



## CORPORATE PURCHASING SPECIFICATION

AA10724

Rev No. 08

PAGE 1 of 2

## STAINLESS STEEL BARS (AUSTENITIC) SOLUTION ANNEALED (ASTM A 276M, TYPE 304)

(ORDERING DESCRIPTION)

**1 GENERAL:**

This specification governs the quality requirements of Stainless Steel Bars (Austenitic), Solution Annealed to the latest version of ASTM A276M, Type 304 and comply with the following additional requirements.

**2 APPLICATION:**

For application requiring acid, corrosion and heat resistance.

**3 CONDITION OF DELIVERY:**

Cold / Hot rolled and solution annealed. Above 100mm size, forged bars are acceptable. The ends of bars shall be square and true. The bars shall be supplied in straight lengths.

**4 DIMENSIONS AND TOLERANCES:**

Bars shall be supplied to the dimensions specified on BHEL order. The tolerances on length, twist and straightness shall be as per ASTM A484M

**5 CHEMICAL COMPOSITION:**

As per ASTM A276M, Type 304.

**6 TEST CERTIFICATES:**

Three copies of test certificates shall be supplied, unless otherwise stated on the order. In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

BHEL References:

AA10724-Rev. No.08 (ASTM A 276M, Type 304)

Supplier's References:

Name

Identification No.

Melt No.

Details of heat treatment.

Result of Tests:

Dimensional inspection.

Results of chemical analysis, mechanical tests

**Revisions:**

Cl. 32.6.5 of MOM of MRC-S&GPS

**APPROVED:**

INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE – MRC(S&GPS)

Rev No.08

Amd No.

Reaffirmed

Prepared  
HEEP, Haridwar

Issued  
Corp.R&D

Dt. of 1<sup>st</sup> Issue  
June 1978

Dt:01-07-2008

Dt:

Year:2019

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Rev No. 08

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**CORPORATE PURCHASING SPECIFICATION****7 PACKING AND MARKING:**

Bars shall be suitably oiled and packed in boxes to prevent corrosion and damage during transit.

Each bar and flat over 50mm in diameter or width across flats shall be stamped with 'AA10724 Rev 08(ASTM A276M, Type 304)', melt No., BHEL order No., at one end or on the end face.

Bars bar/flat upto and including 50mm in dia./width across flats shall be bundled together and tied with wire at 3 to 4 places along the length of the bars.

A metal label shall be securely attached to each bundle and shall bear the following information:

AA10724 Rev 08 - Solution Annealed ( ASTM A276M, Type 304)

BHEL Order No.

Consignment/Identification No.

Melt No.

Size and Weight.

Supplier's Name.

**FOR INFORMATION ONLY****CHEMICAL COMPOSITION**

C	Si	Mn	Ni	Cr	S	P
≤ 0.08	≤ 1.0	≤ 2.0	8.0-11.0	18.0-20.0	≤ 0.030	≤ 0.045

**MECHANICAL PROPERTIES**

Hardness Max		0.2% PS min N/mm <sup>2</sup>	UTS min N/mm <sup>2</sup>	% El min	% Ra
HBS	HRC				
----	----	205	515	40	50



# CORPORATE STANDARD

AA7111122

Rev No.09

PAGE 1 of 3

## BOLTS, HEXAGON HEAD, PRODUCT GRADE 'A' COARSE PITCH, STEEL PROPERTY CLASS 8.8 (M3 - M16)

### 1.0 DESIGNATION:

A product Gr.A, hexagon head, steel bolt of nominal diameter 10 mm, length 60 mm, coarse pitch and conforming to property class 8.8 shall be designated as:

### 1.1 On Drawings:

- i) Material specification column : AA7111122  
ii) Description Column : BOLT HEX A M10 X 60 – 8.8

### 1.2 On Indents:

Bolt Hex A M10 X 60 – 8.8: AA7111122

### 1.3 For issuing enquiries and on purchase orders:

While issuing enquiries and purchase orders delete BHEL standard number from above description and add the information given under clause 2.0

