

| Scope according to   |  | <input checked="" type="checkbox"/> Directive 2014/68/EU Annex I §4.3 | <input type="checkbox"/> EN 764-4  | <input checked="" type="checkbox"/> AD 2000-Merkblatt W0  | <input type="checkbox"/> FPC, Regulation (EU) No. 305/2011(System 2+) |                      |   |  |   |   |             |      |
|--|--|---|--|---|---|----------------------|---|--|---|---|-------------|------|
| Manufacturer   |  |   | Work   |   | Nationality   | Date                 | Page No..   |  |   |   |             |      |
| Company Name: TS Verbindungsteile GmbH<br>Dieselstrasse 1<br>Location: D-54634 Bitburg   |  |   | 54634 Bitburg, Dieselstraße 1+5+10<br>99996 Menteroda, Holzthalebenerstr. 30 |   | German  | 16.06.2021<br>Rev.:7 | 1<br>of : 4   | TÜV Rheinland<br>Industrie Service<br>GmbH |   |   |             |      |
| Cur -  | Materials-term<br>Materials-No.  | Material Specification  | Delivery Cond.   | Article Type of Product   | Dimensions  |                      |   |  | Weight max<br><br>1=t / 2=kg<br>↓<br>result | Technical Specifications<br><br>Requirements<br><br>Technical Regulations | Remarks     |      |
|  |  |   |  |   | Thick-ness mm   | Ø mm                 | from  | Up to                                      |   |   |             | from |
| 1  | 2  | 3   | 4  | 5   | 6a  | 6b                   | 7a  | 7b   | 8a  | 8b  | 9           | 10   |
| <b>1. Materials according to harmonized European standards (hEN) and European Approval for Materials (EAM) acc. Directive 2014/68/EU</b>   |  |   |  |   |   |                      |   |  |   |   |             |      |
| <i>The use of the materials according to Directive 2014/68/EU is bound to the publication of Harmonized European Standards or to the qualification by a European material approval or to the particular material appraisal. With that the manufacturing reliability for equivalent material grades according to other standards (e.g. BS, AFNOR, ASME) is proved. The requirements and limits of the applicable code respectively the PED must be observed for the use of material grades listed in column 2 to 4.</i> |  |   |  |   |   |                      |   |  |   |   |             |      |
|  | stainless steel  | EN 10269<br>EN 10272  | AT   | fasteners   |   |                      |   |  |   |   | EN ISO 3506 |      |
|  | carbon steel   | EN 10269<br>EN 10272  | N,QT   | fasteners   |   |                      | 1   | 200  |   |   | EN ISO 898  |      |
|  | Carbon/austenic steel  | EN 10269<br>EN 10272  | AT   | fasteners   |   |                      |   |  |   |   |             |      |
|  | special materials  | EN 10269<br>EN 10272  | AT<br>AH   | fasteners   |   |                      |   |  |   |   |             |      |
| <b>Remarks</b>   | +AT = solution annealed<br>+AR = as rolled<br>+M = thermo mechanical treated<br>+N = normalized or normalizing formed<br>+AH = hardened/aged |   |  | +NT = normalized and tempered<br>+QT = quenched and tempered<br>+S = soft annealed<br>+SR = stress relieved |   |                      | a = PMA for the use in pressure equipment in Directive 2014/68/EU necessary |  |   |   |             |      |



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|--|---------------------------------|---|--|--|---|----------------------|-------------|--|--|---|---------|----|
| Manufacturer   |                                 |   | Work   |  | Nationality   | Date                 | Page No..   |  |  |   |         |    |
| Company Name: TS Verbindungsteile GmbH<br>Dieselstrasse 1<br>Location: D-54634 Bitburg |                                 |   | 54634 Bitburg, Dieselstraße 1+5+10<br>99996 Menteroda, Holzthalebenerstr. 30 |  | German  | 16.06.2021<br>Rev.:7 | 2<br>of : 4 | TÜV Rheinland<br>Industrie Service<br>GmbH |  |   |         |    |
| Cur -  | Materials-term<br>Materials-No. | Material Specification  | Delivery Cond.   | Article Type of Product                                  | Dimensions  |                      |             |  | Weight max<br><br>1=t /<br>2=kg<br>↓<br>result | Technical Specifications<br><br>Requirements<br><br>Technical Regulations | Remarks |    |
|  |                                 |   |  |  | Thick-ness mm   |                      | Ø mm        |  |  |   |         |    |
|  |                                 |   |  |  | from  | Up to                | from        | Up to                                      |  |   |         |    |
| 1  | 2                               | 3   | 4  | 5  | 6a  | 6b                   | 7a          | 7b   | 8a   | 8b  | 9       | 10 |

