

Manufacturing Instructions

Manufacturing Instructions

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2. Scope of application

The Manufacturing Instructions described here are binding for all sites of Onejoon GmbH (hereinafter referred to as the 'principal') and all contractors, unless otherwise agreed.

3. Purpose of the Manufacturing Instructions

The instructions contained in these Manufacturing Instructions are to be followed for all planning and execution phases. They have been elaborated in accordance with the principal's technical requirements and are binding for the execution of work.

These instructions cover the minimum standard that must be adhered to without fail. Deviations from the minimum standard must be approved in writing by the principal's respective specialist department before work starts.

In addition, such work must be done in accordance with established engineering practice, the technological state of the art and in compliance with the applicable laws, standards and regulations.

The contractor remains solely responsible to the principal for adherence to these Manufacturing Instructions.

4. Interpretation in cases of contradictory content

Should contradictions arise within the scope of the technical documents, the contractor is obliged to inform the principal immediately and obtain instructions or find a joint solution.

5. Contractual priorities

The interrelationships with and ranking of these Manufacturing Instructions with respect to other agreements concluded between the principal and the contractor are to be dealt with elsewhere, generally in a framework contract and/or in minutes of negotiations and/or in the General Purchasing Conditions.

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6. Packaging / transport

The packaging provides protection against damage or other impairments that could affect the quality of the packaged goods.

Based on the properties of the packaged goods (fragility, size, weight, etc.), all factors along the chain (packing - transport - storage - unpacking - and, if necessary, the delivery chain up to the customer) must be taken into account with respect to the load on the packaging and the packaged goods.

The legal requirements of the supplying and receiving countries regarding packaging must be observed when selecting the methods, means and materials of packaging.

7. Packaging directive.

I. Packaging for export (container goods)

1. The packaging wood must be heat-treated and stamped according to the IPPC standard (plywood and pressboard are not subject to quarantine regulations)
2. The goods must be placed on a pallet. It must be possible to push the pallet into the truck/container with a forklift and the pallet must be larger than the goods on all sides.
3. Bare components must be protected against corrosion with "Metacoron 850" or "Cortec VCI 369".
4. Open piping and pipe sockets must be closed off at the ends.
5. The goods (except stainless steel) should be packed in VCI film (corrosion protection film) in a fully enclosed and airtight manner.
6. The desiccant "Container-DRI" should be packed along with the goods in VCI film (1 bag/m³).
7. The goods must be lashed to the pallet with sufficiently wide (at least 25 mm) polyester straps.
8. A PE foil hood must be placed over the packaging unit and glued in place.
9. Handling symbols (e.g. chain, forklift, centre of gravity symbols etc.) must be attached according to DIN 55402.
10. Labels or adhesive tapes should not be stuck to visible surfaces, as the removal of adhesive residues requires considerable effort.

II. Packaging for air cargo

1. The goods must always be packed in tamper-proof and stackable boxes or cartons. Packaging for other purposes: see Packaging for export (1; 3-7; 9+10)

III. Packaging for transport by truck within Germany and neighbouring countries

1. The pallet must be larger than the goods on all sides.
2. The goods must be lashed to the pallet with sufficiently wide (at least 25 mm) polyester straps.
3. Bare components must be protected against corrosion with "Metacoron 850" or "Cortec VCI 369".
4. Open piping and pipe sockets must be closed off at the ends.
5. A PE foil hood must be placed over the packaging unit and glued in place.
6. Handling symbols (e.g. chain, forklift, centre of gravity symbols etc.) must be attached according to DIN 55402.

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7. Labels or adhesive tapes should not be stuck to visible surfaces, as the removal of adhesive residues requires considerable effort.

The mentioned packaging materials are available from the respective companies:

VCI film/ LDPE shrink film:	DundD Industrieverpackungen, +49 9621 78863 0 Rebel Kunststoffe GmbH, +49 551 9911-0
Desiccant and tensioning straps	Transpak GmbH, +49 5543 3035 0
Corrosion protection:	Reiff Technische Produkte GmbH, +49 7121 323 0

All suppliers are responsible for the safe packaging of their goods.

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11. Edge condition

Applicable standard

- DIN EN ISO 13715 Technical product documentation - Edges of undefined shape - Indication and dimensioning

12. Thread

Applicable standard

- DIN 202 Screw threads (General plan)
- DIN ISO 965-1 ISO general purpose metric screw threads - Tolerances - Part 2: Limits of sizes for general purpose external and internal screw threads; medium quality
- DIN ISO 965-2 ISO general purpose metric screw threads - Tolerances - Part 2: Limits of sizes for general purpose external and internal screw threads; medium quality

13. Holes / Countersinks

Applicable standard

- DIN EN 20273 Clearance holes for bolts and screws
- DIN EN ISO 15065 Countersinks for countersunk head screws with head configuration in accordance with ISO7721
- DIN 74 Countersinks for countersunk head screws except countersunk head screws with heads according to DIN EN 27721
- DIN 974-1 Diameters of counterbores – Manufacturing dimensions – Part 1: Hexagon socket head cap screws and screws with cheese head or pan head
- DIN 974-2 Diameter of counterbores for hexagon bolts, screws and nuts; manufacturing dimensions

14. Welding / Soldering

Applicable standard

- DIN EN ISO 2553 Welding and allied processes - Symbolic representation on drawings - Welded joints (ISO 2553:2019, Corrected version 2021-09); German version EN ISO 2553:2019
- DIN EN 1011-1 Welding – Recommendations for welding of metallic materials –Part 1: General guidance for arc welding; German version of EN 1011-1:2009
- DIN EN 1011-2 Welding – Recommendations for welding of metallic materials –Part 2: Arc welding of ferritic steels; German version EN 1011-2:2001
- DIN EN 1011-3 Welding - Recommendations for welding of metallic materials - Part 3: Arc welding of stainless steels; German version EN 1011-3:2018
- DIN EN 1011-4 Welding – Recommendations for welding of metallic materials –Part 4: Arc welding of aluminum and aluminum alloys; German version EN 1011-4:2000

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15. Welding requirements steel construction

General

In the event of conflicting requirements in the principal's orders, statutory regulations or technical rules, the more stringent quality requirements shall always apply. In case of doubt, consult with the customer!

Technical representation on drawings

Symbols and dimensions shall be provided according to:

- DIN EN ISO 2553 Welding and allied processes - Symbolic representation on drawings - Welded joints (ISO 2553:2019, Corrected version 2021-09); German version EN ISO 2553:2019

Welding seams shall be prepared as per DIN EN 1090-2 according to:

- DIN EN ISO 9692 Welding and allied processes – Types of joint preparation – Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels (ISO 9692-1:2013); German version EN ISO 9692-1:2013

The quality levels applying to the construction are to be indicated on the drawings according to DIN EN 1090-2.

The following applies:

- DIN EN ISO 5817 Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2023); German version EN ISO 5817:2023

Tolerances for welded constructions are to be indicated according to DIN EN 1090-2.

The following applies:

- DIN EN 13920 General tolerances for welded constructions – Dimensions for lengths and angles - Shape and position (ISO 13920:1996); German version EN ISO 13920:1996

Please pay attention to the note concerning the exception and to the following table in chapter 9!

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16. Welding requirements for piping of stainless austenitic steels

General requirements

Translations of welding-related specialist terms as well as calculation, manufacture, design and inspection of all pipework are to be carried out according to standards.

Applicable standards

- DIN EN 1792 Welding - Multilingual list of terms for welding and related processes – Trilingual version EN 1792:2003
- AD 2000 information sheet HP 100 R Construction regulations – Pipes made of metallic materials
- DIN EN 13480-1 to DIN EN 13480-8 Metallic industrial piping

Requirements for the manufacturer / supplier

Certification as per AD/HP 0 or Pressure Equipment Directive and/or the respective welding procedure tests.