### 2.0 COMPLIANCE WITH STANDARDS:

#### 2.1 Dimensions, Tolerance & General Requirements:

As per IS 1364 : Part 1 : 2018

#### 2.2 Mechanical Properties:

To conform to property class 8.8, as specified in Table–3 of IS:1367, Part 3  
Permissible hardness 238-350 HB for sizes M6-M10

#### 2.3 Threads:

Pitch-Coarse to IS 4218 : Part 2  
Tolerance quality – Medium  
Tolerance class – 6g

#### 2.4 Identification Marking:

As stated in Clause 10 of IS 1367 : Part 3

#### 2.5 Surface Discontinuity:

As per IS 1367 : Part 9 : Sec 1

#### 2.6 Finish:

Planted as specified in BHEL order.

Revisions:

**APPROVED:**  
INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE – MRC(F)

Rev No.09

Amd No.

Reaffirmed

Prepared

Issued

Dt. of 1<sup>st</sup> Issue

Dt:20-03-2021

Dt:

Year:

HEEP, Haridwar

Corp.R&amp;D

January 1977



### 3.0 NOTE:

- 3.1** Length and diameter combination (refer Table-1 on page 3 of 3) between the bold lines should only be use
- 3.2** For screw threads, general (Metric) refer to BHEL standard AA0231800
- 3.3** For tolerance grade, position and class refer to BHEL standard AA0230201
- 3.4** Bolts to this standard would be un-plated, divisions wishing to have plated bolts would have to get them plated.
- 3.5** Weights given in this standard are for general reference only and are not meant for commercial transaction.
- 3.6** For product group Gr:A, hexagon head, steel bolts, property class 8.8 (M20 - M24) refer BHEL standard AA7111124
- 3.7** When fasteners are to be tested with in BHEL, the sampling and acceptance plan shall be as per IS:1367, part 17

#### 4.0 REFERRED STANDARDS (Latest publications including amendment):

- 1) AA0231800                      2) AA0230201                      3) AA0231850  
4) IS 1367 : Part 3, 9 : Sec 1 & 17    5) AA7111124                      6) IS 4218 : Part 2

### EXPLANATORY NOTE

- In Clause 2.1, year of IS updated to 2018
- In Clause 2.4, clause 10 in place clause 9.
- In Clause 2.5, applicable Section of IS added.

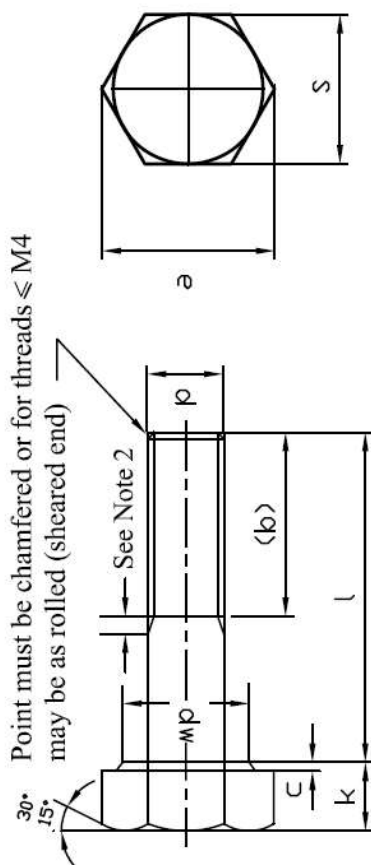


# CORPORATE STANDARD

AA711122

Rev. No.09

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Note:

- 1) Corporate sub codes are shown in the table.
- 2) For thread runoff refer AA0231850
- 3) Weights have been shown in kg per 1000Nos
- 4) Symbol  $\Delta$  denotes the non-preferred size.

All dimensions are in 'mm'

TABLE -1

[illegible]



# CORPORATE STANDARD

AA7164001

Rev. No. 05

PAGE 1 of 3

## WASHERS, SPRING LOCK, SINGLE COIL, RECTANGULAR SECTION, TYPE - A (WITH BENT ENDS) STEEL

### 1 DESIGNATION

A single coil, rectangular section, spring lock washer, Type-A (with bent ends) for right hand threads, of nominal size 5 mm, and made of steel shall be designated as:

#### 1.1 On Drawings

- i) Material specification column: AA7164001
- ii) Description column: WASHER SPRING LOCK SC A 5-ST

#### 1.2 On Indents

Washer Spring Lock A 5- AA7164001

#### 1.3 For issuing enquiries and on purchase orders

While issuing enquiries and purchase orders, delete the corporate standard No, from the above description and add the information given under clause 2.