**2. Materials according to the AD 2000-Code**

The use of the materials according to DGR 2014/68/EU is bound to the publication of Harmonized European Standards or to the qualification by a European material approval or to the particular material appraisal. With that the manufacturing reliability for equivalent material grades according to other standards (e.g. BS, AFNOR, ASME) is proved. The requirements and limits of the applicable code respectively the PED must be observed for the use of material grades listed in column 2 to 4.

|  |                   |                                  |            |           |  |  |   |     |  |  |                          |   |
|--|-------------------|----------------------------------|------------|-----------|--|--|---|-----|--|--|--------------------------|---|
|  | carbon steel      | EN 10269<br>EN 10272             | N, QT      | fasteners |  |  |   |     |  |  | AD2000 W7<br>EN ISO 898  |   |
|  | stainless steel   | EN 10269<br>EN 10272             | AT         | fasteners |  |  | 1 | 200 |  |  | AD2000 W2<br>EN ISO 3506 |   |
|  | carbon/austenitic | EN 10269<br>EN 10272             | AT         | fasteners |  |  |   |     |  |  | AD2000 W2                |   |
|  | special materials | VdTÜV WB<br>EN 10269<br>EN 10272 | AT,S<br>AH | fasteners |  |  |   |     |  |  | AD2000 W2                | basic material according to requirements of VdTÜV |

|                |                                       |                               |   |
|----------------|---------------------------------------|-------------------------------|---|
| <b>Remarks</b> | +AT = solution annealed               | +NT = normalized and tempered | a = PMA for the use in pressure equipment in Directive 2014/68/EU necessary |
|                | +AR = as rolled                       | +QT = quenched and tempered   |   |
|                | +M = thermo mechanical treated        | +S = soft annealed            |   |
|                | +N = normalized or normalizing formed | +SR = stress relieved         |   |
|                | +AH = hardened/aged                   |                               |   |



