31                 | VdTÜV 509 / ASTM B 581          | -196°C bis/to +550°C             |                             |
| 2.4602 / UNS N06022  | Alloy C22                | VdTÜV 479 / ASTM B 574          | -196°C bis/to +400°C             |                             |
| 2.4605 / UNS N06059  | Alloy 59                 | VdTÜV 505 / ASTM B 574          | -196°C bis/to +450°C             |                             |
| 2.4610 / UNS N06455  | Alloy C 4                | VdTÜV 424 / ASTM B 574          | -196°C bis/to +400°C             |                             |
| 2.4856 / UNS N06625  | Alloy 625                | VdTÜV 499 / ASTM B 466          | -196°C bis/to +450°C             |                             |
| <b>HOCHTEMPERATURLEGIERUNGEN / HIGH TEMPERATURE ALLOYS</b>             |                          |                                 |                                  |                             |
| 1.4876 H / Alloy 800H  | X10NiCrAlTi32-20 H       | VdTÜV 434 / ASTM B 408          | +600°C bis/to +950°C             |                             |
| 1.4876 HT / Alloy 800HT  | X10NiCrAlTi32-20 HT      | VdTÜV 412 / ASTM B 408          | -10°C bis/to +900°C              |                             |
| 2.4633 / UNS N06025  | Alloy 602                | VdTÜV 540 / ASTM B 166          | -10°C bis/to +1.150°C            |                             |
| 2.4816 / UNS N06600  | Alloy 600                | VdTÜV 305 / ASTM B 166          | -10°C bis/to +450°C              |                             |
| 2.4952 / UNS N07080  | NiCr20TiAl               | DIN EN 10269 / ASTM B 637       | -196°C bis/to +650°C             | SB                          |
| <b>TITAN UND TITANLEGIERUNGEN / TITANIUM AND TITANIUM ALLOYS</b>       |                          |                                 |                                  |                             |
| 3.7035 / UNS R50400  | Titan Gr. 2              | ASTM B 348                      | < 350°C                          | Ti 2                        |
| 3.7165 / TiAl6V4 / UNS 56400   | Titan Gr. 5              | ASTM B 348                      | < 400°C                          | Ti 5                        |
| 3.7235 / Ti2Pd / UNS R52400  | Titan Gr. 7              | ASTM B 348                      |                                  | Ti 7                        |
| 3.7105 / UNS R53400  | Titan Gr. 12             | ASTM B 348                      |                                  | Ti 12                       |

Typische Beschichtungen: **Chemische Industrie**

Typical coatings: **Chemical Industry**

**TS** **Verbindungsteile**  
**Fasteners**  
**Special-Fasteners ■ Sonderschrauben**

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| Veredelungsart<br>Coating                         | Norm  |                                 |
|---|---|---------------------------------|
| Feuerverzinkung<br>Hot galvanizing                | EN 10684  |                                 |
| Verzinken<br>Zinc coating                         | DIN EN ISO 4042                                   | Chrom VI frei<br>Chrome VI free |
| Passivierung<br>Passivation                       | Blau/Gelb/Grün/Schwarz<br>blue/yellow/green/black |                                 |
| Dickschichtpassivierung<br>Thick film passivation | DIN 50979   | Chrom VI frei<br>Chrome VI free |
| PTFE  | Xylan®/Xylar®                                     |                                 |
| Zusatzbeschichtung<br>Additional coating          | Top Coat  |                                 |

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