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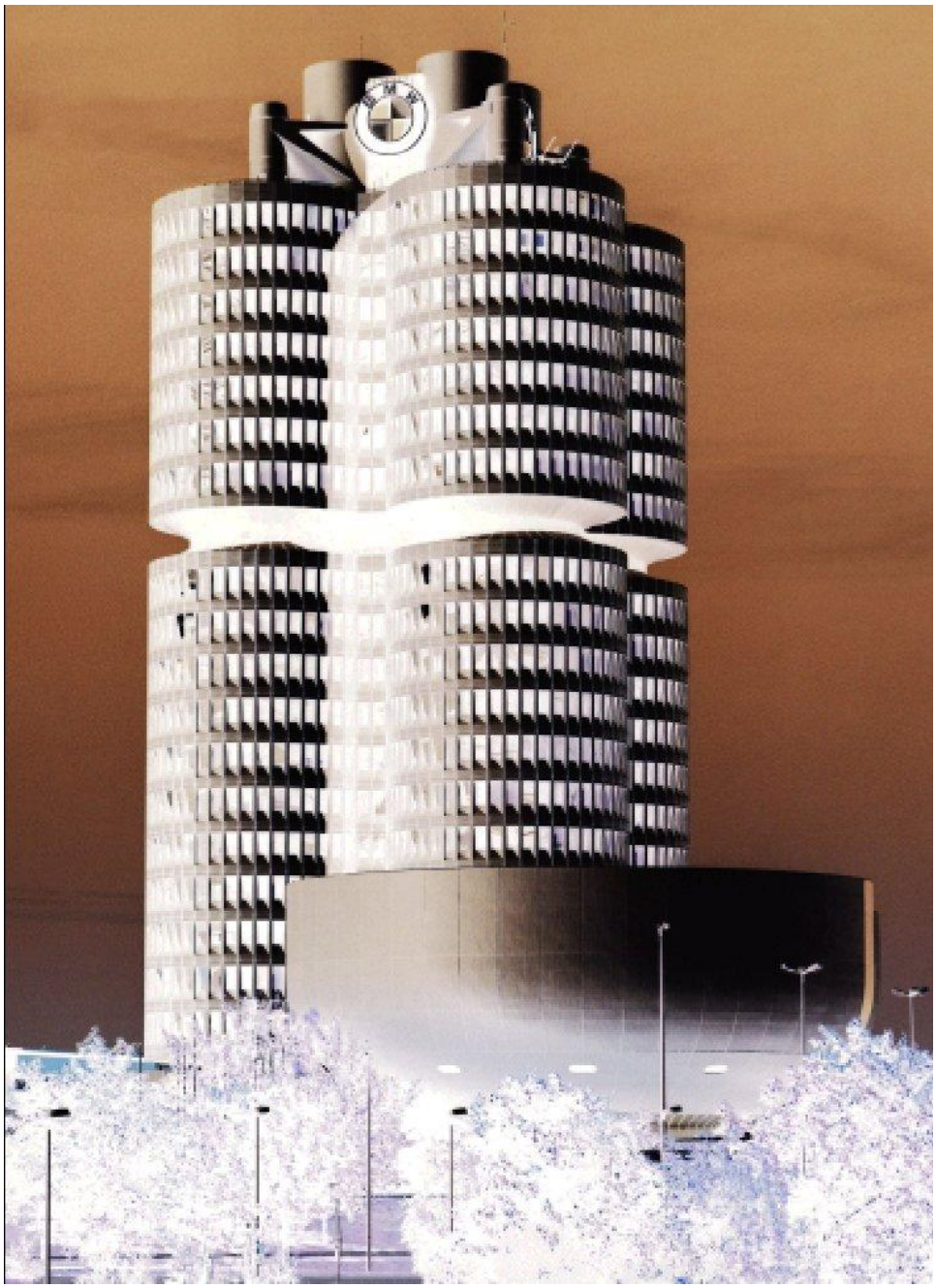
Design and Production Directives for the Construction of Floor Conveyor Equipment



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Contents

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1. General directives for floor conveyor equipment

The quality of our containers and floor conveyor equipment guarantees the quality of parts during the handling process.

To ensure that these high standards are maintained, these production directives are mandatory.

They form part of a complete quality standard for the design and production of floor conveyor equipment that is reproducible at any time and complies with DIN ISO 9001.

They establish standards for the materials and also the production methods and techniques to be used.

The supplier must guarantee that the materials, tubes and sections listed here have been used in accordance with the DIN and BMW standards quoted here, and that the production methods and techniques described here were employed.

Submission of an offer by the supplier, which must be free of charge, acknowledges the contents of these Design and Production Directives and undertakes to comply with them.

Deviations from the contents of these directives, and any special arrangements that are agreed upon, must always be formulated in writing before samples of the floor conveyor equipment are produced or series production commences.

In addition, the General Contractual Terms of BMW AG, with which the supplier is familiar, remain valid in all respects.

2.General requirements for floor conveyor equipment

All cut edges must be deburred; hollow sections must be deburred internally and externally in all cases.

In the case of closed stackable floor conveyor containers the steel outer walls must be moved in by at least **5 mm** from the outside of the uprights in order to prevent wear/abrasion during handling.

Metal elements that are fully or partly enclosed within plastic, such as PVC hoses, molded film or toothed strip, must be painted first.

Panels, pockets for accompanying documents or separately marked, exposed surfaces for documents accompanying the goods must be at least of A5 format and at least 10 mm from the outer surfaces. Such panels or surfaces must be provided with an EVA mesh grill (e.g. Type 0815/60 as supplied by the Norddeutsche Seekabelwerke company), which must be either attached in a weatherproof manner with adhesive or secured with blind rivets.

In the case of floor conveyor containers with stacking pins, the upper end section of the uprights is to be reinforced, have a minimum width of 30 mm and be welded on both sides.

2.1 EPP standard

BMW's EPP standard as defined in 16.2 is to be complied with.

2.2 ESD protection for packaging

Packaging materials providing the necessary ESD protection are to be used in accordance with **BMW Group Standard 95009 –1/-2**.
A copy of this standard will be supplied on request.

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3. Materials

3.1 Steel grades

Fully killed steel of grade **S 235 JR G2** according to EN 10 027 and **ECISS IC 10** is to be used (former designation of steel: **R ST 37-2**).

3.2 Plastics

ABS	Acrylonitrile butadiene styrene
PC	Polycarbonate
PE	Polyethylene
PU	Polyurethane
PVC	Polyvinyl chloride
PP	Polypropylene

PU, PC and PVC are to be used only in special circumstances, for example soft PVC as a jacket for round tube.

DIN 16 940	Permissible dimensions – deviations for soft PVC hoses
Protefan/Blasoplast Spezial	Trade designation of material supplied by the F. Blasberg company = 55% PVC / 36% plasticizer / 1% pigment, for the plastic coating of metal sections

3.3 Disposal of plastics

1. The supplier undertakes to take back its plastic products and subject them to an approved recycling process.

2. Plastic materials must be marked with pictorial symbols and identification codes as laid down in DIN 6120.

4. Steel tube and section

The steel tubes and sections used must comply with:

DIN 2394	Welded precision steel tube rolled to dimension
DIN 2395	Welded precision steel tube of rectangular or square cross-section
DIN 1028	Hot-rolled steel angle with uniform side length and rounded edges
DIN 1017	Hot-rolled steel strip
DIN 1026	Hot-rolled U-section steel with rounded edges
DIN 1541	Cold-rolled sheet

5. Connecting elements

Only galvanized or nickel-plated bolts, screws and locknuts or those of higher quality are to be used for threaded connections (customary commercial forms: blue galvanized/yellow galvanized).

Only bolts and screws of strength category 8/K are to be used.

BMW N 113 39.0	Hex nuts with locking device; BMW standard based on DIN **6924**
DIN 7337	Blind rivet with galvanized steel pin (head sizes: small ∅ 11mm – large ∅ 14mm)
Spring lock:	Cadmium-plated or higher quality Examples of recommended manufacturers: - Femma - Hahn - Viebahn

Version with weld tag or thread.