Applicable standard

- DIN EN ISO 15614-1 Specification and qualification of welding procedures for metallic materials – Welding procedure test. Part 1: Arc welding of nickel and nickel alloys

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Welding requirements for piping of stainless austenitic steels

Quality assurance for welding work

For quality assurance in welding work, the following quality requirements are to be observed:

Applicable standard

- DIN EN ISO 3834-2 Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2:2021); German version EN ISO 3834-2:2021

corresponding with the following chapters:

- 5. Review of the requirements and technical review
- 6. Subcontracting
- 7. Welding personnel
- 8. Monitoring and testing personnel
- 9. Equipment
- 10. Welding-related and associated activities
- 11. Filler metals
- 12. Storage of parent metals
- 13. Post-weld heat treatment
- 14. Monitoring and testing
- 15. Nonconformity and corrective actions
- 16. Calibration and validation of measuring, monitoring and testing equipment
- 17. Identification and traceability
- 18. Quality reports

Quality of welding joints

The welding joint quality is to be specified by the designer and entered into the drawings.

Applicable standard

- AD 2000 information sheet HP 100 R Construction regulations – Pipes made of metallic materials
- DIN EN 13480-1 to DIN EN 13480-8 Metallic industrial piping

If nothing has been laid down or specified, quality level 'C' applies.

Applicable standard

- DIN EN ISO 5817 Welding – Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) – Quality levels for imperfections (ISO 5817:2014); German version EN ISO 5817:2014

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Welding requirements for piping of stainless austenitic steels

Requirements for the base material

Basic material inspection documents 3.1 according to DIN EN 10204 Metallic products - Types of inspection documents; German version EN 10204:2004

Requirements for the filler metal

- Use equivalent or higher alloyed filler metals
- TÜV approval
- Material certificate 2.2 according to DIN EN 10204.
- Welding without filler metal only permitted with approval from the Onejoon GmbH.
- Molybdenum higher alloyed filler metals are to be used for molybdenum alloyed steels!

Tests and scope of inspections

are generally to be determined together with the customer and laid down in writing in accordance with the following standards prior to signing the contract!

- AD 2000 information sheet HP 100 R Construction regulations – Pipes made of metallic materials
- DIN EN 13480-1 to DIN EN 13480-8 Metallic industrial piping
- Checking pipelines for leaks

The testing personnel must be qualified and certified.

- DIN EN ISO 9712 Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712:2021); German version EN ISO 9712:2022
- DIN EN ISO 9712 Supplement Nondestructive testing – Qualification and certification of NDT personnel; Supplement 1: Recommendations on the application of DIN EN ISO 9712:2012-12

Test types:

If testing is to be non-destructive, then the following standards are to be applied, or other standards according to the requirements associated with the component:

- General rules according to DIN EN ISO 17635
- Visual testing (VT) DIN EN ISO 17637
- Radiographic testing (RT) DIN EN ISO 17636
- Surface check by the dye penetration method (PT) DIN EN ISO 3452
- Ultrasonic testing (UT) DIN EN ISO 17640
- Magnetic particle testing (MT) DIN EN ISO 17638
- Leakage test by the bubble method, with the vacuum chamber, with leak detection spray DIN EN 1779
- Leakage test with excess pressure, with leak detection spray or differential pressure measurement DIN EN 1779

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Welding requirements for piping of stainless austenitic steels

Processing of stainless steels

With the exception of electropolishing, the following applies to processing and reworking:

- DIN EN 1011-3 Welding - Recommendations for welding of metallic materials - Part 3: Arc welding of stainless steels; German version EN 1011-3:2018

The surfaces of austenitic stainless steels must be free of tempering colors and passivated.

Inspections

The contractor must assure the principal or the principal's representative that inspection of the parts to be manufactured is possible at any time.

General

In the event of conflicting requirements in the principal's orders, statutory regulations or technical rules, the more stringent quality requirement shall always apply. In case of doubt, please contact the person who released the order beforehand!

Technical representation on drawings

Symbols and dimensions shall be provided according to:

- DIN EN ISO 2553 Welding and allied processes - Symbolic representation on drawings - Welded joints (ISO 2553:2019, Corrected version 2021-09); German version EN ISO 2553:2019

Welding seam preparation is to be according to:

- DIN EN ISO 9692-1 Welding and allied processes - Types of joint preparation - Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels (ISO 9692-1:2013); German version EN ISO 9692-1:2013

The form of the welded joint is to be in accordance with:

- DIN EN 1708-01 Welding – Basic welded joint details in steel – Part 1: Pressurized components; German version EN 1708-1:2010

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17. Welding-related requirements for plant pipelines and containers of austenitic stainless steel (Germany) according to the Wasserhaushaltsgesetz (Federal Water Act, WHG)

General requirements

- Translations of welding-related specialist terms are to be carried out according to the prescribed standard.
- Calculation, manufacture, design and inspection of all pipework and containers are to be carried out according to standard.
- Regulations for plant governing the handling of water-hazardous substances (VawS) and on specialist companies are to be adhered to and to be examined.
- Administrative provisions on the execution of the VawS (VV-VawS) are to be observed.
- Construction and manufacturing shall be carried out according to TRbF (Technische Regeln brennbarer Flüssigkeiten – Technical Regulations on Flammable Liquids) and the standards and regulations stipulated therein.
- The requirements of the Building Rules Lists must be observed.

Applicable standard

- DIN EN 1792 Welding - Multilingual list of terms for welding and related processes – Trilingual version EN 1792:2003

Requirements for the manufacturer / supplier

Existence of recognition as a specialist company according to the Federal Water Act with monitoring contract including welding technology and recognized welding techniques (welding procedure tests)

Applicable standard

- DIN EN ISO 15614-1 Specification and qualification of welding procedures for metallic materials – Welding procedure test. Part 1, Arc welding of nickel and nickel alloys

Manufacturing Instructions

Welding-related requirements for plant pipelines and containers of austenitic stainless steel (Germany) according to the Wasserhaushaltsgesetz (Federal Water Act, WHG)

Quality assurance for welding work

For quality assurance in welding work, the following quality requirements are to be observed:

- DIN EN ISO 3834-2 Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2:2021); German version EN ISO 3834-2:2021

corresponding with the following chapters:

- 5. Review of the requirements and technical review
- 6. Subcontracting
- 7. Welding personnel
- 8. Monitoring and testing personnel
- 9. Equipment
- 10. Welding-related and associated activities
- 11. Filler metals
- 12. Storage of parent metals
- 13. Post-weld heat treatment
- 14. Monitoring and testing
- 15. Nonconformity and corrective actions
- 16. Calibration and validation of measuring, monitoring and testing equipment
- 17. Identification and traceability
- 18. Quality reports

Quality of welding joints

The welding joint qualities are to be specified by the designer and entered into the drawings.

Applicable standard

- AD 2000 information sheet HP5/3 Manufacturing and testing of pressure tanks – making and testing the joints – non-destructive testing of the welded joints

Requirements for the base material

Basic material inspection documents 3.1 according to DIN EN 10204 Metallic products - Types of inspection documents; German version EN 10204:2004

Proof of IC (intercrystalline corrosion) resistance for corrosion-resisting materials.

Requirements for the filler metal

- Use equivalent or higher alloyed filler metals
- TÜV or DB approval
- Material certificate 2.2 according to DIN EN 10204.
- Welding without filler metal only permitted with approval from the Onejoon GmbH.

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Welding-related requirements for plant pipelines and containers of austenitic stainless steel (Germany) according to the Wasserhaushaltsgesetz (Federal Water Act, WHG)

Tests and scope of inspections

As per AD/HP 5/3 and the regulations laid down therein and/or contractual provisions. However, all pipes at least 2% of the weld seam lengths irrespective of material and diameter.

The testing personnel must be qualified and certified.

