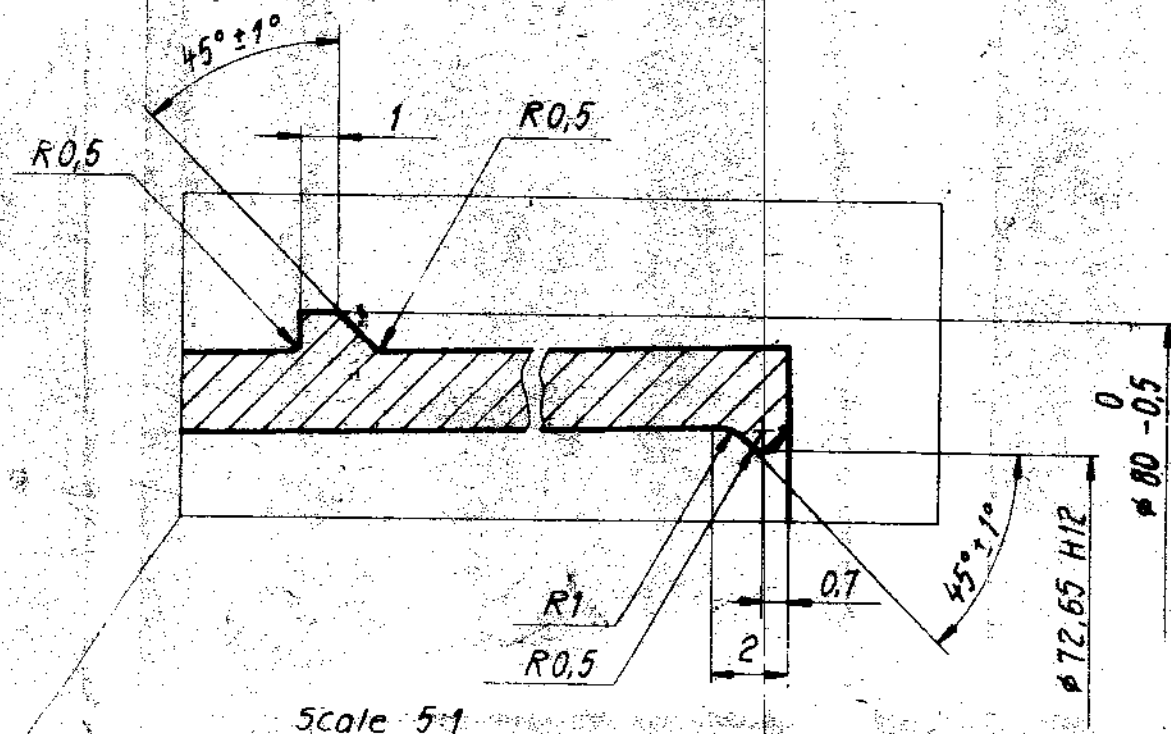


Scale 5:1

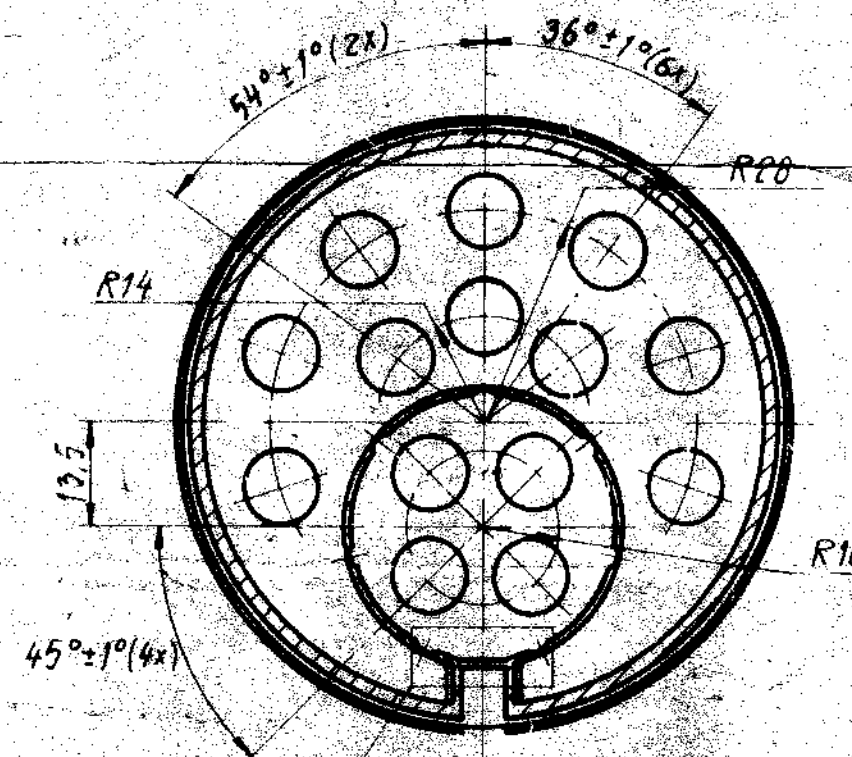