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6. Base structures

6.1 Stacking feet – wire-mesh box pallets

- (Box pallet with stacking feet, DIN 15 555), drawing No. 3102537
  used for base section 820 mm wide
  (see Page 9)

- (Stacking pins) used for square tube, 40 x 3 mm

6.2 Stacking feet – stacking pins

- (Stacking pins) drawing No. 3100418
  used for square tube, 50 x 4 mm
  (see Page 10)

- (Stacking pins) drawing No. 3100119
  used for square tube, 60 x 3.5 mm

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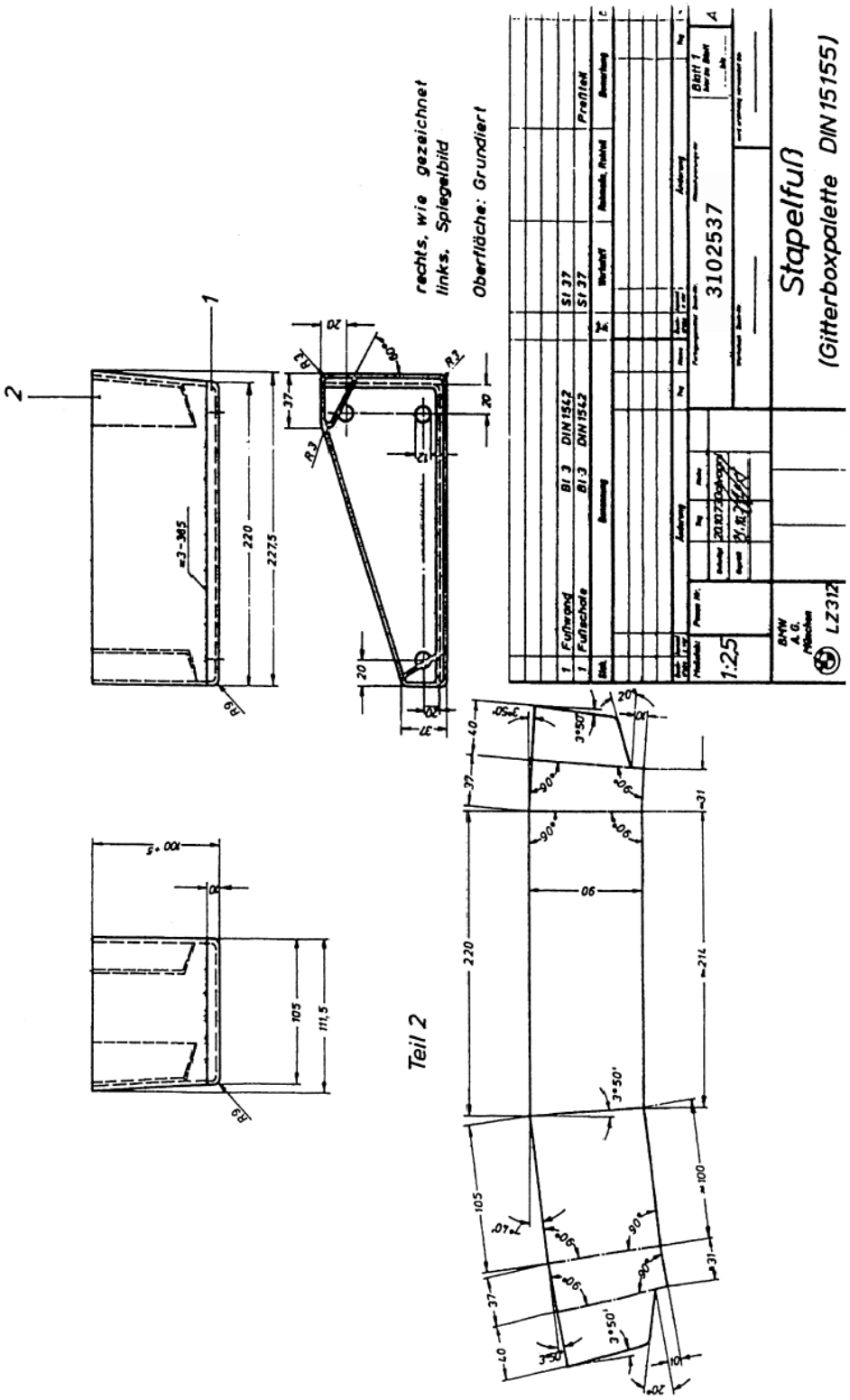
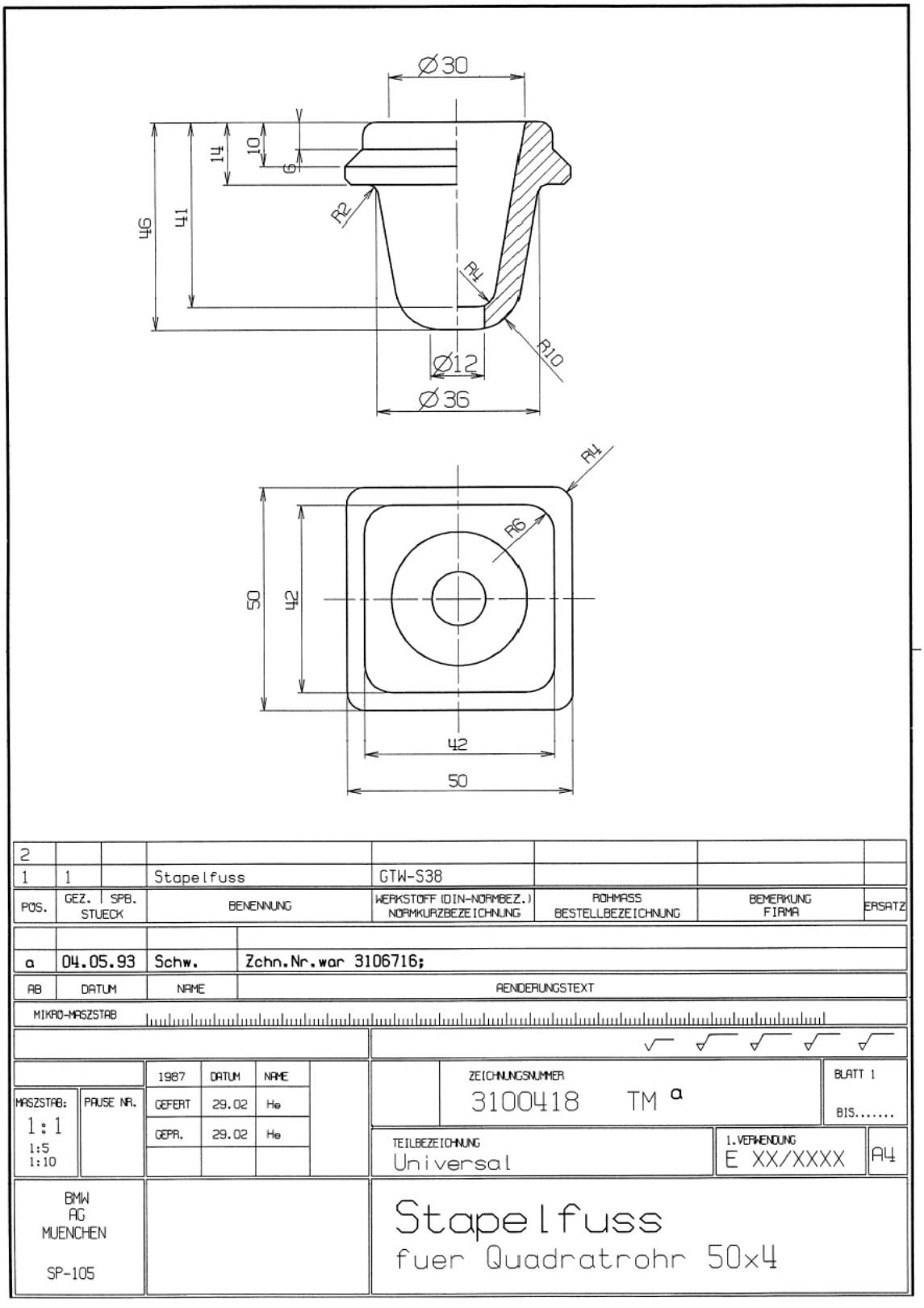
6.1 Stacking feet – box pallets



6.2 Stacking feet – stacking pins



2							
1	1		Stapelfuss	GTW-S38			
POS.	GEZ. / SPB. STUECK		BENENNUNG	WERKSTOFF (DIN-NORMBEZ.) NORMKURZBEZEICHNUNG	ROHMASS BESTELLBEZEICHNUNG	BEMERKUNG FIRMA	ERSATZ
a	04.05.93	Schw.	Zchn.Nr.war 3106716;				
AB	DATUM	NAME	AENDERUNGSTEXT				

MIKRO-MASZSTAB

	1987	DATUM	NAME
MASZSTAB: 1:1 1:5 1:10	GEFERT	29.02	He
PAUSE NR.	GEPR.	29.02	He

ZEICHNUNGSNUMMER 3100418 TM a

BLATT 1 BIS.....

TEILBEZEICHNUNG Universal

1.VERWENDUNG E XX/XXXX

A4

BMW AG MUENCHEN

SP-105

Stapelfuss
fuer Quadratrohr 50x4

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7. Welded joints

Requirements: **DIN 18 800 Part 7**

Shorter welding test certificate
Persons carrying out welding work must hold the shorter welding test certificate.

Welding methods: **MIG** metal arc – inert-gas welding
MAG metal arc – active gas welding

8. Welding requirements

8.1 Weld seams

DIN EN 25 817 assessment group C (C = medium)

All weld seams must comply with this standard unless other requirements are imposed.

8.2 General quality requirements for welded structures

Vertical tubes are to be welded at top and bottom and provided with a water drain at the lowest point.

Exception:
End frame for press shop (see Page 39).