- DIN EN ISO 9712 Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712:2021); German version EN ISO 9712:2022
- DIN EN ISO 9712 Supplement **Nondestructive testing – Qualification and certification of NDT personnel; Supplement 1: Recommendations on the application of DIN EN ISO 9712:2012-12**

Test types:

If testing is to be non-destructive, then the following standards are to be applied, or other standards according to the requirements associated with the component:

- General rules according to DIN EN ISO 17635
- Visual testing (VT) DIN EN ISO 17637
- Radiographic testing (RT) DIN EN ISO 17636
- Surface check by the dye penetration method (PT) DIN EN ISO 3452
- Ultrasonic testing (UT) DIN EN ISO 17640
- Magnetic particle testing (MT) DIN EN ISO 17638
- Leakage test by the bubble method, with the vacuum chamber, with leak detection spray DIN EN 1779
- Leakage test with excess pressure, with leak detection spray or differential pressure measurement DIN EN 1779

Processing of stainless steels

With the exception of electropolishing, the following applies to processing and reworking:

- DIN EN 1011-3 Welding - Recommendations for welding of metallic materials - Part 3: Arc welding of stainless steels; German version EN 1011-3:2018

The surfaces of austenitic stainless steels must be free of tempering colors and passivated.

Manufacturing Instructions

Welding-related requirements for plant pipelines and containers of austenitic stainless steel (Germany) according to the Wasserhaushaltsgesetz (Federal Water Act, WHG)

Inspections

The contractor must assure the principal or the principal's representative that inspection of the parts to be manufactured is possible at any time.

General

In the event of conflicting requirements in the principal's orders, statutory regulations or technical rules, the more stringent quality requirement shall always apply. In case of doubt, please contact the person who released the order beforehand!

Technical representation on drawings

Symbols and dimensions shall be provided according to:

- DIN EN ISO 2553 Welding and allied processes - Symbolic representation on drawings - Welded joints (ISO 2553:2019, Corrected version 2021-09); German version EN ISO 2553:2019

Welding seam preparation is to be according to:

- DIN EN ISO 9692-1 Welding and allied processes – Types of joint preparation – Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels (ISO 9692-1:2013); German version EN ISO 9692-1:2013

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18. Welding-related requirements for piping and containers for deionized water plant

General requirements

- Translations of welding-related specialist terms are to be carried out according to the prescribed standard.
- Calculation, manufacture, design and inspection of all pipework and containers are to be carried out according to standard.
- Regulations for plant governing the handling of water-hazardous substances (VawS) and on specialist companies are to be adhered to and to be examined.
- Administrative provisions on the execution of the VawS (VV-VawS) are to be observed.
- For containers under internal or external pressure, the AD regulations apply.

Applicable standard

- DIN EN 1792 Welding - Multilingual list of terms for welding and related processes – Trilingual version EN 1792:2003

Requirements for the manufacturer / supplier

Existence of recognition as a specialist company according to the Federal Water Act with monitoring contract including welding technology and recognized welding techniques (welding procedure tests)

Applicable standard

- DIN EN ISO 15614-1 Specification and qualification of welding procedures for metallic materials – Welding procedure test. Part 1: Arc welding of nickel and nickel alloys

Manufacturing Instructions

Welding-related requirements for piping and containers for deionized water plant

Quality assurance for welding work

For quality assurance in welding work, the following quality requirements are to be observed:

- DIN EN ISO 3834-2 Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2:2021); German version EN ISO 3834-2:2021

corresponding with the following chapters:

- 5. Review of the requirements and technical review
- 6. Subcontracting
- 7. Welding personnel
- 8. Monitoring and testing personnel
- 9. Equipment
- 10. Welding-related and associated activities
- 11. Filler metals
- 12. Storage of parent metals
- 13. Post-weld heat treatment
- 14. Monitoring and testing
- 15. Nonconformity and corrective actions
- 16. Calibration and validation of measuring, monitoring and testing equipment
- 17. Identification and traceability
- 18. Quality reports

Quality of welding joints

The welding joint qualities are to be specified by the designer and entered into the drawings.

Applicable standard

- DIN EN ISO 5817 Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2023); German version EN ISO 5817:2023

Generally, quality level 'C' applies for welding seams in corrosion-resistant materials as per

- DVS (German Welding Association) information sheet 0705 Recommendations for quality level assignment acc. to DIN EN ISO 5817:2006-10 and the preceding standard DIN EN 25817:1992-09

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Welding-related requirements for piping and containers for deionized water plant

Requirements for the base material

Basic material inspection documents 3.1 according to DIN EN 10204 Metallic products - Types of inspection documents; German version EN10204:2004

Requirements for the filler metal

- Use equivalent or higher alloyed filler metals
- TÜV or DB approval
- Welding without filler metal only permitted with approval from the Onejoon GmbH.

Tests and scope of inspections

shall generally be determined together with the customer and taken down in writing prior to signing the contract!

This procedure is to be based on the following standards:

- AD 2000 information sheet HP 5/3 Manufacturing and testing of pressure tanks – making and testing the joints – non-destructive testing of the welded joints
- AD 2000 information sheet HP 100 R Construction regulations – Pipes made of metallic materials

Test types:

If testing is to be non-destructive, then the following standards are to be applied, or other standards according to the requirements associated with the component:

- General rules according to DIN EN ISO 17635
- Visual testing (VT) DIN EN ISO 17637
- Radiographic testing (RT) DIN EN ISO 17636
- Surface check by the dye penetration method (PT) DIN EN ISO 3452
- Ultrasonic testing (UT) DIN EN ISO 17640
- Magnetic particle testing (MT) DIN EN ISO 17638
- Leakage test by the bubble method, with the vacuum chamber, with leak detection spray DIN EN 1779
- Leakage test with excess pressure, with leak detection spray or differential pressure measurement DIN EN 1779

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Welding-related requirements for piping and containers for deionized water plant

Processing of stainless steels

- Processing carried out according to DIN EN 1011 part 3.
- With the exception of electropolishing, the recommendations contained in DIN EN 1011 P3 apply to reworking:
- The interior and exterior surfaces of plant made of stainless, austenitic steels must be free of temper colors and passivated.

Inspections

The contractor must assure the principal or the principal's representative that inspection of the parts to be manufactured is possible at any time.

General

In the event of conflicting requirements in the principal's orders, statutory regulations or technical rules, the more stringent quality requirement shall always apply. In case of doubt, please contact the person who released the order beforehand!

Technical representation on drawings

Symbols and dimensions shall be provided according to:

- DIN EN ISO 2553 Welding and allied processes – Symbolic representation on drawings – Welded joints (ISO 2553:2013); German version EN ISO 2553:2013
- DIN EN 1708-1 Welding – Basic welded joint details in steel welding. Part 1: Pressurized components; German version EN 1708-1:2010

Drawings are to be checked regarding welding aspects!

Welding seam preparation is to be according to:

- DIN EN ISO 9692 Welding and allied processes – Types of joint preparation – Part 1: Manual metal-arc welding, gas-shielded metal-arc welding, gas welding, TIG welding and beam welding of steels (ISO 9692-1:2013); German version EN ISO 9692-1:2013

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19. Welding requirements **Selection of ancillary material**

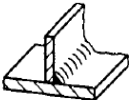









When selecting the filler materials and welding requirements, the manufacturers' specifications in the data sheets must be strictly adhered to.