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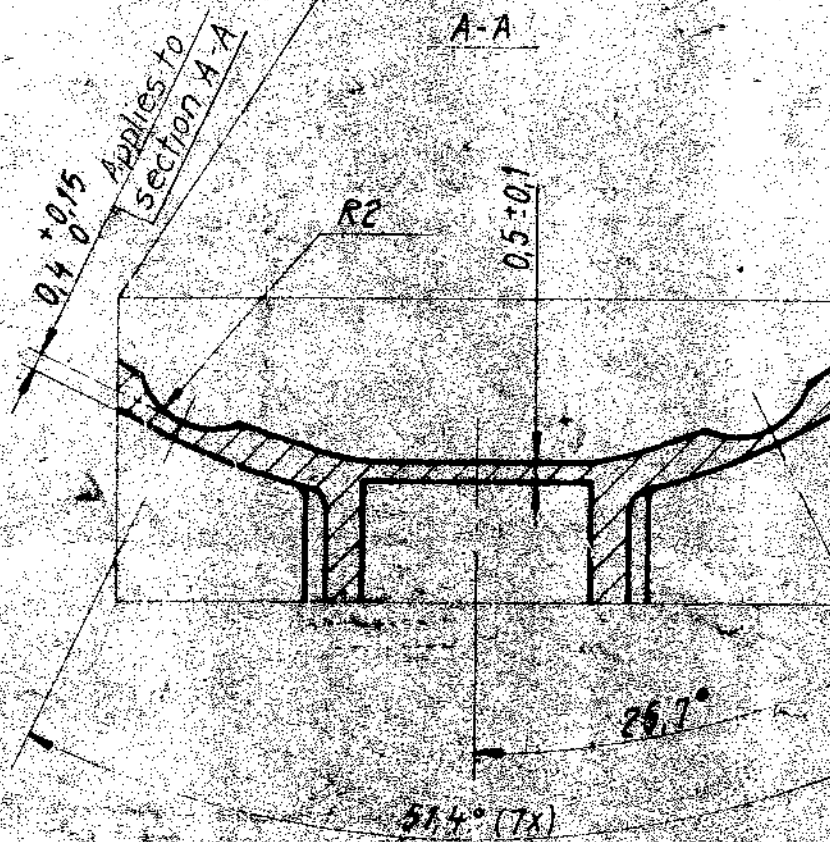
INDIGENOUS MATERIAL