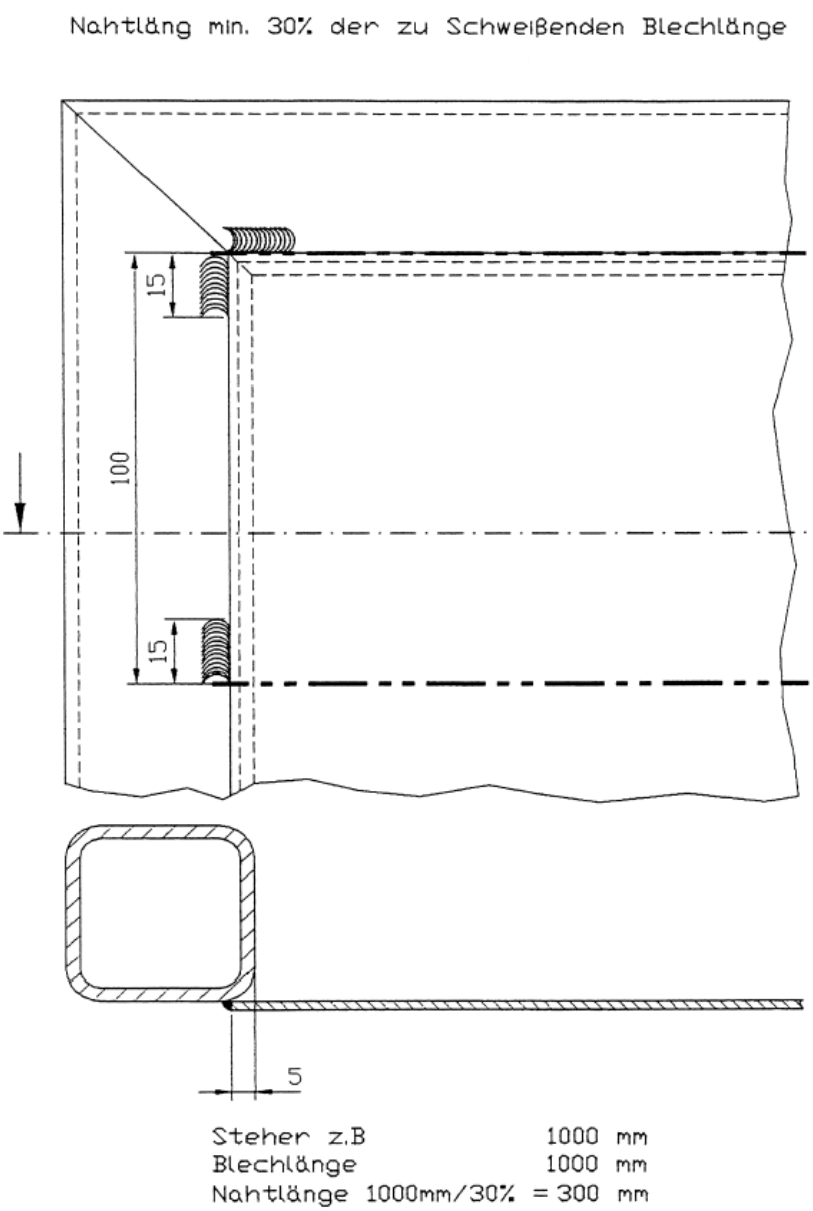
Sheet metal panels must always be welded on.
Corners must be through-welded to min. 15 x 15 mm.

On straight sections the weld seams must be approx. 15 – 20 mm long; at least 30% of the total length must be welded, with the weld seams distributed symmetrically over the full length (see Chapter 8.3).

At sheet metal panels (including bases), overlap with the supporting sections must not exceed 5 mm (see Chapter 8.3).

Lids or covers that extend beyond the outer contour of the floor conveyor container must cover the vertical sheet metal panels.

8.3 Drawing of weld seam length for sheet metal



9. Floor conveyor equipment lettering/type plate

All floor conveyor equipment (German abbreviation: FFG) is to be marked with the FFG Ident. No., the component name, the BMW emblem and an indication of BMW ownership. Lettering on the FFGs should be of the maximum possible size for better legibility.

The conversion status of floor conveyor equipment must also be shown so that it can be identified. This form of identification (painting) must be applied to the diagonally opposed outer faces of the uprights (minimum height of painted identification 200 mm from top). The conversion status is to be indicated by the following colors:

Conversion status A (1st modification): Signal blue, RAL 5005
Conversion status B (2nd modification): Ivory, RAL 1014
Conversion status C (3rd modification): Pure orange, RAL 2004

This identification is repeated on the floor conveyor container as “Stand (status) X” after the Ident. No.

Identification paint/ink: black/white

In the case of special floor conveyor containers with rigid paneling, the FFG Ident. No. is to be applied by flexographic printing on all four sides, if possible using a color in strong contrast to the surface color.

If two or more containers are identical (left-hand drive/right-hand drive, containers of similar appearance for different suppliers etc.), these must at least be marked diagonally over the corner of each upright.

All floor conveyor equipment must carry the manufacturer’s mark.

Regulation ZH 1/428 issued by the Süddeutsche Metall- and Berufgenossenschaft (South German Metal Trades and Industrial Accident Insurers) calls for floor conveyor equipment to be additionally marked to show the permissible payload and supported load separately. This regulation is complied with by the standardized BMW type plate as follows:

Design requirements

The following information is to be stamped on the type plate (see drawing in Annex):

BMW emblem with inscription “Eigentum BMW AG” for German plants; for foreign plants: “Property BMW” plus the appropriate legal form)

Exception:

For containers used both within Germany and abroad, the lettering must be neutral (“Eigentum BMW/Property BMW”), for instance as on 310 1860 containers.

-
- FFG No. of the container (large)
- Permissible payload
- Permissible supported load
- Tare weight
- Year of manufacture
- FFG manufacture/place of manufacture

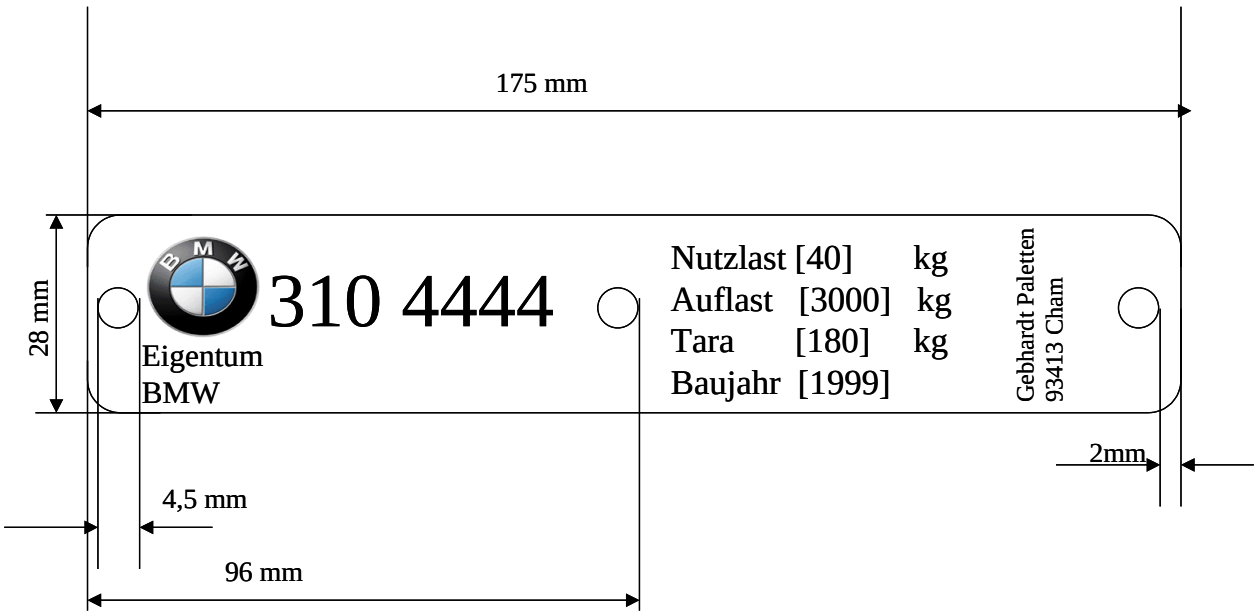
Position: If possible on the front of the left or right uprights, but not on the outside of the container; 200mm from the top of the base frame, otherwise as individually appropriate

Attachment: by 3 blind rivets with 4.5mm dia. holes (aluminum river sleeve, galvanized steel rivet pin) with mushroom head, shank diameter = 4mm
Clamping length as required (depending on thickness of material at attachment point); rivet head diameter: 10mm

Type plate dimensions: 175 mm x 28 mm x 0.5 mm

Material: stainless steel

Pattern: corners of type plate rounded off



Schematic design drawing of type plate, with dimensions

10. Floor conveyor equipment corrosion-proofing/painting

Painting of floor conveyor equipment

Floor conveyor s are to be painted in accordance with **BMW Group Standard GS 97001** (see Chapter 16.4); the minimum coating thickness must be 60 µ.

Container colors: Universal containers: RAL 4008 signal violet
Special containers: RAL 6027 light green

11. Design requirements for base

In all cases, lower struts (connecting the two stacking feet) must be attached at a length of ≥1250 mm as shown in the drawing (11.2).

Lower struts are to be provided at the material removal side and one narrower side (end).