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20. Welding seams, symbolic representation

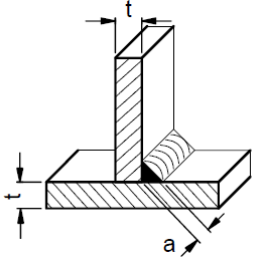
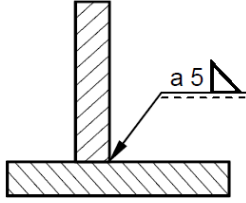
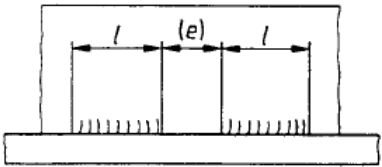
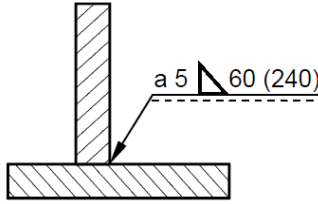
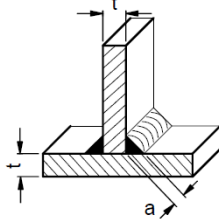
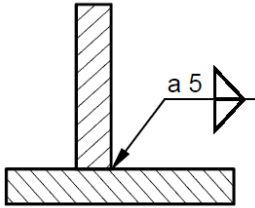
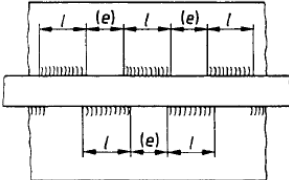
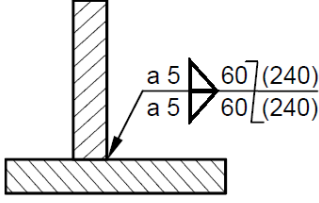
Extract from DIN EN ISO 22 553 System A

Basic symbols

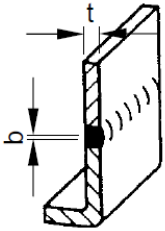
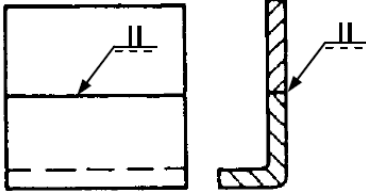
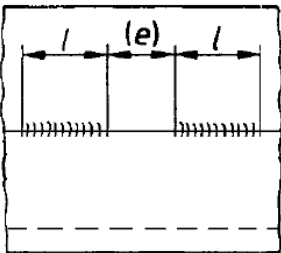
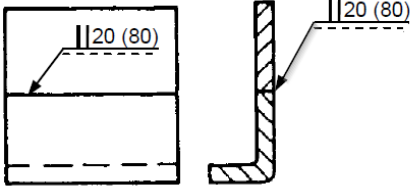
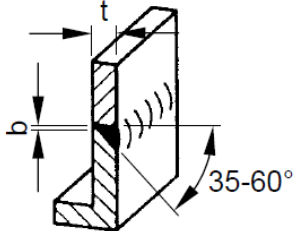
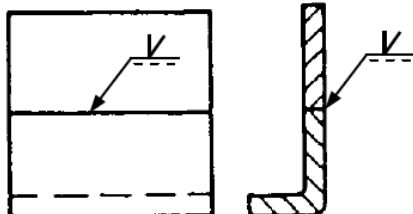
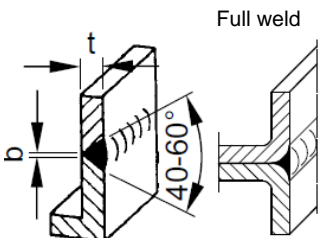
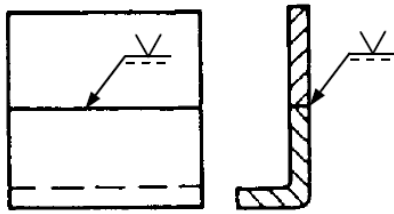
Fillet weld			Square groove weld			Single-bevel groove weld		
Single-Vee groove weld			Spot weld					

Manufacturing Instructions

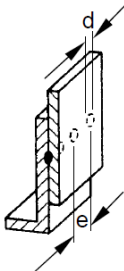
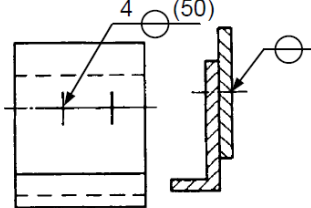
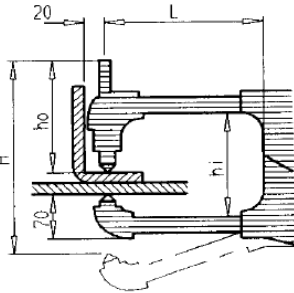
Display

as image	Drawings as per DIN EN ISO 22553 System A	Construction note
<p>Continuous fillet weld</p> 	 <p>for seam thickness $a = 5$</p>	<p>Reference values for fillet weld dimensions</p> <p>Seam thickness a for $*t \leq 2 \text{ mm}$ $a = 2$ $*t = 3 - 5 \text{ mm}$ $a = 3$ $*t = 6 - 10 \text{ mm}$ $a = 5$ $*t = 12 - 15 \text{ mm}$ $a = 7$</p> <p>For interrupted seam: Seam length l $l = 10 \times *t$ Seam spacing (e) $t \leq 6 \text{ mm}$ $e = 40 \times *t$ $t \geq 8 \text{ mm}$ $e = 20 \times *t$</p> <p>* for differing sheet thicknesses t min. applies in each case</p>
<p>Interrupted fillet weld</p> 	 <p>for seam thickness $a = 5$; $l = 60$; seam spacing $(e) = 240$</p>	
<p>Continuous double fillet weld</p> 	 <p>for seam thickness $a = 5$</p>	
<p>Interrupted double fillet weld, offset</p> 	 <p>for seam thickness $a = 5$; $l = 60$; seam spacing $(e) = 240$</p>	

Manufacturing Instructions

as image	Drawings as per DIN EN ISO 22553 System A	Construction note										
<p>I - Continuous weld</p>  <p>for sheet $t \leq 6$ mm</p>		<p>Reference values for butt weld dimensions</p> <p>For interrupted seam: Seam length l $l = 10 \times t$ Seam spacing (e) $t \leq 6$ mm $e = 40 \times t$ $t \geq 8$ mm $e = 20 \times t$</p>										
<p>I - interrupted seam</p> 	 <p>for seam thickness $l = 20$; seam spacing (e) = 80</p>	<p>* for differing sheet thicknesses t min. applies in each case</p> <p>Welding gap b for manufacturing plates:</p> <table border="0"> <tr> <td>welding machine</td> <td>$b = 0$</td> </tr> <tr> <td>manual $t \leq 3$</td> <td>$b = 0$</td> </tr> <tr> <td>$t > 3$</td> <td>$b = 2$</td> </tr> </table>	welding machine	$b = 0$	manual $t \leq 3$	$b = 0$	$t > 3$	$b = 2$				
welding machine	$b = 0$											
manual $t \leq 3$	$b = 0$											
$t > 3$	$b = 2$											
<p>HV - continuous seam</p>  <p>for sheet $t = 8 - 10$ mm</p>		<p>for pipes</p> <table border="0"> <tr> <td>steel</td> <td>$b = 0$</td> </tr> <tr> <td>stainless steel</td> <td>$b = 0$</td> </tr> <tr> <td>forming gas</td> <td>$b = 0$</td> </tr> <tr> <td>stainless steel</td> <td>$b = 0$</td> </tr> <tr> <td>remainder</td> <td>$b = 1$</td> </tr> </table>	steel	$b = 0$	stainless steel	$b = 0$	forming gas	$b = 0$	stainless steel	$b = 0$	remainder	$b = 1$
steel	$b = 0$											
stainless steel	$b = 0$											
forming gas	$b = 0$											
stainless steel	$b = 0$											
remainder	$b = 1$											
<p>continuous V seam</p>  <p>for sheet $t \geq 12$ mm</p>												

Manufacturing Instructions

as image	Drawings as per DIN EN ISO 22553 System A	Construction note																				
spot weld 	 <p>for spot weld diameter $d = 4$; spot weld spacing $(e) = 50$</p>	<p>Reference values for spot weld dimensions</p> <p>spot diameter $d = 4$ spot spacing $(e) = 50$</p> <p>Possible sheet thicknesses: bold = coil sheet</p>  <table border="1" data-bbox="1024 1037 1414 1155"> <thead> <tr> <th>$t \leq$ mm</th> <th>L</th> <th>hi</th> <th>ho</th> <th>H</th> </tr> </thead> <tbody> <tr> <td>2 + 2</td> <td>850</td> <td>140</td> <td>220</td> <td>320</td> </tr> <tr> <td>2,5 + 2,5</td> <td>510</td> <td>250</td> <td>370</td> <td>450</td> </tr> <tr> <td>3 + 3</td> <td>200</td> <td>140</td> <td>220</td> <td>310</td> </tr> </tbody> </table>	$t \leq$ mm	L	hi	ho	H	2 + 2	850	140	220	320	2,5 + 2,5	510	250	370	450	3 + 3	200	140	220	310
$t \leq$ mm	L	hi	ho	H																		
2 + 2	850	140	220	320																		
2,5 + 2,5	510	250	370	450																		
3 + 3	200	140	220	310																		

21. Representation and dimensioning of welding seams


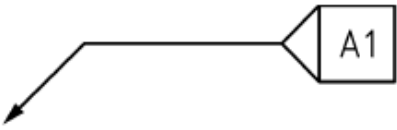
Symbolic representation and execution are to be carried out according to DIN EN ISO 22 553 System A.