POLYPROPYLENE MATERIAL CONFORMING TO FOLLOWING PARAMETERS:-

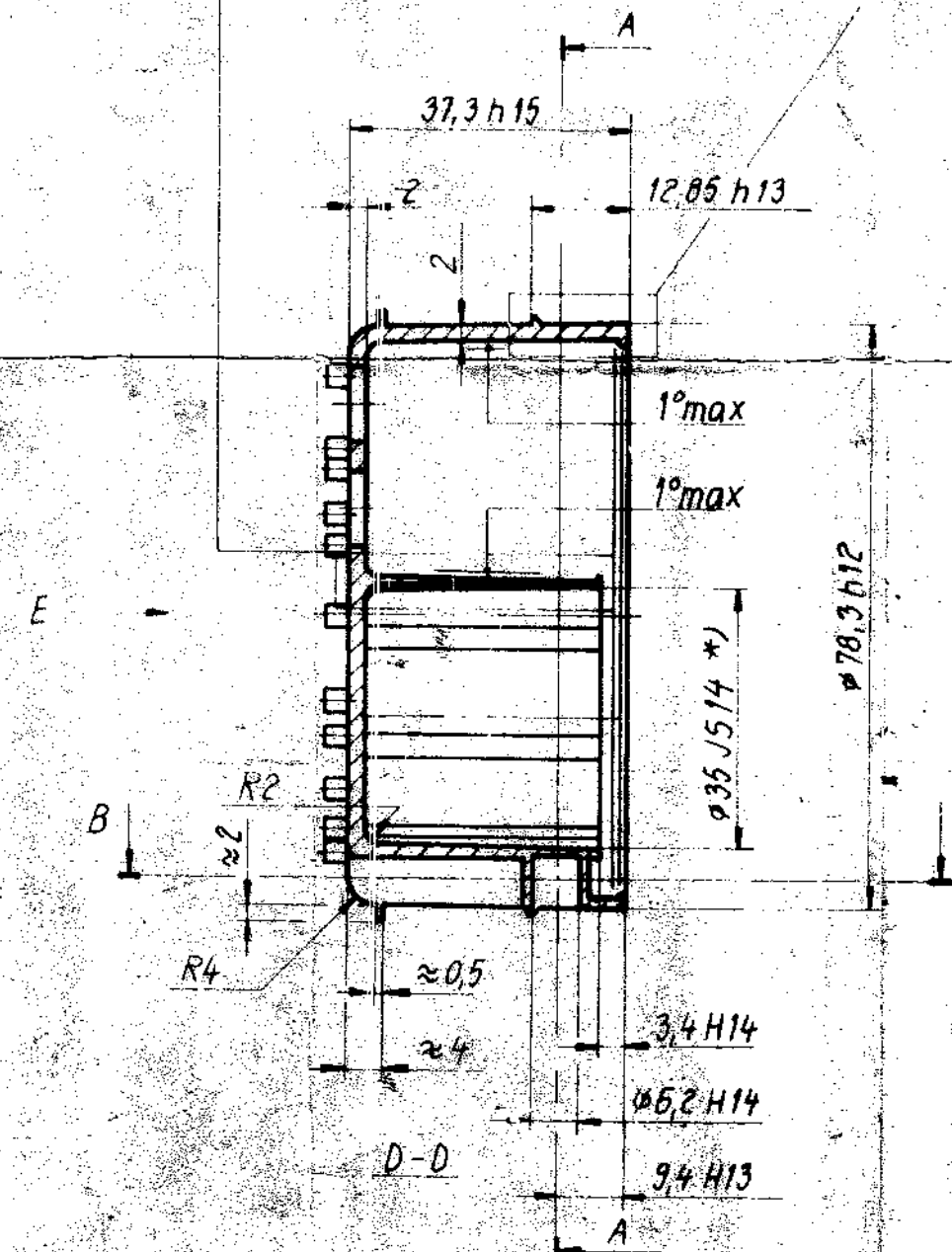
- i) MFI MAX ----- 10 g/10 min
- ii) TENSILE STRENGTH MIN ----- 340 kg/cm²
- iii) IZOD IMPACT (NOTCHED) MIN ----- 5 kg cm/cm
- iv) DENSITY ----- 0.904 g/cm³
- v) ELONGATION AT YIELD % MIN ----- 17