Stacking shoes (insertion aids) are to be attached diagonally at a minimum spacing of 620 mm.

Stacking feet should be welded all round on the outside.

Please refer to the design drawings for details of the design directives to be complied with.

Design drawings for the following base assemblies:

11.1.1 Base for 1230 x 830 mm – part list

Weld seams without specific details: welded all round to **DIN EN 25817-C** general tolerances for welded structures; lengths and angle dimensions: **DIN EN ISO 13920–A**
All cut edges must be deburred.

Pos.	gez. / spb. Stück		Benennung	Werkstoff (DIN-Normbez.) Normkurzbezeichnung	Rohmaß Bestellbezeichnung	Bemerkung Firma	Ersatz
11	4		Flachstahl 25x5	RSt 37-2 DIN 1017	40		
10	2		Blech 2.0 dick	DIN EN 10131	252x370		
9	4		Blech 2.0 dick	DIN EN 10131	252x390		
8	4		Flachstahl 40x12	RSt 37-2 DIN 1017	178		
7	2		Stapelfuß vo.re.; hi.li.		Z-Nr.; 30.66.-04		
6	2		Stapelfuß vo.li.; hi.re.		Z-Nr.; 30.66.-04		
5	2		Rechteckrohr 40x20x3	RSt 37-2 DIN 2395	235		
4	4		Rechteckrohr 40x20x3	RSt 37-2 DIN 2395	242.5		
3	2		Rechteckrohr 40x20x3	RSt 37-2 DIN 2395	1160		
2	2		U-Stahl 40x35x5	RSt 37-2 DIN 1026	760		
1	2		U-Stahl 40x35x5	RSt 37-2 DIN 1026	1230		

ÄB	Datum	Name	FM-Sach-Nr.-Ausstelldatum	BL. I - NEU - NEUE FORM - GEÄNDERT - ENTFÄLLT - STÜCKL. - BLATT

Mikro-Maßstab 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

für spanende Fertigung Maße o. Toleranz DIN 7168 mittel

Oberflächen DIN-ISO 1302 $\sqrt{}$ rgh $\sqrt{}$ Rz63 $\sqrt{}$ Rz16 $\sqrt{}$ Rz4 $\sqrt{}$ Rz1

FMC-4: T-NN		1999	Datum	Name	Nat.-Kennz.	Sach-Nr. Fertigungsmittel	Klassifizierungs-Nr.
Maßstab	Pause-Nr.	Gefert.	11.02	Hahn			Blatt 1 bis 1/1
1:5		Geprüft			Sach-Nr. Teil		Stichwort-Nr./1. Verwendung: E
							A2

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SP-103

zu Baugruppe

zu Gesamtzeichnung

Bodengruppe für Rechteckrohrgestell 1230x830

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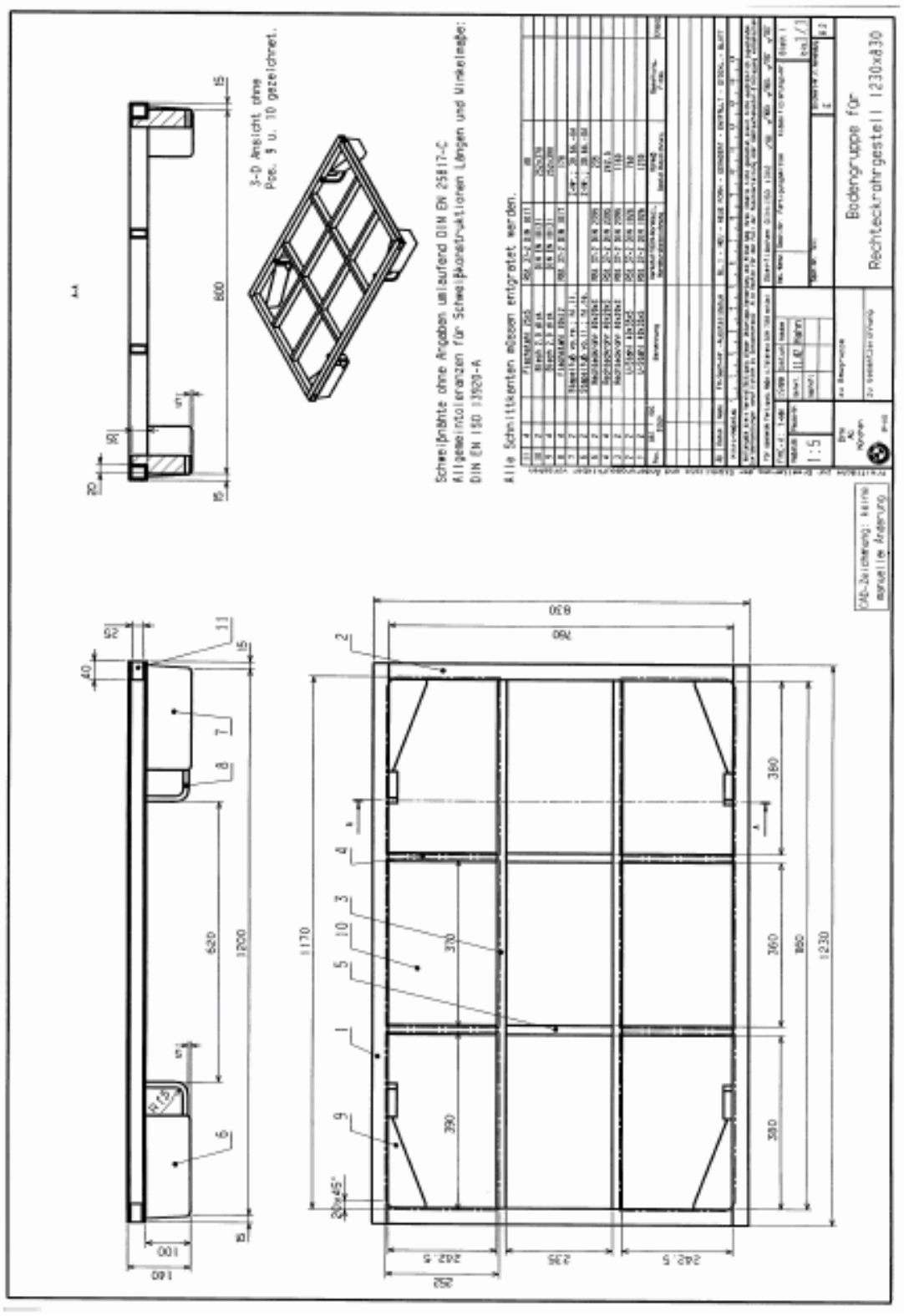
11.1.2 Base for 1230 x 830 mm – drawing



11.2.1 Base for > 1230 x 830 mm – part list

Space beneath base between feet, free-standing container: 100 mm; when stacked: min. 65 mm.

Length of foot min. 200 mm, width of foot min. 70 mm, all lower and outer edges rounded off, no projecting weld seams.

Base of containers suitable for high-bay stores closed from the outside for min. 200 mm on each longer side.
Weld seams without specific details: all round, to **DIN EN 25817-C** standard.

General tolerances for welded structures, lengths and angles: **DIN EN ISO 13920–A**
All cut edges must be deburred.

Pos.	gez.	spb.	Benennung	Werkstoff (DIN-Normbez.) Normkurzbezeichnung	Rohmaß Bestellbezeichnung	Bemerkung Firma	Ersatz
10							
9							
8							
7	3		Winkel L 40x5	RSt 37-2 DIN 1028	83		
6	4		Flachstahl 25x5	RSt 37-2 DIN 1017	40		
5	2		Stapelfuß vo.re.; hi.li.		Z-Nr.; 30.66.-04		
4	2		Stapelfuß vo.li.; hi.re.		Z-Nr.; 30.66.-04		
3			Flachstahl 40x12	RSt 37-2 DIN 1017			
2			Quadratrohr 40x3	RSt 37-2 DIN 2395			
1			U-Stahl 40	RSt 37-2 DIN 1026			

Stück

ÄB	Datum	Name	FM-Sach-Nr.-Ausstelldatum	BL.1 - NEU - NEUE FORM - GEÄNDERT - ENTFÄLLT - STÜCKL.- BLATT

Mikro-Maßstab 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Für spanende Fertigung Maße o. Toleranz DIN 7168 mittel

Oberflächen DIN-ISO 1302 roh Rz63 Rz16 Rz4 Rz1

FMC-4:	1999	Datum	Name
Maßstab 1:5	Gefert.	11.02	Hahn
Pause-Nr.	Geprüft		

Nat.-Kennz. | Sach-Nr. Fertigungsmittel | Klassifizierungs-Nr. | Blatt 1 bis 1./.1