Where symbols are included with incomplete dimensioning (seam thickness, seam length, seam spacing), the **reference values** apply.

22. Technical representation of welding symbols with defined testing procedure

Symbol	Usage as below
Example from DIN EN ISO 2553 System A	The welding symbol must always be represented with details of the testing procedure according to the currently valid standard.

Manufacturing Instructions

<p>Open fork</p> 	<p>Details in the fork here as examples for welding process, filler metal and welding position</p>
<p>Closed fork</p> 	<p>A closed fork may only be used in order to emphasize a certain instruction, e.g. a welding instruction, the report on qualification of a welding technique or another document such as a testing procedure (TXT reference)</p>


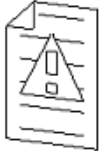
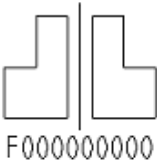
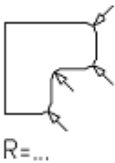
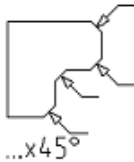


23. Possible leakage test techniques are:

- Color penetration test DIN EN ISO 3452-1
- Overpressure test using leak detection spray or pressure difference measurement
DIN EN 1779
- Underpressure test using a vacuum suction cup and leak detection spray
DIN EN 1779

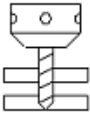
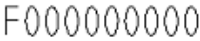

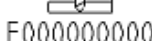
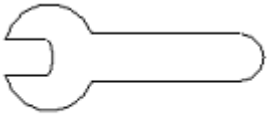




If 'leak-proof' is placed after the welding symbol, the tightness is to be tested using one of the above-mentioned procedures.

Detailed information (supplementary to the symbol on the drawing) on the test procedure are to be included in the object text. A test report is required without fail.

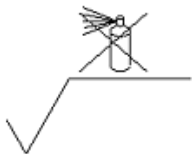
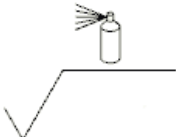
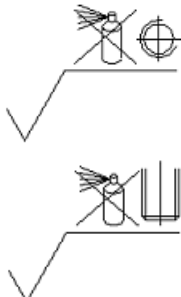

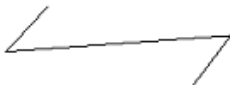
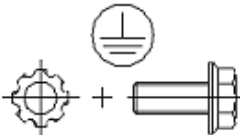
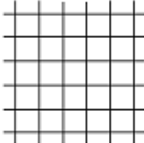
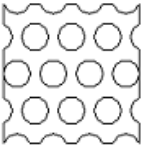
Manufacturing Instructions

24. Text – Symbols on drawings		
No.	Symbol	Application
1		<p>Explanatory text / description which is to be found in the object text in the parts list under 'TXT n'.</p> <ul style="list-style-type: none"> • there is special information available on this point • placement directly at the appropriate location
2		<p>Explanatory text(s) available to the drawing</p> <ul style="list-style-type: none"> • placement above the drawing title block • note on object texts • note on assembly instructions etc.
3		<p>mirror part is available (see item ID)</p> <ul style="list-style-type: none"> • original part = symbol and item ID of the mirrored part • mirrored part = symbol and item ID of the original part
4		<p>collective symbol for all radii not dimensioned</p> <ul style="list-style-type: none"> • placement above the drawing title block
5		<p>collective symbol for all chamfers not dimensioned</p> <ul style="list-style-type: none"> • placement above the drawing title block
6		<p>Extra detail drawing available</p> <ul style="list-style-type: none"> • see drawing number...
7		<p>check dimensions are on drawing</p> <ul style="list-style-type: none"> • placement above the drawing title block


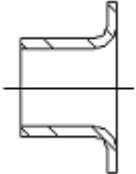
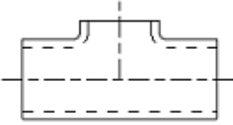
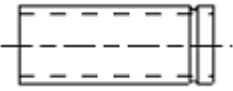

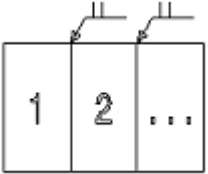
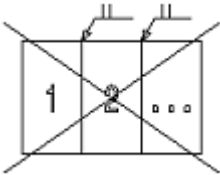
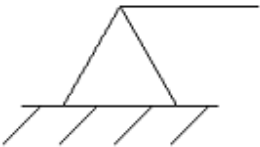
Manufacturing Instructions

8	 	<p>drilled and reamed with ...</p> <ul style="list-style-type: none"> • Placement above the drawing title block or at the respective drill holes • F000000000 = item ID of the other component 																																																		
9	 	<p>drilled on assembly with ...</p> <ul style="list-style-type: none"> • Placement above the drawing title block or at the respective drill holes • F000000000 = Art. No. of the component to be used for drilling out 																																																		
10	 	<p>Bolt tightening torque</p> <p>Screws must be tightened to within +/- 6% of the tightening torque specifications.</p> <p>When selecting the torque tool, make sure that the required torque is between 20% and 80% of the adjustment range of the tool.</p> <ul style="list-style-type: none"> • Placement above the drawing title block or at the respective bolted fittings 																																																		
11	 <table border="1" data-bbox="280 1245 571 1541"> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> <tr><td>M..</td><td>x</td><td>..</td><td>...</td><td>Nm</td></tr> </table>	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	M..	x	Nm	<p>Table for multiple bolt tightening torques</p> <p>Screws must be tightened to within +/- 6% of the tightening torque specifications.</p> <p>When selecting the torque tool, make sure that the required torque is between 20% and 80% of the adjustment range of the tool.</p> <ul style="list-style-type: none"> • placement above the drawing title block
M..	x	Nm																																																
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12		<p>Separation point for transportation</p> <ul style="list-style-type: none"> • Placement at the transport separation points with additional dimensions 																																																		
13		<p>Visible side must not be scratched</p> <ul style="list-style-type: none"> • Placement directly at the respective location or above the drawing title block and the respective location is marked with a dot-dash line parallel to the workpiece contour (— · —) 																																																		

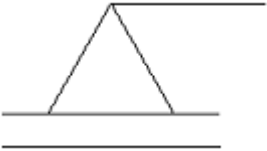

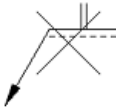


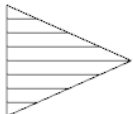
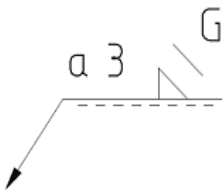


