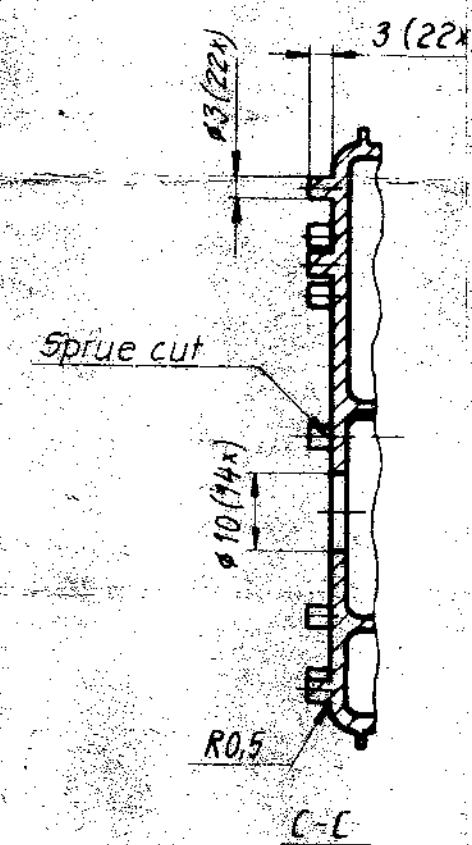
A-A



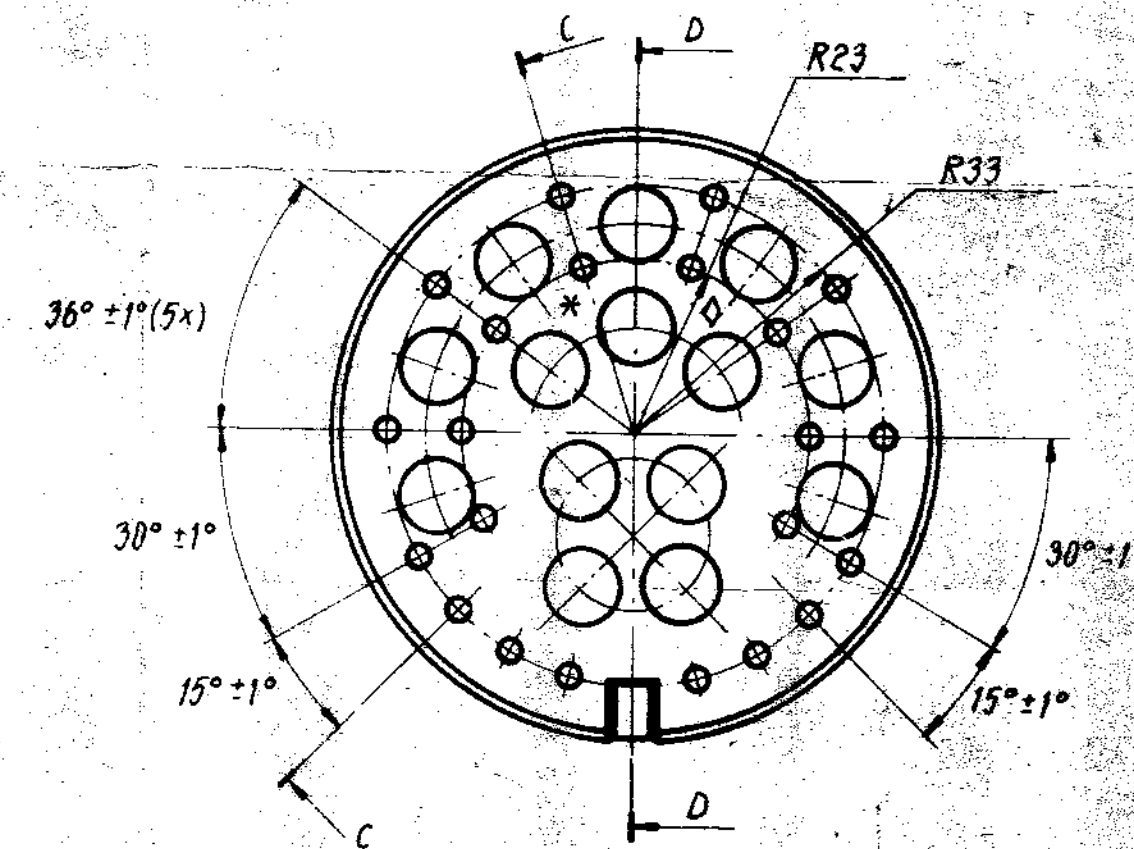
Scale 5:1



B-B



C-C



View E

MARKING

- * CONTRACTOR'S INITIALS OR MONOGRAM
- ◇ DATE OF MANUFACTURE (MONTH/YEAR e.g. 7/89)

* x) for dimension 1/2
*) Applicable only to 3.4 H14

Spec F1301-203000

Rev	Antal	Benämning/Beteckning	Ritning/Referens	Hostalen PPT 3010
10-2-89	DC 31522-A	DRGFORMAT BOX ENTRIES REG. GAUGE SCHD. EST. MASS & COLUMN D.S. CAT		
7-7-88	DC 316436-A	INDIGENOUS MATERIAL AMENDED		
21-10-89	DC 31743-A	MARKING NOTE ADDED & MARKING SHOWN ON VIEW E		
31-12-89	DC 31742-A	INDIGENOUS MATERIAL ADDED		
20-12-88	DC 31507-A	DRG SEALED IN SUPERSESSION OF ISSUE 1.47		
Redrawn: Drawing amended, cf F1301-024351H			10-01-01	FR 1/1/2000
Datum: 10-01-01			FR 1/1/2000	