Sach-Nr. Teil | Stichwort-Nr./1. Verwendung: E | A0

BMW AG München

SP-103

zu Baugruppe

zu Gesamtzeichnung

Bodengruppe für Rechteckrohrgestell >1230x830

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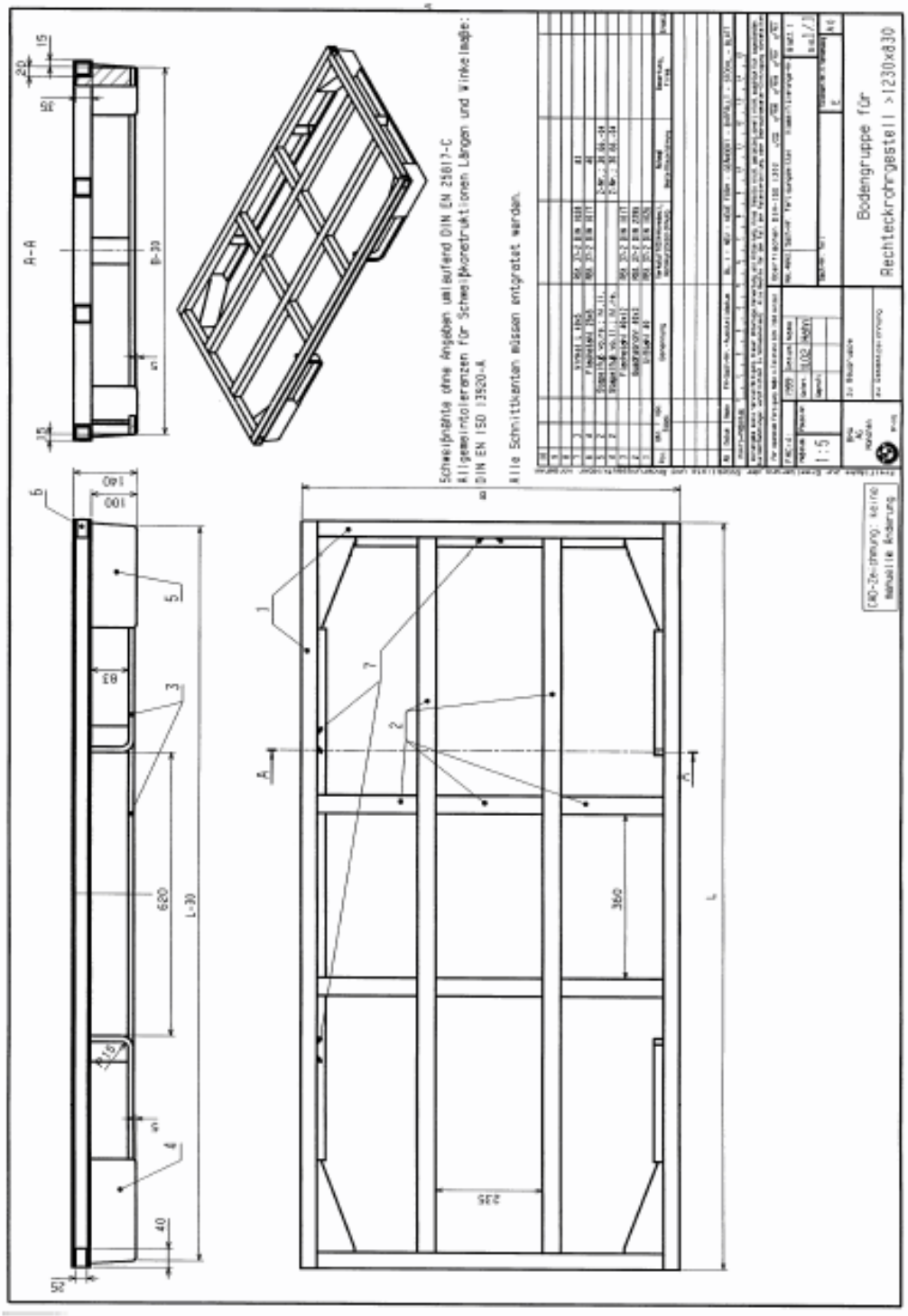
11.2.2 Base for > 1230 x 830 mm – drawing



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12. Stacking frame

When stacked, the maximum stacking clearance (difference between stacking and stacking foot angles)must be 20 mm.

Insertion depth when stacked min. 30 mm.

Metal bars at the end of the stacking angles must be welded inside and out.

The stacking frame for the 1240 x 835 mm base must be designed to accept all base/foot designs with corner-to-corner dimensions of 1200 x 800 mm.

If the stacking angle is > 50 mm, a horizontal water drain hole with a minimum diameter of 10 mm is to be provided centrally.

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13. Quality assurance

The supplier is responsible for the quality of all the containers it produces.

13.1 Inspection during series production

Outturn samples

A production outturn sample is to be submitted before series production starts. The auxiliary equipment, gauges and fixtures intended for series production are to be used to make this sample.

The relevant department of BMW AG will state the place at which acceptance of the series-production outturn sample is to take place.

The series-production outturn sample must be identified as such.

Acceptance for series production

Before series production containers are delivered, either BMW AG employees or independent testers commissioned by BMW AG (e.g. SGS-Controll Co. or TÜV) will carry out a quality and function test..

For this reason, the relevant planner at BMW AG is to be notified at least two weeks in advance of the intended date of delivery and a date for the acceptance inspection agreed.

If quality or functional defects are detected during this inspection, they must be rectified free of charge by the supplier, who must take the agreed delivery schedule into consideration.

14. Use of most recent information

The supplier must make sure that the sample container is manufactured in all cases in accordance with the most recent valid issues of the relevant BMW standards, DIN standards and the current production component specification.

The supplier is responsible for acquiring the DIN standards mentioned in this directive.

Source: Beuth Verlag GmbH,
Burggrafenstrasse 6, 10787 Berlin, Germany

BMW's internal standards are included in the Annex.

14.1 Clarification

Before submitting an offer the supplier must clarify with the responsible departments all technical queries that could arise as a result of differences in the interpretation or application of drawings, standards or the sample container.

Deviations from the specified standards or drawings are not permitted without prior consultation with and written confirmation from the responsible BMW AG departments.

14.2 Persons to contact

If any queries arise, please contact the planners in the relevant departments.

14.3 Drawings

If the supplier produces drawings, they must take the general directives and **BMW N 11332.0 T1** into account and be provided with a BMW text panel.

15. Specific requirements for press shop/body-in-white area

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Press shop/body-in-white areas
Logistic planning and control

Technical supply conditions
Construction of containers for the press shop/body-in-white areas

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Basic information on the construction of special containers

The special containers used by BMW AG for the transportation and delivery of components normally consist of a standard outer frame and an insert matched to the component being carried.

The standard frame consists of a base frame tat can be made in various sizes, and two end frames or individual uprights. The base has a wire-mesh surface and may be equipped with width extensions.

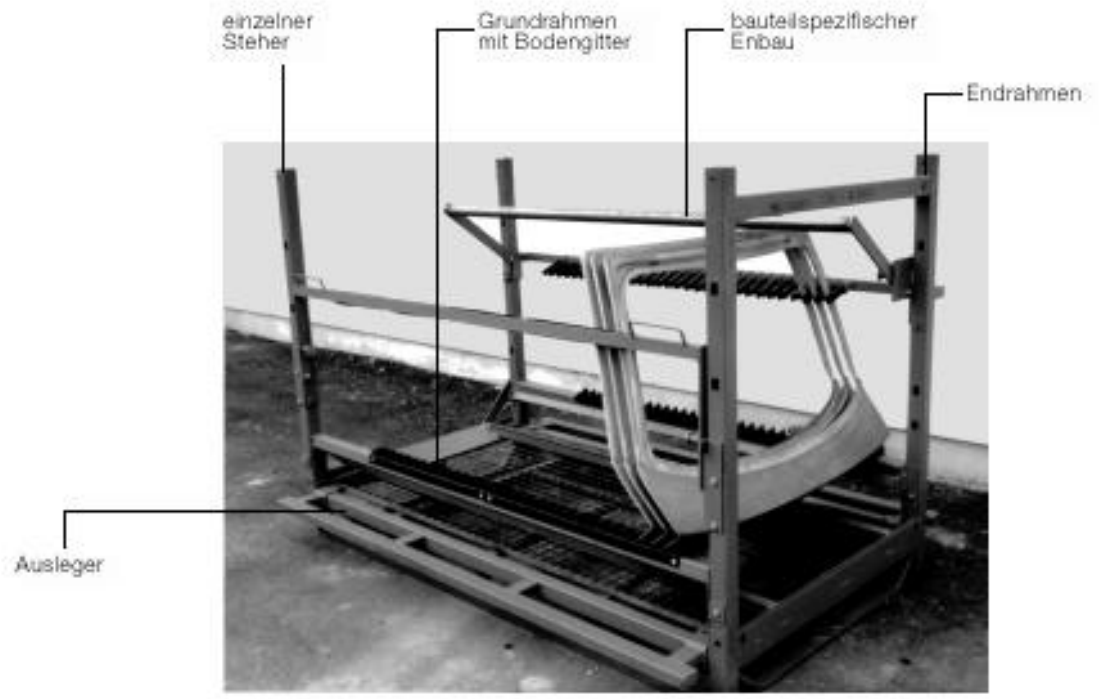

Abbildung 1: Aufbau eines Sonderbehälters

Fig. 1: Special container construction

The standard frame (rack) elements are stocked on behalf of BMW AG by the Gillhuber company in Garching-Hochbrück (Gutenbergstrasse 29, 85748 Garching, Germany) and can be collected from there by agreement with the responsible BMW department.