### 2 COMPLIANCE WITH STANDARDS

#### 2.1 Dimensions, Tolerances & General Requirements

To IS 3063-1994, Type A (Table-1A) Reaffirmed 2010

#### 2.2 Material

Spring steel Gr. 3 to Gr.6 as specified in IS 4072

#### 2.3 Heat Treatment and Hardness

Spring Lock washer after coiling shall be suitably heat treated, so as to result in the finished washer having a hardness in the range of 430 - 530 HV

#### 2.4 Finish

As specified in BHEL order.

Revisions:  
As per clause 33.5.a) of MOM of MRC-Fasteners

**APPROVED:**  
INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE – MRC (F)

Rev. No. 05	Amd. No.	Reaffirmed	Prepared HPEP, Hyderabad	Issued Corp. R&D	Dt. of 1 <sup>st</sup> Issue 01-04-1993
Dt: 14-03-2016	Dt:	Year:			

AA7164001

Rev. No. 05

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**CORPORATE STANDARD****3 NOTE**

- 3.1** For washers spring lock (Type-B) refer corporate standard AA7164002.
- 3.2** Lock washers to this standard would be un-plated, divisions wishing to have plated washers would have to get them plated.
- 3.3** Weights given in this standard are for general reference only and are not meant for commercial transactions.
- 3.4** When the fasteners are to be tested within BHEL, the following sampling plan shall be followed for physical properties.

LOT SIZE	SAMPLE SIZE	ACCEPTANCE No.
Up to 1000	5	0
1001 – 3000	8	0
3001 - 10000	13	0
10000 – 35000	20	0
Over 35000	32	1

**4 Referred Standards (Latest Publications including amendments)**

- 1) AA7164002
- 2) IS 4072

**EXPLANATORY NOTE**

The following changes have been made in this revision:

- Clause 2.1, year of Reaffirmation of **IS** changed as IS 3063-1994, Reaffirmed 2010



## CORPORATE STANDARD

AA7164001

Rev. No. 05

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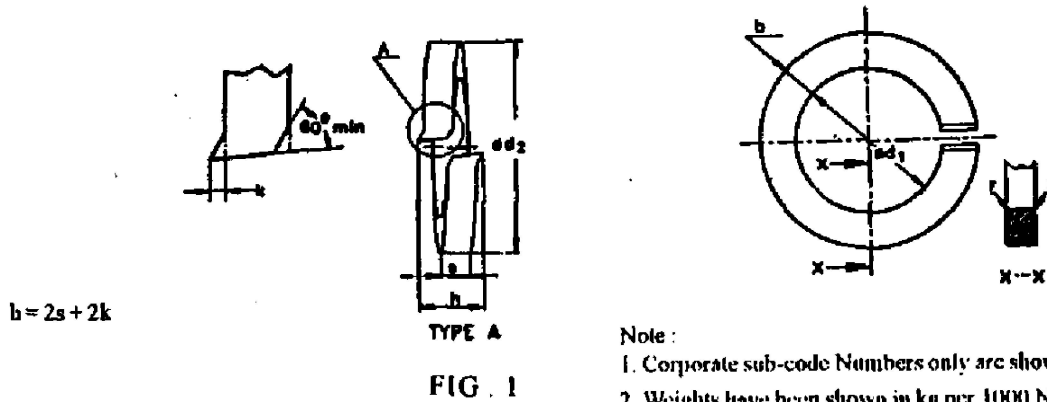


Table 1

All dimensions are in 'mm'