Rev	Antal	Benämning/Beteckning	Ritning/Referens	Hostalen PPT 3010
10-2-89	DC 31522-A	DRGFORMAT BOX ENTRIES REG. GAUGE SCHD. EST. MASS & COLUMN D.S. CAT		
7-7-88	DC 316436-A	INDIGENOUS MATERIAL AMENDED		
21-10-89	DC 31743-A	MARKING NOTE ADDED & MARKING SHOWN ON VIEW E		
31-12-89	DC 31742-A	INDIGENOUS MATERIAL ADDED		
20-12-88	DC 31507-A	DRG SEALED IN SUPERSESSION OF ISSUE 1.47		
Redrawn: Drawing amended, cf F1301-024351H			10-01-01	FR 1/1/2000
Datum: 10-01-01			FR 1/1/2000	

FFV

Cap

F1301-024351

Utgåva	Ändr nr	Plats på ritning/Beskrivning	Datum	Utförd	Gransk/Godk
D	1-2	Redrawn; C4; B2	83-08-19	LW	#8776
E	1-2	D4; B2;	88-04-21	ML	12 4/8776
27-12-88	D.C. 34511-A	DRG SEALED IN SUPERSESSION OF ISSUE 'D'			(B)
21-10-89	D.C. 34742-A	INDIGENOUS MATL. ADDED.			NA
21-10-89	D.C. 34743-A	NOTE RE-COLOUR CODE ADDED.			NA
28-12-95	D.C. 36056-A	INDIGENOUS MATL. AMENDED			NA
10-2-99	D.C. 36522-A	DRG. FORMAT BOX ENTRIES REG. GAUGE SCHD. & EST. MASS ADDED.			NA