Manufacturing Instructions

14		<p>Surface must not be painted / coated</p> <ul style="list-style-type: none"> • placement directly at the appropriate location
15		<p>Surface must be painted / coated</p> <ul style="list-style-type: none"> • placement directly at the appropriate location
16		<p>Thread(s) must not be painted / coated</p> <ul style="list-style-type: none"> • Placement above the drawing title block, in which case it applies to all threads • Placement directly next to the respective thread, in which case it applies only to that thread
17		<p>Conveying direction</p> <ul style="list-style-type: none"> • Placement at the respective location
18		<p>Direction of bearing for gratings</p> <ul style="list-style-type: none"> • Placement on the simplified grating representation
19		<p>Earthing of all metallic parts in the assembly</p> <ul style="list-style-type: none"> • placement above the drawing title block • Components required for grounding to be listed in the parts list
20		<p>Representation grid / sieve</p> <ul style="list-style-type: none"> • Placement on the simplified net and sieve representations • Notes on mesh size to be entered into the object text
21		<p>Representation of perforated plate</p> <ul style="list-style-type: none"> • Placement on the simplified perforated sheet representation • Notes on diameter and hole spacing to be entered into the object text

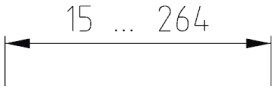
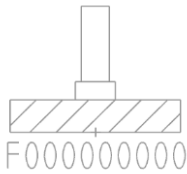
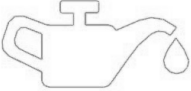
Manufacturing Instructions

22		<p>Representation of stud plate</p> <ul style="list-style-type: none"> • Placement on the simplified stud plate sheet representation • Notes on stud pattern and size to be entered into the object text
23		<p>Preference must be given to the fabrication of flanges.</p> <ul style="list-style-type: none"> • placement above the drawing title block
24		<p>Preference must be given to the fabrication of extrusion(s).</p> <ul style="list-style-type: none"> • placement above the drawing title block
25		<p>Victaulic couplings must be produced at the ends</p> <ul style="list-style-type: none"> • placement above the drawing title block
26		<p>Chip-free Components must be completely free of chips.</p>
27		<p>Multi-part manufacture of the component permitted</p> <ul style="list-style-type: none"> • placement above the drawing title block • The component may be manufactured in multiple parts, whereby the production department may determine how it is to be split up. • If there is a requirement for fixed separating points, these must be indicated and dimensioned on the component.
28		<p>Multi-part manufacture of the component <u>NOT</u> permitted</p> <ul style="list-style-type: none"> • placement above the drawing title block • Manufacture of the component in multiple parts is <u>NOT</u> permitted.
29		<p>Fixed bearing installed at this location</p> <ul style="list-style-type: none"> • placement directly at the appropriate location

Manufacturing Instructions

30		<p>Floating bearing installed at this location</p> <ul style="list-style-type: none"> placement directly at the appropriate location 														
31		<p>Not permitted</p> <ul style="list-style-type: none"> Symbol is placed above a welding sign Means: "Welding is not permitted here." <p>Example</p> 														
32		<p>The extended length of the plate</p> <ul style="list-style-type: none"> Symbol is placed above the title block Indication of the extended length 														
33		<p>Crimp free section</p> <p>Crimp-free section necessary in the area of the bending edge</p>														
34		<p>Corrugation direction</p> <p>For packaging material (corrugated cardboard, twin-wall sheets, ...)</p>														
35		<p>Welding symbol with data about reworking</p> <table border="1" data-bbox="604 1458 1372 2038"> <thead> <tr> <th colspan="2">Supplementary and additional images</th> </tr> </thead> <tbody> <tr> <td data-bbox="604 1514 948 1592">  </td> <td data-bbox="948 1514 1372 1592">Seam surface: hollow (concave)</td> </tr> <tr> <td data-bbox="604 1592 948 1671">  </td> <td data-bbox="948 1592 1372 1671">Seam surface: flat (even)</td> </tr> <tr> <td data-bbox="604 1671 948 1749">  </td> <td data-bbox="948 1671 1372 1749">Seam surface: arched (convex)</td> </tr> <tr> <td data-bbox="604 1749 948 1827">  </td> <td data-bbox="948 1749 1372 1827">Seam surface: Notch-free</td> </tr> <tr> <td data-bbox="604 1827 948 1933">  </td> <td data-bbox="948 1827 1372 1933">remaining inset used</td> </tr> <tr> <td data-bbox="604 1933 948 2038">  </td> <td data-bbox="948 1933 1372 2038">support used</td> </tr> </tbody> </table>	Supplementary and additional images			Seam surface: hollow (concave)		Seam surface: flat (even)		Seam surface: arched (convex)		Seam surface: Notch-free		remaining inset used		support used
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	Seam surface: Notch-free															
	remaining inset used															
	support used															

Manufacturing Instructions

		Selection for reworking the welding seam ¹⁾		
		Letter	Procedure (English)	Procedure (German)
		C	<i>finish by chipping</i>	<i>durch spannende Bearbeitung</i>
		G	<i>finish by grinding</i>	<i>durch Schleifen</i>
		H	<i>finish by hammering</i>	<i>durch Hämmern</i>
		M	<i>finish by machining</i>	<i>durch maschinelle (spanende) Bearbeitung</i>
		R	<i>finish by rolling</i>	<i>durch Walzen</i>
		P	<i>finish by peening</i>	<i>durch Kugelstrahlen / Strahlhämmern</i>
		¹⁾ Letters for the reworking are currently only used in the standards of English-speaking countries, e.g. ANSI/AWS A2.4 and currently not mentioned in the DIN, EN or ISO.		
36		Minimum dimension \square to \square maximum dimension (...)		
37		Welding bolt marking <ul style="list-style-type: none"> To be affixed above the title block of the drawing or at the applicable positions for the welding bolts. F000000000 = Item-ID of the assembly drawing in which the welding bolts are installed. 		
38		Greased / oiled with a lubricant, see object text.		

Manufacturing Instructions

25. Drafting

Drawings are drafted neutral to project and implementation.

When preparing drawings, make sure that no logistical details such as: (provision, to the attention of ..., delivery date, etc.) are indicated on the drawing, BOM or texts describing materials attached to physical materials.

26. Drawing format

Generally, drawing formats according to DIN EN ISO 216 are to be used. If different specifications are made, this will be laid down individually in the contract.

27. Data exchange

CAD data are to be supplied as follows:

- 2D in DGN/DWG format for MicroStation Layout
- 3D in DGN/DWG format for MicroStation Layout
- 3D in Step format for NX Design
- 3D in DXF format for NX Design
- 3D in Parasolid format for NX Design

- Electrical data compatible with EPLAN P8 Version 2.9

Manufacturing Instructions

28. Standard mounting auxiliaries Mounting hubs on shafts

“Gleitmo 800” auxiliary – from FUCHS LUBRICANTS GERMANY GMBH

- Gleitmo 800 is a white high-performance lubricating paste that must be used at a service temperature ranging between -25/+100°C.
- Gleitmo 800 is silicone-free.
- Gleitmo 800 facilitates the assembly and later disassembly of shaft-hub connections.

Standard

The “Gleitmo 800” auxiliary should be used for mounting hubs (with the exception of clamping sets and shrink discs) on shafts.

Deviation from the standard

If a special auxiliary is required, this is indicated on the drawing and specified in the object text.

If no auxiliary is required, this is indicated on the drawing and noted in the object text.

Application:

“Gleitmo 800” should be thinly applied to clean, preferably degreased sliding surfaces with a brush or lint-free cloth.

Manufacturing Instructions

29. Surface treatment Procedure for painting

If a surface treatment is required, it must be carried out according to the following specifications.

Pre-treatment:

- | | | |
|--|----------------------|--|
| black steel | - Manual degreasing: | wash off with solvent
e.g. TURCO prepaint |
| | - PT plant: | degreasing and phosphating |
| Galvanised steel / hot-dip
aluminised sheet steel (FAL) | - Manual degreasing: | wash off with acetone |

Colour shades according to RAL colour chart

The required paint quality can be obtained from Brillux GmbH & Co. KG Industrielack.