Nom. size	Internal Diameter $d_1$		Outside Dia $d_2$ Max.	Width $b$		Thickness $s$		Radius $r$ Nom.	Bent End $k^*$	For Bolt Nut or Screw Size	Sub code	Weight
	Basic	Tol. +		Basic	Tol. ±	Basic	Tol. ±					
2	2.1	0.3	4.4	0.9	0.1	0.5	0.1	0.1	-	M2		0.033
2.2	2.3	0.3	4.8	1.0	0.1	0.6	0.1	0.1	-	M2.2		0.050
2.5	2.6	0.3	5.1	1.0	0.1	0.6	0.1	0.1	-	M2.5		0.052
3.0	3.1	0.3	6.2	1.3	0.1	0.8	0.1	0.2	0.15	M3	014	0.11
4.0	4.1	0.3	7.6	1.5	0.1	0.9	0.1	0.2	0.15	M4	022	0.18
5.0	5.1	0.3	9.2	1.8	0.1	1.2	0.1	0.2	0.15	M5	030	0.36
6.0	6.1	0.4	11.8	2.5	0.15	1.6	0.1	0.3	0.2	M6	049	0.83
8.0	8.1	0.4	14.8	3.0	0.15	2.0	0.1	0.5	0.3	M8	057	1.60
10.0	10.2	0.5	18.1	3.5	0.2	2.2	0.15	0.5	0.3	M10	065	2.53
12.0	12.2	0.5	21.1	4.0	0.2	2.5	0.15	1.0	0.4	M12	073	3.82
16.0	16.2	0.8	27.4	5.0	0.2	3.5	0.2	1.0	0.4	M16	081	8.91
20.0	20.2	1.0	33.6	6.0	0.2	4.0	0.2	1.0	0.4	M20	090	15.2
24.0	24.5	1.0	40.0	7.0	0.25	5.0	0.2	1.6	0.5	M24	103	26.2
30.0	30.5	1.2	48.2	8.0	0.25	6.0	0.2	1.6	0.8	M30	111	44.3
36.0	36.5	1.2	58.2	10.0	0.25	6.0	0.2	1.6	0.8	M36		67.3
42.0	42.5	1.2	68.2	12.0	0.25	7.0	0.25	2.0	0.8	M42		111
48.0	49.0	1.5	75.0	12.0	0.25	7.0	0.25	2.0	0.8	M48		123
52.0	53.0	1.5	83.0	14.0	0.25	8.0	0.25	2.0	1	M52		182
56.0	57.0	1.5	87.0	14.0	0.25	8.0	0.25	2.0	1	M56		193
60.0	61.0	1.5	91.0	14.0	0.25	8.0	0.25	2.0	1	M60		203
64.0	65.0	1.5	95.0	14.0	0.25	8.0	0.25	2.0	1	M64	120	218

The bend "k" shall be made on the last length of the washer circumference without any sharp angle.



1733816/2023/HEP-TXM20500



# PRODUCT STANDARD

## TME DIVN. BHOPAL

TM 97248

TME 2011

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### Material Specification of Shrink Hose PE 5

#### 1 General

##### 1.1 Scope

This instruction lays down all the requirements which are made for the semi-finished product shrink hose PE 5.

##### 1.2 Description, Definition

Shrink hose PE 5 is an insulating hose made of radiation interlaced (polyethylene-based) polyolefine which shrinks to around 50 % of its original diameter when heated to at least 120 °C. The material has reduced inflammability (contains halogen).

##### 1.3 Product Designation

For semi-finished product	Designation text
Shrink hose	Schr Schl inside dia. x wall thickness - PE 5

##### 1.4 Dimensions

As per order.

##### 1.5 Delivery Documents, Destination For Delivery

As per order.

##### 1.6 Order

The order is the summary of the particulars and regulations that apply to the delivery. BHEL reserves the right to test all the requirements listed, test material for which is included in the order. The order can contain requirements which differ from or supplement instruction (except the section 2.1 "Properties").

##### 1.7 Supplier's Product Designation

Semi-finished product shrink hose PE 5 must receive from the supplier a designation of quality which must be changed if alterations are made to the composition, the quality of the raw materials, the method of manufacture or other factors that could influence the technological properties of the semi finished product.

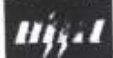
##### 1.8 Acceptance of New Products

Attainment of the properties listed is not in itself sufficient for the acceptance of new, previously unaccepted products. Only if after particular experiments, practical service tests and if necessary, other considerations have been taken into account, it appears that the new product is acceptable and interchangeable, may we decide to adopt the new product.