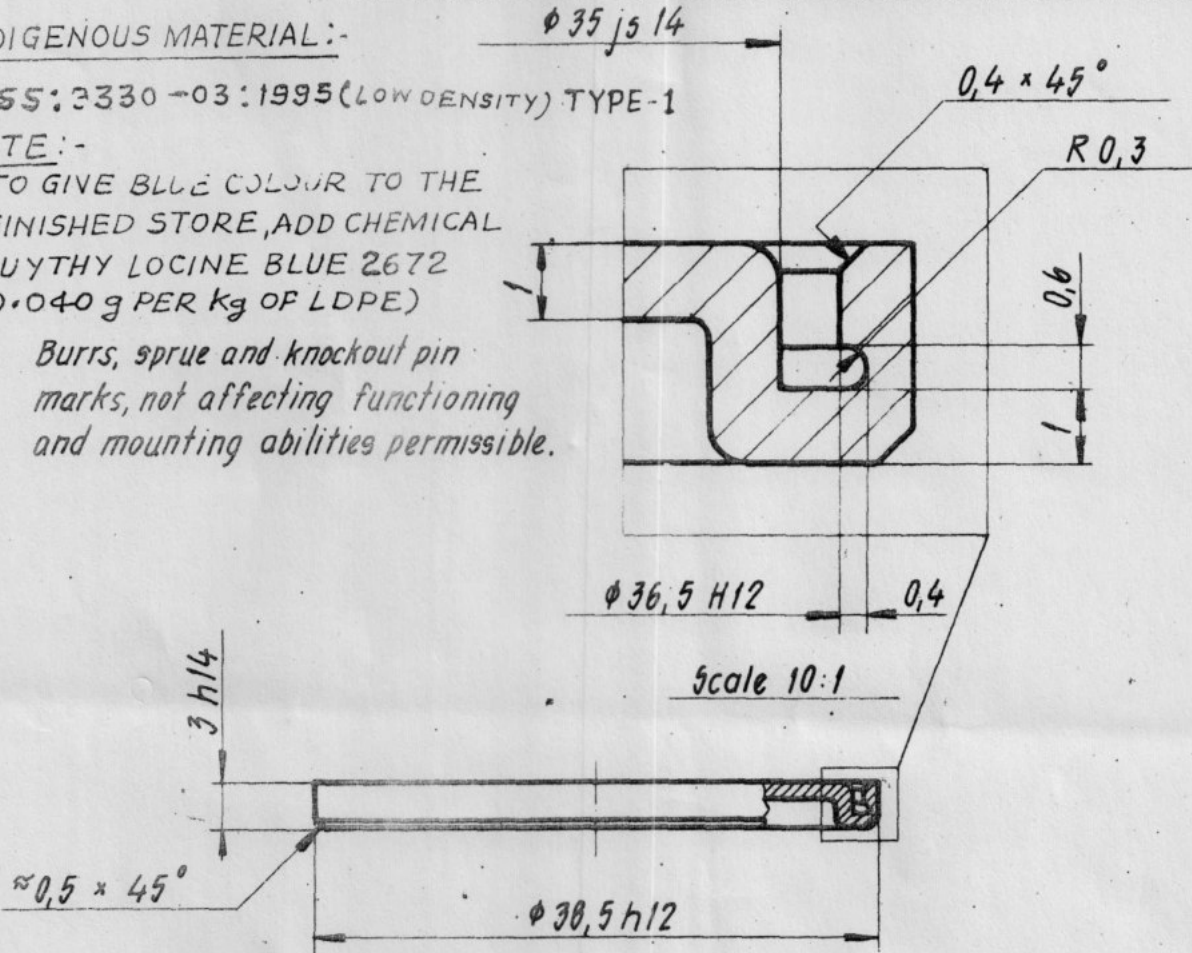
INDIGENOUS MATERIAL:-

J55:3330-03:1995 (LOW DENSITY) TYPE-1

NOTE:-

TO GIVE BLUE COLOUR TO THE FINISHED STORE, ADD CHEMICAL PUYYTHY LOCINE BLUE 2672 (0.040 g PER kg OF LDPE)

Burrs, sprue and knockout pin marks, not affecting functioning and mounting abilities permissible.



Polyethylene LD to Spec F1301-905060				
Det	Antal	Benämning/Beteckning	Ritning/Referens	Material/Övrigt
Där ej annat anges gäller				
Tolerans	± IT 14/2	Ytjämnhet	Gränning R 0,3 eller Fas 0,3 x 45°	Form- och lägestoleranser enl SMS 1920
Konstr/Ritad	L.J./I.P	Ritningsgranskad	B.O	Mått/för eller ytbeh
Datum		Konstruktionsgransk	J.O	Registrerad
		Kontrollerbarhetsgr	Produktionsgranskad	Datum
		Benämning		65-09-02
				GAUGE SCHD:-
				K-1601
				EST. MASS:-
				APPROX 1.09g
				Ritningsnummer
				F1301-029650 E
				Blad

FFV

4 DRG AVAILABLE ON CD

149

1890

1890

149

F.No-149

C. F. C. SECTION
5001/B
10/05-18

गुणता आश्वासन निबंधालय (गोलाबाऊ)
खडकी, पुणे-411003
Controllerate of Quality Assurance (AMN)
Khadki, Pune-411003
प्रमाणित है कि
मुद्रांकित आ. नि. नि. नि. नि.
Certified Control Copy
Sealed Drawing as on
1 SEP 2005
कृते गुणता आश्वासन निबंधालय (गोलाबाऊ)
For Controllerate of Quality Assurance (AMN)

L.N. (ME)/7204/227 (with P-14/1020 ME & REP/XVI) DCNO 3336-ME
 15-9-95
 19/11, ASSC, 15-9-95
 3.2.15... से 87
 Approved by Ministry of Defence
 vide Letter No. 1971/
 Coord/Std Dated...
 Asst. Director
 मानकीकरण विभाग
 Directorate of Standardisation
 रक्षा मंत्रालय, नई दिल्ली
 Min. of Defence No.
 DCNO. 3490-ME
 14-1-98

प्रोड्यूसर/आपेक्शन/विनिर्देश
 प्रमाणित एवं पंजीकृत
 Certified & Sealed
 दिनांक/At Date
 10 SEPT 96
 नं.
 411003
 DR CONTROLLER CQA (ME)
 BIRKEE, PUNE-411 003.