Rack components

The table below lists the rack components in regular use and their dimensions. Rack components are pre-painted.

Non-standard sizes may only be used after confirmed approval has been obtained from the Press Division.

Table 1: Standard rack component dimensions

Customary base frame sizes (in mm)	1000	x	1200
	2000	x	1200
	2200	x	1200
	2400	x	1200
	2500	x	1200
	3000	x	1200
	3200	x	1200
	3500	x	1200
	3700	x	1200
	3800	x	1200
	4000	x	1200
Customary end frame sizes (in mm), 1200 mm wide	500	x	1200
	750	x	1200
	1000	x	1200
	1250	x	1200
	1500	x	1200
	1750	x	1200
1000 mm wide	500	x	1200
	750	x	1200
	1000	x	1200
Customary width extension sizes (in mm)	50	x	Base frame length
	100	x	Base frame length
	150	x	Base frame length
	200	x	Base frame length
	250	x	Base frame length
	300	x	Base frame length
Customary sizes of uprights (in mm)	500		
	750		
	1000		
	1250		
	1500		
	1750		
Customary wire-mesh base assemblies	Depending on base frame dimensions		

Lettering

All containers are to be marked with a container serial number, component designation, model designation and Ident. No. on the outside of the end frame cross-member.

Lettering templates for container marking will be supplied by BMW AG free of charge; the paint color for the lettering is black.

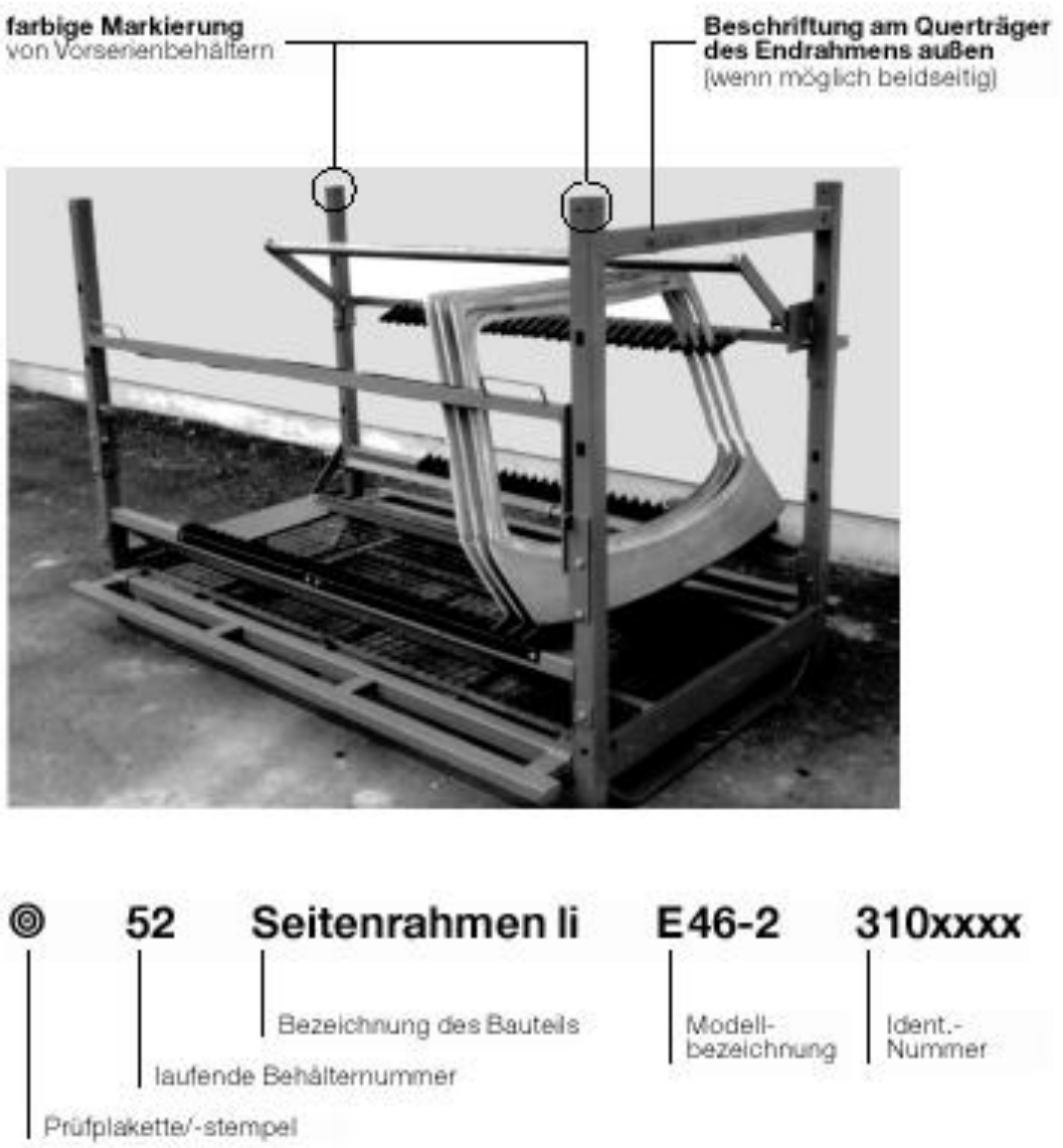

Fig. 2: Markings on special containers

Miscellaneous

The open upper ends of the uprights or end frames must all be provided with a transverse M6 x 70 screw and, on the inside, a self-locking nut (see Fig. 3).

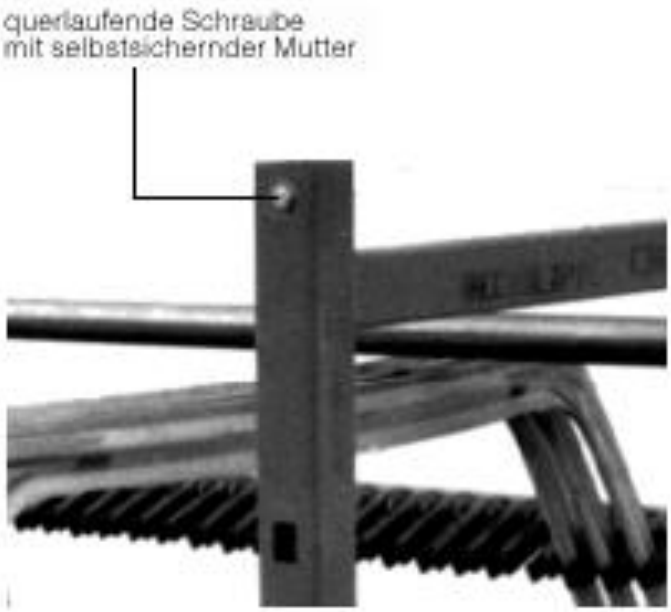

Fig. 3: Design of section ends

16. Standards referred to

DIN ISO 9 001	Quality assurance systems; Model for presentation of quality assurance in Design/Development, Production, Assembly and After Sales Service
DIN EN 10 025	Hot-rolled non-alloyed steel products
DIN 16 940	Permissible dimensions – deviations for PVC hoses
DIN2394-1	Welded precision steel tube rolled to dimension; dimensions
DIN 2394-2	Welded precision steel tube rolled to dimension; technical delivery conditions
DIN-2395	Welded precision steel tube rolled to dimension; rectangular or square cross-section
DIN 1028	Hot-rolled steel angle with rounded edges and sides of equal length
DIN 1029	Hot-rolled steel angle with rounded edges and sides of unequal length
DIN 1017	Hot-rolled steel strip
DIN 1026	Hot-rolled U-section steel channels with rounded edges
DIN 1541	Cold-rolled sheet metal
DIN 6924	Hex nuts with locking device
DIN 7337	Blind rivets with galvanized steel pin
DIN 15 155	Stacking feet for wire-mesh box pallets
DIN 18 800 Part 7	Shorter welding certificate
DIN EN ISO 13 920	General tolerances for welded structures

DIN EN 25 817	Arc welded joints in steel
DIN ISO 2768	General tolerances Length and angle tolerances if not stated individually
BMW N 113 39.0	Hex nut with locking device (DIN 6924)
BMW GS 97001	Painting floor conveyor equipment
BMW N 113 32.0 T1	Technical drawings
BMW GS 95009 –1 / 2	ESD standard
Supplier of DIN standards:	Beuth Verlag GmbH, Burggrafenstrasse 6, 10787 Berlin, Germany

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16.1 DIN standard – general tolerances

16.11 Lengths and angles, general

General tolerances according to **DIN ISO 2768 – m:**
Length and angle tolerances

Werte in mm

	Grenzabmaße für Nennbereiche							
Tolenanz-klasse	von 0,5 bis 3	über 3 bis 6	über 6 bis 30	über 30 bis 120	über 120 bis 400	über 400 bis 1000	über 1000 bis 2000	über 2000 bis 4000
m = mittel	**± 0,1**	**± 0,1**	**± 0,2**	**± 0,3**	**± 0,5**	**± 0,8**	**± 1,2**	**± 2**

16.12 Welded structures: lengths and angles

DIN EN ISO 13 920-A (A =tolerance class)
Length limits

	Nennbereich in mm					
Tolenanz-klasse	2 bis 30	über 30 bis 120	über 120 bis 400	über 400 bis 1000	über 1000 bis 2000	über 2000 bis 4000
	Grenzabmaße in mm					
A	**± 1**	**± 1**	**± 1**	**± 2**	**± 3**	**± 4**

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16.2 EPP standard

Ident. No. label

- Material: PP (polypropylene, suitable for recycling)
- Number of labels/foam trays: **2**
- Position, layout, type of text, content: see Annex, Examples 1 and 2
- Minimum text area size: **200 mm x 40 mm**
- **Colors:** Text: **black;** background: **white**
- Recommended: corners rounded off for greater durability
- Position the label such that it remains visible even if the hinged doors of external container 3101860 are closed, in other words **at least 150 mm** away from each edge on the longer side of the foam tray (see drawing). Check the necessity of also applying a label of maximum size along the transverse sides of each foam tray (marking on all four sides).