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Revision Details: As per revision sheet			Distribution	Qty.	Approved (S.P. Singh) 15/02/22 Sr.DGM/TME	
Rev. No.	Date of Rev	Reaffirmed Year	TME TXM TNX QTM	1 1 1 2	Prepared Ashish Tiwari DY.MGR/TME	Checked V.Rawtiya DGM/TME
00	23.06.97	Feb 2022				
						Dt. of 1 <sup>st</sup> Issue 23.06.97



# PRODUCT STANDARD

## TME DIVN. BHOPAL

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### 2 Requirements

#### 2.1 Properties

Code	Size, term	Unit	Values	Test method
01120	Density	g/cm <sup>3</sup>	1.05 ... 1.15	ISO 1183
10200	Specific tensile strength at 23°C in as-delivered condition	km	> 1.0	DIN 40261
11550	Elongation at rupture	%	> 200	section 5.12
26900	Cold-brittleness temperature	°C	< 40	DIN 40621 section 4.7
27150	Thermal stability at 200 °C	h	> 5	ISO 182 (=DIN 53381 part 1 method A)
29601	Oxygen index	---	> 22	ASTM D 2863 ISO 4589
33300	Volume resistivity at 23 °C	cm	> 10 <sup>11</sup>	DIN 40621 section 5.21
35100	Dielectric breakdown voltage in as-delivered condition	kV	> 6	IEC 243 (= DIN 53481)
74450	Shrinkage after 1 hr. at 120 °C Reduction in diameter	---	see section 2.4.1	DIN 40621
	Change in length	%	< 6	section 5.313

#### 2.2 Additional Requirements

A hose section 200 mm long pulled over a mandrel which corresponds to its minimum internal unshrunk diameter (see section 2.4.1 "Dimensions"), must not tear after 1 hour's warm storage at 150 °C.

#### 2.3 Consignment

##### 2.3.1 Form of the Consignment

Single lengths of approximately 1 m or 1.2 m, or in rolls, but not longer than 150 m.

##### 2.3.2 Packing

The individual shipments are to be packed so that no damage can arise during transport.

##### 2.3.4 Identification

Each item of the consignment (bundle, section, mandrel, etc.) must be identified indelibly (e.g. with an adhesive label or an appendage) with the following details: ABB designation text of product and identification number, quantity and eventually batch and test numbers.

- Hose sections shrunk for 1 hour at 120 °C without auxiliary mandrel.

Note: The code numbers in section 2.1 serve as internal functional key and have therefore no significance for the user of the delivery instructions.

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**2.4 Permissible Variations****2.4.1 Dimensions <sup>1)</sup>**

Sizes in mm

Unshrunk Inner - $\phi d_1$		Shrunk <sup>1)</sup> Inner - $\phi d_1$ Wall thickness		
Nominal size	Minimum	Maximum	Minimum	Maximum
1.2	1.15	0.60	0.30	0.50
1.6	1.55	0.80	0.33	0.54
2.4	2.35	1.20	0.40	0.62
3.2	3.15	1.60	0.40	0.62
4.8	4.70	2.40	0.40	0.62
6.4	6.30	3.20	0.52	0.75
9.5	9.45	4.80	0.52	0.75
12.7	12.6	6.40	0.52	0.75
19.0	18.9	9.60	0.65	0.88
25.4	25.3	12.8	0.71	1.07
38.1	38.0	19.1	0.81	1.25
50.8	50.5	25.5	0.92	1.37
76.2	76.0	38.2	1.02	1.50
101.6	101.3	51.0	1.12	1.68

3

**Reference to ABB Standards**

This specification is equivalent to ABB spec H7N02457 calling identification nos. F415788 (P).

1) See page 2

2) Measurement in accordance with DIN 4062, section 5.11



1733816/2023/HEP-TXM20500



TME.2011

# PRODUCT STANDARD TME DIVN. BHOPAL

TM 972 49

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## Material Specification for Silicon Glass Reinforced Hose

### 1 General

#### 1.1 Scope

This instruction lays down all the requirements for the semi-finished product Reinforced Hose Silicon Glass type Si/GI 1.