Brillux GmbH & Co. KG Industrielack
Otto-Hahn-Strasse 14
59423 Unna, Germany
Tel. +49 2303 8805-0
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www.brillux-industrielack.de

Alternative paints and paint suppliers may only be used if they have the same physical and optical properties as the paints from Brillux GmbH & Co. KG Industrielack.

Affected items on the parts list must be marked and painting requirements must be specified.

The relevant data sheets from Brillux GmbH & Co. KG can be found in appendix 1-2 of these technical data sheets.

Onejoon Standard:

Coating buildup	Color	Degree of gloss	Layer thickness	Hardener/ Mixing ratio
1K Adhesive Primer 5408 Adhesion primer that can be universally used, particularly on coil coating substrates.	beige	matt	≥40 µm	-
2K-PUR Acrylic Paint 5747 Two-component polyurethane textured paint with excellent gloss and colour stability for interior and exterior use	RAL- colour shades of your choice!	silk gloss 60-70 GU/60° (according DIN EN ISO 2813)	40-80 µm	5770.-.0010 5 : 1 Weight.-%

Manufacturing Instructions

30. Surface treatment techniques without painting

Sand blasting

Scale, rust and coatings are removed so that residue only remains visible as light nuances due to tinting of pores. The blasting material must be completely removed.

Pickling, galvanizing, powder coating

Generally the following applies:

Electro galvanizing is to be carried out according to DIN EN ISO 2081

The parts are degreased, pickled, electrolytically degreased, deoxidized, galvanized electrolytically using a weak acid and then blue trivalent chrome passivated. By way of orientation, we aim for a galvanizing layer of 8 µm.

Untreated or unpainted components must always be protected from corrosion by being wrapped in VCI foil!

Manufacturing Instructions

31. Processing instructions for edged and perforated panels

Hot-dip aluminised sheet steel:

- The visible side of the panels must not have any scratches or show any white rust spots. Marking on visible side see chapter 24. Text – Symbols on drawings No. 13
- Paint welding points (if any) with special quality grade 283 aluminium bronze from Brillux.

Sendzimir galvanised sheet steel:

- The visible side of the panels must not have any scratches or show any white rust spots. Marking on visible side see chapter 24. Text symbols on drawing No. 13
- Paint welding points (if any) with Brillux zinc dust paint 128.

Stainless steel sheet:

- The visible side of the panels must not have any scratches. Marking on visible side see chapter 24. Text symbols on drawing No. 13
- Treat welding points (if any) with pickling paste.

Design type and surface quality according to DIN EN 10088-2

The following surface quality is specified for stainless steel sheets in 1.4307, 1.4541, 1.4404, 1.4571.

for 1D the following applies	>= 3.0 mm sheet metal: hot-rolled, heat-treated, pickled and scale-free (pickled = matte)
for 2B the following applies	<2.5 mm sheet metal: cold-rolled, heat-treated, pickled and cold re-rolled (pickled = matte)

Manufacturing Instructions

32. Manufacturing regulations hot-dip galvanized sheet steel and stainless steel - plate processing

1. The manufactured components must have no scratches. The profile must not be scratched on the visible side.
(The adjacent edge radii and cut edges are also included as part of the visible side.)
Marking on the visible side chapter 24. Text – Symbols on drawing No.13
Adhere to the following tolerances:
All edges must be achieved with $90^\circ \pm 30'$.
The permitted torsion angle is 1° along the total length.
2. Plates and reinforcements have to be designed in a way that allows no clearances when assembled.
3. Fundamentally, cambers at the welding seams or other unevenness, e.g. sagged roots or welding spatter must be removed.
Welding seams must be produced level, have no pores, notches and no flank errors.
Distortion is to be avoided as far as possible.
No fluff must catch during cleaning later using a wool cloth.
Risk of injury must be excluded.
4. Do not grind extensively (e.g. in the vicinity of the welding seam). Risk of corrosion due to damage of the aluminum coating or stainless steel surface!
5. **Under no circumstances** use lacquers, sealant and similar materials not compatible with paint.
6. After manufacture, the components must be 'swept clean'.
Cleaning must only be carried out dry, without a cleaning agent.
7. The components must be processed and stored dry.
The packaging for transportation to the delivery address must be selected so that contamination and humidity cannot ingress into the components.

For hot-dip galvanized sheet steel plate

8. The welds must be produced so that the hot-dip galvanized sheet steel coating does not burn the in the area of the seam and on the rear of the plate.

For stainless steel plate

9. Tempering colors must be completely removed.

Manufacturing Instructions

33. Manufacturing regulations plastic processing

Plastic parts

(e.g. gear wheels etc.)

1. The manufactured components must have no scratches.
2. Deburr all cut edges.
Fundamentally, cambers at the welding seams or other unevenness, e.g. sagged roots or welding spatter must be removed.
Welding seams must be produced level, have no pores, notches and no flank errors.
Distortion is to be avoided as far as possible.
No fluff must catch during cleaning later using a wool cloth.
Risk of injury must be excluded.
3. After manufacture, the components must be 'swept clean'.
Cleaning must only be carried out dry, without a cleaning agent.
4. The components must be processed and stored dry.
The packaging for transportation to the delivery address must be selected so that the component is not damaged and contamination and humidity cannot ingress into the components.

Manufacturing Instructions

34. Appendix 1 1K Adhesive Primer 5408



Technical Data Sheet

1C Adhesion Primer 5408

Universal adhesion primer, particularly suitable for coil-coating substrates

Basis

Acrylic resin

Color

Beige, redbrown, light-gray, white, black

Gloss grade

Matt

Properties

- excellent adhesion even on difficult substrates
- fast drying
- can be sanded and over-coated after approx. 15 min. (depending on coating thickness)
- best used as an adhesion primer for coil-coated sandwich elements
- not suitable for heavy corrosion protection

Field of application

Use as an adhesion primer on difficult surfaces in combination with appropriate top coatings (see coating recommendation) for highest weather resistance. Perfectly suitable for garage doors, shop design, trade fair construction, vending machines, container, doors and door frames.

Technical data

Density

1.10 to 1.31 g/cm³ ¹⁾
(in accordance with DIN EN ISO 2811)

Theoretical coverage

249 to 314 m²/kg ¹⁾
(at 1 µm dry film thickness)

Solids content

47 to 60 weight % ¹⁾

Delivery viscosity at 20 °C

90 to 120 sec./DIN 4 mm

Stability

150 to 200 µm (wet film)

Flash point

> 23 °C

Labelling

See current safety data sheet.

1) depending on color

Coating recommendation

Substrates ²⁾	Prime coat	Intermediate coat ⁴⁾	Top coat
Galvanized steel ³⁾	1C Adhesion Primer 5408 30 to 40 µm	2C Epoxy Primer 5706 ⁵⁾ 40 to 80 µm	Synthetic Resin Paint 5460, 5461, 5462 40 to 60 µm
Aluminum Non-ferrous metals ³⁾ Many plastic materials ³⁾	1C Adhesion Primer 5408 30 to 40 µm	n/a	
Coil-Coating	1C Adhesion Primer 5408 15 to 20 µm		

2) Generally, the substrate must be free from grease, oil, separating and drawing agents as well as corrosion products and other impurities.

3) An adhesion test should be carried out.

4) Before applying topcoats in intense colors, an intermediate coat in RAL 9010 (approx. 40 µm) with 5461.-9010 is required (see technical data sheet 5460, 5461, 5462).

5) In order to prevent the formation of zinc soap, a sealer (2C Epoxy Primer 5706) has to be applied when using synthetic resin top coats on galvanized substrates.

5408

Date: 28.10.2014

Page 1 of 2

Manufacturing Instructions



Technical Data Sheet

Process

Material has to be stirred until homogeneous before application.

Thinning

Universal Thinner 5117.
Disperse homogeneously by stirring.

Application temperature

≥ 10 °C

Air humidity

< 75 % r. h.