Konstruktive Ausführung

- Minimum wall and base thicknesses, height of stacking edge: see Annex, Example 2
- Handle recess size: 80 mm x 10 mm x 10 mm
  slightly cut away, centrally located on both sides
- Chamfers and rounded-off edges to suit BMW requirements
- Stacking edge on two opposed sides, in each case on the shorter side in the tray removal direction; see Annex, Example 2
- For the 310 1860 external container, all the permissible EPP foam trays are shown as a table in the Annex; see Annex, Example 3
- CA models: see Annex, Example 2
  3D CAD models of the EPP trays in format CATIA V5, STEP and IGES have been finalized as 3D CAD models (geometric versions) to be taken over for specific EPP containers. The CATIA V5 data set contains a parametrically built-up model with the complete table. 3D CA models are available in STEP and IGES formats for all external dimensions and for 5 heights as examples (stacking factor 2, 6, 10, 14 and 18). The data can be located on the Internet at:

  http://zulieferer.bmw.de/tec/coc/tm/cad/container/intro.html

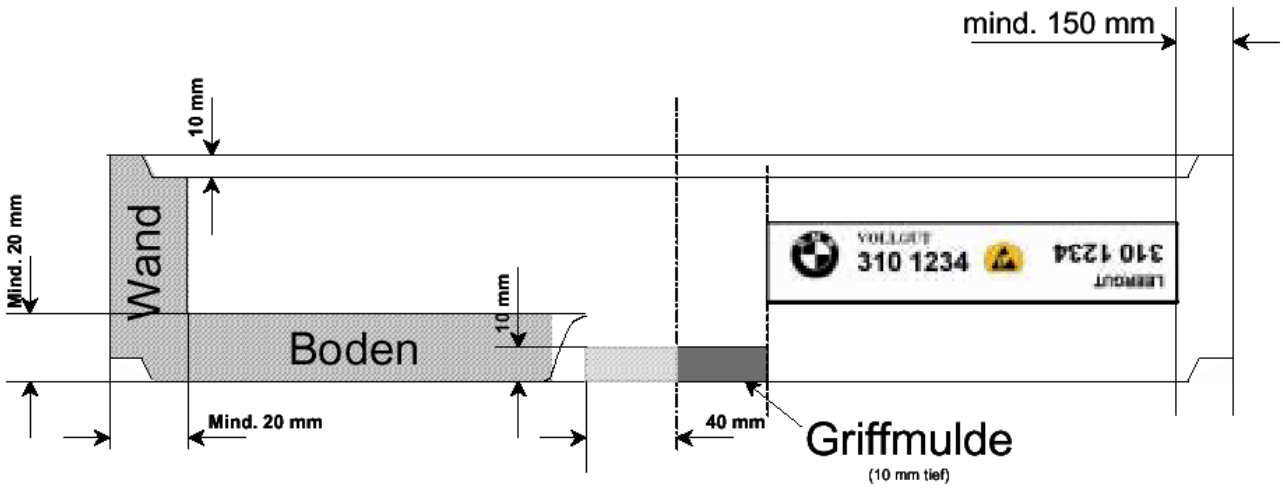
Characteristic material values – EPP

- Color of material: **black (exceptions are possible)**
- Minimum tensile strength acc. to DIN 53571: **880 kPa**
- Minimum density: **60 g/l** (tolerance: +/- 10%)
- For component that must comply with BMW's ESD protection requirements, the surface resistance according to DIN EN 61340-5-1/2 is to be complied with throughout the EPP foam tray material

Annex

Example 1: Original format and specimen text for lettering panel (with ESD protection symbol)

Example 2: Layout of inscription label on foam tray:
front view of EPP foam tray with stacking edge on two sides:



Example 3: Standard table of dimensions – EPP foam tray for 310 1860

Standard-Maßtabelle für EPP-Schaumtabletts im Aussenbehälter 310 1860

Randbedingung: Lichte Innenmaße für Außenbehälter 310 1860
L x B x H : 1180 x 810 x 840 [mm x mm x mm]

Legende: Außenbehälter Innenbehälter

Behältertyp		1	2	3	4
Draufsicht, symbol.					
Aussenmaß L x B [mm x mm]		1170 x 790	1170 x 395	585 x 790	585 x 395
Stapelrand		zweiseitig, an jew. kürzeren Seite	zweiseitig, an jew. kürzeren Seite	zweiseitig, an jew. kürzeren Seite	zweiseitig, an jew. kürzeren Seite
Stapel -faktor	Höhe H [mm]	Kennung	Kennung	Kennung	Kennung
2	415	1-2	2-2	3-2	4-2
3	280	1-3	2-3	3-3	4-3
4	215	1-4	2-4	3-4	4-4
5	174	1-5	2-5	3-5	4-5
6	146	1-6	2-6	3-6	4-6
7	127	1-7	2-7	3-7	4-7
8	112	1-8	2-8	3-8	4-8
9	101	1-9	2-9	3-9	4-9
10	92	1-10	2-10	3-10	4-10
11	84	1-11	2-11	3-11	4-11
12	78	1-12	2-12	3-12	4-12
13	73	1-13	2-13	3-13	4-13
14	68	1-14	2-14	3-14	4-14
15	64	1-15	2-15	3-15	4-15
16	61	1-16	2-16	3-16	4-16
17	58	1-17	2-17	3-17	4-17
18	55	1-18	2-18	3-18	4-18
19	53	1-19	2-19	3-19	4-19

Note:

- A lid or cover for the uppermost layer of the EPP foam tray, for example a 310 4802 intermediate-layer cover, is recommended to avoid contamination, damage etc.

16.3 ESD protection (see Chapter 2.2)

BMW Group

Konzern Norm Group Standard	GS 97001 **Mai/**May 1999
Deskriptoren: Flurfördergerät, Lackierung Descriptors: Floor conveyor, Painting	**Ersatz für BMWN 60130.0: 1996-04** Supersedes BMW S 60130.0: 1996-04

16.4 Lackierung von Flurfördergeräten
Anforderungen und Prüfungen

Painting of containers
Requirements and testing

Ausdrucke unterliegen nicht dem Änderungsdienst
Print-outs are not subject to the change service

Fortsetzung Seite 2 bis 4
Continued on pages 2 to 4

BMW AG Normung Konzern
80788 München

interleaf-doc

BMW Group

In case of dispute the German wording shall be valid.

Inhalt

Contents

Vorwort
Diese Konzern Norm wurde mit den verantwortlichen Bereichen des BMW Konzerns abgestimmt.

Foreword
This Group Standard has been coordinated with the responsible departments of the BMW Group.

Änderungen
Gegenüber der BMWN 60130.0: 1996-04 wurden folgende
Änderungen vorgenommen:
– In Konzern Norm umgewandelt
– Die englische Übersetzung wurde aufgenommen
– Das Beschichtungsverfahren B wurde gestrichen
– Die Norm wurde redaktionell überarbeitet

Amendments
The following amendments have been made to BMW S 60130.0: 1996-04:
– Converted into Group Standard
– English translation added
– Coating process B deleted
– Standard editorially revised

Frühere Ausgaben
BMWN 60130.0: 1987-11; 1996-04

Previous editions
BMW N 60130.0: 1987-11; 1996-04

1 Anwendungsbereich and Zweck
Diese Konzern Norm gilt für die Lackierung von Metallteilen
in Flurfördergeräten (z.B. Behälter, Paletten).
Holz- and Kunststoffteile bleiben, sofern nicht anders
angegeben, unlackiert.
Es werden die Anforderungen an die Lackqualität und die
entsprechenden Prüfungen festgelegt.

1 Scope and purpose
This standard is applicable to the paint finish of metal parts
in floor conveyors (e.g. boxes, containers, pallets).
Wooden and plastic parts remain unpainted, unless
otherwise specified.
The requirements posed and the paint quality and
corresponding tests are specified.

BMW Group

2 Normative Verweisungen

Diese Norm enthält Festlegungen aus anderen Publikationen. Diese normativen Verweisungen sind an den jeweiligen Stellen im Text zitiert und die Publikationen sind nachstehend aufgeführt. Es gilt die letzte Ausgabe der in Bezug genommenen Publikation.