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|---|--|---|-----------------------------------|---|--|------|---|-------------|---|---|--|------|
| Manufacturer  |  |   |                                   | Work  |  |      |   | Nationality | Date                                      | Page No..   |  |      |
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| Cur   | Materials-term<br>Materials-No.  | Material Specification  | Delivery Cond.                    | Article Type of Product   | Dimensions   |      |   |             | Weight max<br><br>1=t / 2=kg<br>↓ res ult | Technical Specifications<br><br>Requirements<br><br>Technical Regulations | Remarks                                    |      |
|   |  |   |                                   |   | Thick-ness mm  | Ø mm | from  | Up to       |   |   |  | from |
| 1   | 2  | 3   | 4                                 | 5   | 6a   | 6b   | 7a  | 7b          | 8a  | 8b  | 9  | 10   |
| <b>3. Materials according to international standards ( e. g. ASTM, ASME, IBR etc. )</b>   |  |   |                                   |   |  |      |   |             |   |   |  |      |
| The use of the materials according to DGR 2014/68/EU is bound to the publication of Harmonized European Standards or to the qualification by a European material approval or to the particular material appraisal. With that the manufacturing reliability for equivalent material grades according to other standards (e.g. BS, AFNOR, ASME) is proved. The requirements and limits of the applicable code respectively the PED must be observed for the use of material grades listed in column 2 to 4. |  |   |                                   |   |  |      |   |             |   |   |  |      |
|   | carbon/stainless steel   | ASTM A193/<br>ASME SA193  | AT,N,QT                           | bolts   |  |      |   |             |   |   | ASTM A193/<br>ASME SA193                   | a    |
|   | carbon/stainless steel   | ASTM A194/<br>ASME SA194  | AT,N,QT                           | nuts  |  |      |   |             |   |   | ASTM A194/<br>ASME SA194                   | a    |
|   | stainless steel  | ASTM A276/<br>ASME SA276  | AT                                | fasteners   |  |      |   |             |   |   | ASTM A276/<br>ASME SA276                   | a    |
|   | stainless steel  | ASTM A479/<br>ASME SA479  | AT                                | fasteners   |  |      | 1   | 200         |   |   | ASTM A479/<br>ASME SA479                   | a    |
|   | nickel and nickel alloys   | ASTM B637/<br>ASME SB637  | AT,AH                             | fasteners   |  |      |   |             |   |   | ASTM B637/<br>ASME SB637                   | a    |
|   | titanium and titanium alloys   | ASTM B348/<br>ASME SB348  | S                                 | fasteners   |  |      |   |             |   |   | ASTM B348/<br>ASME SB348                   | a    |
|   | special materials<br>duplex/superduplex  | ASTM A479/<br>ASME SA479  | AT                                | fasteners   |  |      |   |             |   |   | ASTM A479/<br>ASME SA479                   | a    |
|   | carbon steel   | ASTM A320/<br>ASME SA320  | N,QT                              | fasteners   |  |      |   |             |   |   | ASTM A320/<br>ASME SA320                   |      |
| <b>Results</b>  | +AT = solution annealed<br>+AR = as rolled<br>+M = thermo mechanical treated<br>+N = normalized or normalizing formed<br>+AH = hardened/aged |   |                                   | +NT = normalized and tempered<br>+QT = quenched and tempered<br>+S = soft annealed<br>+SR = stress relieved |  |      | a = PMA for the use in pressure equipment in Directive 2014/68/EU necessary |             |   |   |  |      |



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| Cur   | Materials-term<br>Materials-No.  | Material Specification  | Delivery Cond.                    | Article Type of Product   | Dimensions   |         |   |             | Weight max<br><br>1=t /<br>2=kg<br>↓<br>res<br>ult | Technical Specifications<br><br>Requirements<br><br>Technical Regulations | Remarks                                    |      |
|   |  |   |                                   |   | Thick-ness<br>mm   | Ø<br>mm | from  | Up to       |  |   |  | from |
| 1   | 2  | 3   | 4                                 | 5   | 6a   | 6b      | 7a  | 7b          | 8a   | 8b  | 9  | 10   |
| <b>3. Materials according to international standards ( e. g. ASTM, ASME, IBR etc. )</b>   |  |   |                                   |   |  |         |   |             |  |   |  |      |
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|   | carbon steel   | ASTM F467   | N,QT                              | nuts  |  |         |   |             |  |   | ASTM F467                                  | a    |
|   | carbon steel   | ASTM F468   | N,QT                              | bolts   |  |         |   |             |  |   | ASTM F468                                  | a    |
|   | stainless steel  | ASTM F593   | AT                                | bolts   |  |         |   |             |  |   | ASTM F593                                  | a    |
|   | stainless steel  | ASTM F594   | AT                                | nuts  |  |         | 1   | 200         |  |   | ASTM F594                                  | a    |
|   | stainless steel  | ASTM B408/<br>ASME SB408  | AT                                | fasteners   |  |         |   |             |  |   | ASTM B408/<br>ASME SB408                   |      |
|   | stainless steel  | ASTM A453/<br>ASME SA453  | AT                                | fasteners   |  |         |   |             |  |   | ASTM A453/<br>ASME SA453                   | a    |
|   | nickel and nickel alloys   | ASTM B446/<br>ASME SB446  | S,AT,AH                           | fasteners   |  |         |   |             |  |   | ASTM B446/<br>ASME SB446                   | a    |
| <b>Results</b>  | +AT = solution annealed<br>+AR = as rolled<br>+M = thermo mechanical treated<br>+N = normalized or normalizing formed<br>+AH = hardened/aged |   |                                   | +NT = normalized and tempered<br>+QT = quenched and tempered<br>+S = soft annealed<br>+SR = stress relieved |  |         | a = PMA for the use in pressure equipment in Directive 2014/68/EU necessary |             |  |   |  |      |