JSS 9330-03: 1995
 Revision No. 1
 (Supersedes JSS 1213 A : Aug 65)

JSS 9330-03: 2007
 (Rev. No. 2)

RAKSHA MANTRALAYA
 MINISTRY OF DEFENCE

* DCNO. - 3909-ME
 21.07.2008

JOINT SERVICES SPECIFICATION

ON

POLYETHYLENE LOW DENSITY, LINEAR LOW
 DENSITY AND HIGH DENSITY

(DS cat NO. 9330 - 000115, 130, 131, 117, 119 resp)

* vide CQA (ME) Letter NO.

CQA (ME) / 7212/61 17 March 2009

JSS 9330 - 03: 2014 (Rev. No. 3)

DC NO. 5292-ME

16.12.2014

* vide CQA (ME) / 7212/63 DT- 17/4/2015

MANAKIKARAN NIDESHALAYA
 RAKSHA UTPADAN TATHA PURTI VIBHAG
 RAKSHA MANTRALAYA, 'H' BLOCK, DHQ PO
 NEW DELHI - 110 011

JSS 9330-03: 2014

(Rev. No. 3)

* DCNO. 5489-ME DT-31.3.16

DIRECTORATE OF STANDARDISATION
 DEPARTMENT OF DEFENCE PRODUCTION & SUPPLIES
 MINISTRY OF DEFENCE, 'H' BLOCK, DHQ PO
 NEW DELHI - 110 011

* vide CQA (ME) / 7212/63
 DT- 26.5.16

Ref con 1070/ME/REP/XVI
 Page 14.

Q. P. C. SECTION	
O. F. KHAMARIA, JAIPUR	
Received on.....	
Order Letter No.....	
File No.....	
By.....	

25
Asstt. Director
गवर्नरी सेवा निदेशावली
Directorate of Standards
एवा मन्त्रालय, नई दिल्ली
Min. of Defence No

JSS 9330-03: 1995
Revision No. 1
(Supersedes JSS 1213 A : Aug 65)

RECORD OF AMENDMENTS

Amendment No. Date	Amendment pertains to: Sl.No./Para No./Column No.	Authority	Amended by Name & Appointment (IN BLOCK LETTERS)	Signature & Date
-----------------------	--	-----------	--	------------------------

3336-ME
15.9.95
JSS 1213-A Aug 65
Revised and
redesignated as
JSS 9330-03:1995

Dte. of std.
new Delhi
letter no.
2806/Amnt/std
dt. 27 April 95
(P32 of C&A(ME)/
7225/18)

File

3490-ME
14-1-98
Page 2, cl. 1.1 & Page 6
cl. 7.4.1, Page 9 after
cl. 11.1

C&A(ME) letter No.
C&A(ME)/7212/57
dt-7-4-98

B. K. Roy
ch/num 1

14/1/98

2
Asst. Director
Directorate of Standards
Min. of Defence No.

JSS 8330-02 : 1975

Revision No.

(Supersedes JSS 1212 A : Aug 65)

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JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 1965)

W. V. S.
Joint Director
Directorate of Standardisation
Ministry of Defence
New Delhi

FOREWORD

1. This Joint Services Specification has been prepared by the Armament Standardisation Sub Committee on the authority of the Standardisation Committee, Ministry of Defence.

2. This specification has been approved by the Ministry of Defence and is mandatory for use by the Defence Services.

3. This specification is revision of JSS 1213 A : Aug 1965 and supersedes the same. This specification also supersedes specifications IND/ME/917(Prov) and IND/ME/918(Prov).

4. This specification would be used for manufacture, supply and quality assurance of Polyethylene, Low Density, Linear Low Density, and High Density.

5. Quality Assurance Authority for the item covered by this specification is the Controller, Directorate of Quality Assurance (Military Explosives), Aundh Road, Kirkee, Pune-411 003. Enquiries regarding this specification relating to any contractual conditions should be addressed to the Quality Assurance Authority named in the tender or contract. Other enquiries should be referred to:-

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, DHQ PO,
New Delhi- 110 011.

6. Copies of this specification can be obtained on payment from:-

The Controller,
Directorate of Quality Assurance (Military Explosives),
Aundh Road, Kirkee, Pune - 411 003.