Compatibility

Compatibility is given only in combination with the thinners and paints mentioned in this Technical Data Sheet.

Application

Air spraying, air-mix spraying, airless spraying, electrostatic spraying (with the needed conductivity).

Drying

Air drying

(at + 20 °C, 65% r. h.)
Dust-dry after 10 to 15 minutes, non-sticky and ready for re-working after 15 to 20 minutes, dry after approx. 1 hour.

At lower temperatures and/or higher air humidity longer drying times are possible.

Spray data

Process	Nozzle	Pressure	Application viscosity ¹⁾
Air spraying	1.2 to 1.5 mm	3 to 5 bar (air)	20 to 30 sec.
Airless spraying	0.28 to 0.38 mm	100 to 150 bar (material)	40 to 50 sec.
Air-mix spraying	0.28 to 0.38 mm	100 to 150 bar (material) 1.0 to 1.5 bar (air)	40 to 50 sec.

1) measured in DIN 4 mm flow cup (in mixture).

Packaging

30 kg

Storage

1 year after receipt.
Store in original closed container, dry and at room temperature. Protect against heat and direct sunlight.

Remark

This Technical Data Sheet is based on intense development work and many years of practical experience. The contents do not constitute any contractual relationship. The user/buyer is not released from his/her obligation to test our products for suitability for the intended application. In addition, our General Terms and Conditions shall apply.

As soon as a new edition of this Technical Data Sheet is issued, the previous specifications become invalid. If you need the current version, please contact your Brillux consultant.
Version 8

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Manufacturing Instructions

35. Appendix 2 Technical Data Sheet 2C PUR Acrylic Paint 5746 - 5747

Technical Data Sheet

2C PUR Acrylic Paint

5746 gloss

5747 silk gloss

Two-component textured polyurethane paint with excellent gloss and colour stability for indoor and outdoor use in two degrees of gloss



Field of application

As a decorative, highly weather-resistant quality ideally suited for appliances, automobile accessories, construction elements/structural sections (steel and aluminum), construction machines, farming machines, furniture (interior), garage doors, garden furniture and equipment, household appliances, medical equipment, shop and trade fair designs, lamps/lights, machines, motors, drives, commercial vehicles, control cabinets, door and fence systems, door and window frames, doors, as well as vending machines.

Properties

- excellent weather resistance
- good adhesion to many substrates
- high mechanical resistance
- good resistance to chemicals and solvents
- permanent temperature resistance up to 100 °C ¹⁾
- fast drying
- high degree of stability
- Effect images from fine to coarse structure achievable
- once fully cured the paint film is physiologically safe

¹⁾ In construction, in accordance with coating build-up

Technical data

Basis	Combination of hydroxyacrylate and aliphatic polyisocyanate
Colors	All common color systems
Degree of gloss	5746 gloss 5747 silk gloss
Density	1.0 to 1.5 g/cm ³ (in accordance with DIN EN ISO 2811) ²⁾
Theoretical coverage	360 m ² /kg (with 1 µm dry film thickness) ²⁾³⁾
Solids content	58 to 68 weight-% ²⁾
Delivery viscosity at 20 °C	thixotropic
Flash point	> 23 °C

Manufacturing Instructions

Technical data

Labeling	See current safety data sheet.
Accelerated weathering Xenon	after 1.000 h residual gloss \geq 50 % of initial gloss (in accordance with DIN EN ISO 16474-2)
	²⁾ depending on color
	³⁾ in mixture

Coating recommendation

Substrates ⁴⁾	Prime coat	Intermediate coat	Top coat
Steel preferably sand-blasted (degree of purity at least SA 2 ½ in accordance with DIN EN ISO 12944, Part 4), iron or zinc-phosphated.	2C PUR AC Primer 5705 40 to 60 µm	If required (film thickness specification), a second layer can be applied with the corresponding primer. For top coats in intense color shades (see application), an intermediate coating in color shade RAL 9010 (approximately 40 µm) is required with 5742.-.9010.	2C PUR Acrylic Paint 5746, 5747 40 to 80 µm
Cast Iron	2C PUR High Solid Primer 5703 40 to 80 µm		
Galvanized steel			
Aluminum	2C Epoxy Primer 5706 40 to 80 µm		
Non-ferrous metals among others			

⁴⁾ Generally, the substrate should be free from grease, oil, separating and drawing agents as well as corrosion products and other impurities.

Hardener

PUR-Hardener	5770.-.0010 5770.-.0011 (standard curing) 5770.-.0020 (slowly curing) 5770.-.0030 (fast curing)
Basis	Aliphatic polyisocyanate
Shelf life	6 months after receipt. Store in a sealed container in a dry place and at room temperature (max. 25 °C). Protect from heat sources and direct sunlight.
Minimum shelf life	Refer to label
Mixing ratio	5 : 1 weight-% (4 : 1 vol.-%)
Mixing	As 2C system, the actual paint and the hardener are supplied separately and mixed homogeneously in the specified mixing ratio just before application.

Manufacturing Instructions

Process

Material has to be stirred until homogenous before application.

Thinner PUR Thinner 5102 (medium-volatile)
PUR Thinner 5101 (slowly volatile)
Disperse homogeneously by stirring.

Pot life 4 to 6 h (at 20 °C)

Application temperature > 10 °C (object temperature 3 °C above dew point)

Humidity < 80 % relative humidity

Application Air spraying.

Compatibility Compatibility is given only in combination with the hardeners, thinners and primers mentioned in this Technical Data Sheet.

Implementation in intense color shades Brilliant intense color shades, in particular in the realms of yellow, orange, red, magenta and yellow-green (for the RAL Classic Uni Color Shades affected, see below) have a lower hiding power. For these color shades, we recommend an intermediate coating in color shade RAL 9010 (approximately 40 µm) with 5742.-.9010.

RAL Classic color shades affected:

RAL 1003	RAL 2001	RAL 3011
RAL 1004	RAL 2002	RAL 3013
RAL 1006	RAL 2003	RAL 3016
RAL 1007	RAL 2004	RAL 3018
RAL 1012	RAL 2008	RAL 3020
RAL 1016	RAL 2009	RAL 3027
RAL 1017	RAL 2010	RAL 3031
RAL 1018	RAL 2011	RAL 4002
RAL 1021	RAL 3000	RAL 4004
RAL 1023	RAL 3001	RAL 4007
RAL 1028	RAL 3002	RAL 4010
RAL 1032	RAL 3003	RAL 6018
RAL 1033	RAL 3004	RAL 6026
RAL 1037	RAL 3005	RAL 8023
RAL 2000	RAL 3007	

Drying

Air-drying (at + 20 °C, 65 % r.h.) Dust dry after approx. 30 minutes, Tack-free and suitable for recoating after approx. 2 hours, fully dry after 16 to 24 hours. Cured after 7 days.

Oven drying Adhere to approx. 30 min. flash-off time. Then force-dry the coating for approx. 30 min. at an object temperature of approx. 60 °C.

It is only possible to dry or cross-link the applied paint film at temperatures above + 5 °C. The drying time decreases with the temperature increase.

Manufacturing Instructions

Spray data

Process	Nozzle	Pressure	Application viscosity ⁵⁾
Air spraying fine structure	1.3 to 1.5 mm	4 to 5 bar	Undiluted Distance: approx. 25 cm
Air spraying coarse structure	1.5 to 2.5 mm	2 to 3 bar	Undiluted Distance: up to approx. 50 cm

⁵⁾ Measured in DIN 4 mm flow cup (in mixture).

Packaging

25 kg
Further container sizes available upon request.

Shelf life

24 months after receipt.
Store in a sealed container in a dry place and at room temperature (at most 25 °C). Protect from heat sources and direct sunlight. Always keep the containers tightly sealed. Protect the contents from surface drying and drying out. Dried paint residues and surface-dried skin are insoluble in paint and can only be removed by sieving.

Minimum shelf life refer to label

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