DIN EN ISO 2409	Lacke und Anstrichstoffe; Gitterschnittprüfung
VDA 621-402	Anstrichtechnische Prüfungen; Salzsprühnebelprüfung an Anstrichen und ähnlichen Beschichtungen
RAL 840 HR	Farbregister

3 Zeichnungseintragung

Der Zeichnungseintrag erfolgt im Schriftfeld unter Oberflächenbehandlung oder in der Nähe des Schriftfeldes.

Bezeichnung einer Lackierung für ein Flurfördergerät (FFG), im Farbton RAL 4008:

GS97001-FFG-A-RAL-4008

Andere Farben nach RAL-Farbregister.

4 Beschichtungsverfahren

Der Oberflächenschutz wird durch eine lufttrocknende, witterungsbeständige Lackierung erreicht die in zwei Schichten als Grundierung and Decklackierung aufgebracht wird. Die Grundierung ist in einem von der Decklackierung abweichenden Farbton auszuführen. Die Prüfbedingungen nach Abschnitt 6 sind zu erfüllen.

5 Anforderungen

5.1 Allgemeines
Der Untergrund muß vor der Lackierung von Rost, Zunder, Fett, Staub und sonstigen Verunreinigungen vollständig befreit sein.
Die Lackierung muß auf dem Untergrund gut haften und darf die Funktion nicht beeinträchtigen.

5.2 Lack
Die Lacke dürfen keine blutenden Pigmente und kein Silikon enthalten.
Die Farben werden aus dem RAL-Farbregister 840 HR gewählt.

5.3 Schichtdicke
Unabhängig vom Beschichtungsverfahren ist eine Gesamtschichtdicke von 60 µm einzuhalten, die auch an Blech- und Profilschnittkanten und anderen schwer zugänglichen Stellen erreicht werden muß.

2 Normative references

This standard incorporates provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. The respective latest edition of the publication is applicable.

DIN EN ISO 2409	Paints and varnishes; cross-cut test
VDA 621-402	Paint-coating-related tests; Salt spray test on paints and similar Coatings
RAL 840 HR	Color register

3 Drawing entry

The relevant data are entered in the title block in the field Surface Treatment or in close proximity to the title block.

Designation of a paint finish for a floor conveyor (German: Flurfördergerät – FFG), Process A in color RAL 4008:

GS97001-FFG-A-RAL-4008

Other colors according to RAL-Color-Register.

4 Coating process

Surface protection is effected by means of an air-drying paint coat which is resistant to weathering. Two layers of paint coat are applied as base coat and top coat. Application of the primer is to be in a color different from the top coat. The test requirements specified in section 6 must be met.

5 Requirements

5.1 General information
Prior to application of the paint coat, scale, grease, dust or any other pollutants must be completely removed from the surface.
The paint coat must show good adhesive strength and must not impair the function of the component.

5.2 Paint
The paint must not contain pigments that bleed out or silicones.
The colors are selected from RAL color register 840 HR.

5.3 Layer thickness
Irrespective of the coating process a total paint coat thickness of 60 µm must be built up, including sheet- and profile cutting edges and other areas with difficult access.

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6	**Prüfungen**
6.1	**Klimatische Beständigkeitsprüfung**
6.1.1	Salzsprühnebelprüfung
	Die Prüfung erfolgt nach dem VDA-Prüfblatt 621-402, geforderte Note Wd ≤2 mm. Die Testdauer beträgt 72 Stunden.
6.2	**Mechanische Prüfung**
6.2.1	Gitterschnittprüfung
	Die Prüfung erfolgt nach DIN EN ISO 2409, geforderte Note ≤2. Lose anhaftende Lackteilchen werden mit Klebeband vorgegebener Klebekraft (entsprechend 4651 Fa. Beiersdorf) entfernt.

6	**Tests**
6.1	**Weathering resistance test**
6.1.1	Salt spray test
	Testing is in accordance with VDA test sheet 621-402, required grade Wd ≤2 mm. The test duration is 72 hours.
6.2	**Mechanical test**
6.2.1	Cross-cut test
	Testing is in accordance with DIN EN ISO 2409, required grade ≤2. Loosely adhering paint particles are removed with adhesive tape of specified adhesive power (equivalent to 4651, supplier Beiersdorf).

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16.5 Hex nuts with locking device

(non-metallic insert)

BMW Works Standard

113 39.0

Dimensions in mm

Ersatz für Ausgabe
08.88

1 Drawings

This standard is based on German Industrial Standard DIN 6924.
This standard contains requirements for hex nuts with a locking element (a non-metallic insert), with metric thread and a nominal thread diameter of 4 to 16 mm, in Product Class A.

2 Dimensions

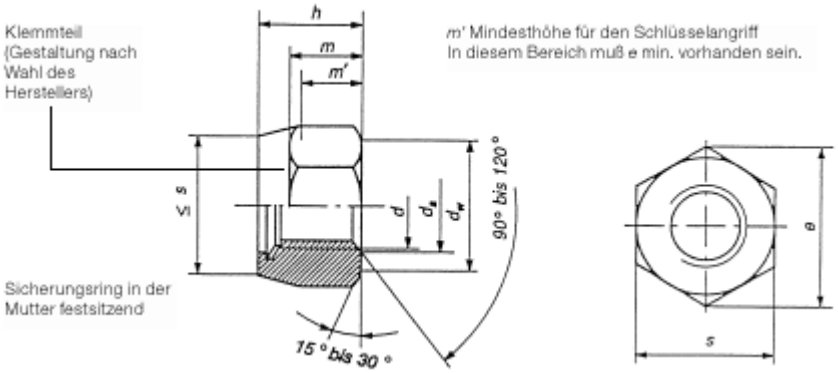

Table 1: Dimensions

		M4	M5	M6	M(7)	M8	M10	M12	(M14)	M16
Thread d		-	-	-	-	M8x1	M10x1	M12x1.5	(M14x1.5)	M16x1.5
P[1]		0.7	0.8	1	1	1.25	1.5	1.75	2	2
d_a	min.	4	5	6	7	8	10	12	14	16
	max.	4.6	5.75	6.75	7.75	8.75	10.8	13	15.1	17.3
d_w	min.	5.9	6.9	8.9	9.6	11.6	14.6	16.6	19.6	22.5
e	min.	7.66	8.79	11.05	12.12	14.38	17.77	20.03	23.35	26.75
h	min.	6	6.8	8	9	9.5	11.9	14.9	17	19.1
	max.	5.7	6.44	7.64	8.64	9.14	11.47	14.47	16.3	18.26
m	min.[2]	2.9	4.4	4.9	6.14	6.44	8.04	10.37	12.1	14.1
m`	min.	2.32	3.52	3.92	4.91	5.15	6.43	8.3	9.68	11.28
s	Nom. dim. = max.	7	8	10	11	13	16	18	21	24
	min.	6.78	7.78	9,78	10,73	12,73	15,73	17,73	20,67	23,67

Threads shown in brackets should be avoided if possible.
[1] *P* = Regular thread pitch according to DIN 13 Part 12.
[2] Also minimum thread height

Note:
Preference should be given to the use of hex nuts according to BMW N 113 38.0.

3 Technical delivery conditions

Table 2: Requirements

Material		**Steel**
General requirements		acc. to DIN 267 Parts 1 and 15
Thread	Tolerance	6H[1)]
	Standard	DIN13 Part 15
Mechanical properties (body of nut)	Strength class (material)	8, 10; 12
	Standard	DIN ISO 898 Part 2, DIN 267 Part 23
		If boron-alloyed material is used, the grade must be at least 35 B2 acc. to DIN 1654 Part 4 for strength class 12.
Material (locking ring)		PA 66, heat resistant
Tightening torques		acc. to BMW N 600 02.0
Functional properties		acc. to DIN 267 Part 15, but surface of test screw in strength class 8: ZN, in classes 10 and 12: PHR
Dimensional limits, shape and position tolerances	Product class	A (previously m)
	Standard	DIN ISO 4759 Part 1
Surface		As manufactured
		Surface roughness: DIN 267 Part 2 applies
		Permissible surface flaws: DIN 267 Part 20 applies
Marking		Strength class 8: lock ring dyed blue
		Strength class 10: lock ring dyed white
		Strength class 12: lock ring dyed red
		Additional marking according to DIN 267 Part 15 is permitted.
Surface protection		According to BMW N 600 00.0
Lubricant		The lubricant must possess properties that enable tightening torques and preload values according to BMW N 600 02.0 to be guaranteed.
Acceptance test		DIN 267 Part 5 applies

[1)] Thread tolerance 6 H applies to nuts either with or without surface protection.

4 Designation

Designation of a hex nut with locking device (non-metallic insert), with thread d = M12, strength class 8 and ZN surface:

Sechskantmutter BMW N 113 39.0 – M12 – 8 – ZN
(hex nut)

Notes:

Thread projection acc. to DIN 78, but at least 2P
Nuts are not to be re-used.
Authorized suppliers: subject to supplier approval