#### 1.2 Description, Definition

Hose Si/GI 1 is an electrically-insulating hose braided from glass fibres and repeatedly impregnated and coated with silicon rubber (Si).

#### 1.3 Product Designation

For semi-finished product	Designation text
Hose	Inside diameter x wall thickness - Si/GI 1

#### 1.4 Dimensions

See order.

#### 1.5 Delivery Documents, Destination For Delivery

See order.

#### 1.6 Order

The order is the summary of the particulars and regulations that apply to the delivery. BHEL reserves the right to test all the requirements listed, test material for which should be supplied with the delivery against order. The order can contain requirements which differ from or supplement instruction.

(except the section 2.1 "Properties").

#### 1.7 Supplier's Product Designation

The semi-finished product Hose Si/GI 1 must receive from the supplier a designation of quality which must be changed if alternations are made to the composition, the quality of the raw materials, the method of manufacture or other factors that could influence the technological properties of the semi-finished product.

#### 1.8 Acceptance of New Products

Attainment of the properties listed is not in itself sufficient for the acceptance of new, previously accepted products. Only if after particular experiments, practical service tests and if necessary, other considerations have been taken into account, it appears that the new product is acceptable and interchangeable, may we decide to convert to it.

Revision Details: As per revision sheet			Distribution	Qty.	Approved		
Rev. No.	Date of Rev	Reaffirmed Year	TME TXM	1 1	Sr.DGM/TME		Dt. of 1 <sup>st</sup> Issue
00	23.06.97	Feb 2022			Prepared K Dugvekar Dy. Mgr/TME	Checked V.Rawtiya DGM/TME	

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# PRODUCT STANDARD TME DIVN. BHOPAL

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## 2 Requirements

### 2.1 Properties

Code	Size, term	Unit	Values	Test method
	Wall thickness s		see section 2.4.1	
01100	Composition Glass content	Mass-%	< 75	IEC 371-2 section 2.6
	Content of silicon		> 25	
33300	Volume resistance (24 hrs. / 23 °C / 98% RH)	ohm-cm	> 10 <sup>10</sup>	DIN 40620 part 2 section 4.3.1
35200	1-min-test voltage at 23 °C kV <sup>1)</sup> at wall thickness		no breakdown	DIN 40620 part 2 4.3.2
	3	0.5 mm		
	3,8	0.7 mm		
	4,5	1.0 mm		
	6	1.5 mm		
57100	Chemical behaviour resistance to impregnation in standard impregnating agent <sup>2)</sup>		no dissolving, slight swelling permissible	DIN 40620 part 2 section 4.4.1

### 2.2 Additional Requirements

The hose surface must be smooth and free from pores, blisters and inclusions.

### 2.3 Consignment

#### 2.3.1 Form of the Consignment

For inside diameters 0.5 ... 12 mm in coils of 25 m, 50 m, 100 m or 200 m depending on the inside diameter.

For inside diameters ≥ 13 ... 20 mm in individual pieces of 2 m or coils of 25 m and 50 m depending on the inside diameter.

For inside diameters 30 mm and 32 mm in individual pieces of 1 m or 2 m.

OR as indicated in the order.

#### 2.3.2 Packing

The individual shipments are to be packed so that no damage can arise during transport.

#### 2.3.3 Transport

The shipment is to be made by rail or road transport in such a way that it can be unloaded easily

1) Quality S according to DIN 40620 part 3 section 2.3.5

2) According to DIN 40620 part 2 section 4.4.1

#### Note:

The code numbers in section 2.1 serve as internal functional key and have therefore no significance for the user of the delivery instruction.



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### 2.3.4 Identification

Each item of the consignment (coil, piece etc.) must be labelled securely and indelibly (e.g. with an adhesive label or an appendage) with the following details: Specification and Designation text of product, quantity and eventually batch and test numbers.

### 2.4 Permissible Variations

#### 2.4.1 Dimensions

For inside diameter	:	] according to DIN 40620 page 1
For wall thickness s	:	

The dimensions are determined in accordance with DIN 40620 part 2 section 4.1.

3.0 This specification is equivalent to ABB Spec ZN02042 calling identification Nos. NBT401118P..