7. This specification holds good only for the supply order for which it is issued.

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

18/08/95
Asstt. Director
सामग्री तथा निदेशाना
Directorate of Standards
आयुध विभाग, नई दिल्ली
Min. of Defence

1. SCOPE

1.1 This specification is meant to govern manufacture, supply and quality assurance of the following grades of polyethylene:-

- a) Low density polyethylene ~~grade 'A'~~ type 1 for use in the manufacture of sheets, lay flat tubing, bags used for packing ammunition, ammunition components, ammunition chemicals and Explosives and wax special No. 8.
- b) Low density polyethylene ~~grade 'A'~~ type 2 for use in the manufacture of carriers, containers and other moulded components.
- c) Linear low density polyethylene ~~grade 'B'~~ for use in the manufacture of carriers, containers and other moulded components.
- d) High density polyethylene ~~grade 'C'~~ type 1 for use in packing of ammunition components and in the manufacture of washers, sleeves etc used in ammunition.
- e) High density polyethylene ~~grade 'C'~~ type 2 for use in the manufacture of carriers, containers and barmines.

2. RELATED SPECIFICATIONS

2.1 Reference is made in this specification to:-

- | | |
|-----------------------------|--|
| (a) IS 138 : 1992 | Ready mixed paint, marking for packages and petrol containers (third revision) |
| (b) IS 1060 (Part 1) : 1966 | Methods of sampling and test for paper and allied products : Part 1 (revised) (Amendments 4) Reaffirmed 1992 |
| (c) IS 1060 (Part 2) : 1960 | Methods of sampling and test for paper and allied products : Part 2 Reaffirmed 1992 |

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

Joint Director
Director of Standards
Min. of Defence New

- | | |
|--------------------|---|
| (d) BS 2782 Part 3 | Methods of testing plastics,
Mechanical properties |
| (e) BS 2782 Part 6 | Methods of testing plastics,
Dimensional properties |
| (f) ASTM-D 256 | Test Method for impact resistance
of plastics and electrical insu-
lating materials |
| (g) ASTM-D 638 | Test Method for tensile properties
of plastics |
| (h) ASTM-D 648 | Test Method for deflection tempera-
ture of plastics under flexural
load |
| (j) ASTM-D 1238 | Test Method for flow rates of
thermoplastics by extrusion
plastometer |

2.2 Copies of Indian Standards and British Standards are obtainable on payment from :-

Bureau of Indian Standards,
Manak Bhavan,
9, Bahadur Shah Zafar Marg,
New Delhi - 110 002

or

their regional/branch offices.

2.3 Copies of ASTM Standards are obtainable on payment from :-

Americal Society for Testing and Materials,
1916 Race Street,
Philadelphia PA 19103 - 1187 USA.

or

their Official Distributors in India viz.

Book Supply Bureau,
D 44, South Extension-1,
New Delhi - 110 049.

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

10/10/95
Asst. Director
Min. of Defence
Min. of Defence

3. MATERIAL

3.1 Polyethylene Low density, Linear low density and High density shall essentially consist of polymer of Ethylene and shall be free from pigment and plasticisers like Polyisobutylene.

4. MANUFACTURE

4.1 Polyethylene Low density, Linear low density and High density shall be manufactured by a process which will produce the product conforming to this specification.

5. TENDER SAMPLE

5.1 The manufacturer/supplier/contractor shall submit a tender sample of 1 kg of moulding powder essentially from the same batch/lot of manufacture alongwith test specimen for the tests mentioned in clause 7.4 free of all charges and conforming to this specification, to the Quality Assurance Authority/Quality Assurance Officer as stated in the contract.

6. PRE-INSPECTION OF STORES/CONSIGNMENT

6.1 Manufacturers/contractors must satisfy themselves that the stores are in accordance with the terms of the contract and fully conform to the required specification, by carrying out a thorough pre-inspection of each lot before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract. A declaration by the contractor that a necessary pre-inspection has been carried out on the stores tendered, will be submitted along with the challan. The declaration will also indicate the method followed in carrying out pre-inspection showing the features checked/tested and will have the test certificate attached to the challan/declaration.

6.2 If the Quality Assurance Officer finds that pre-inspection of the consignment as required above has not been carried out, the consignment is liable for rejection.

Asst. Director
Directorate of Standards
Ministry of Commerce
New Delhi

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

7. QUALITY ASSURANCE

7.1 Inspection

7.1.1 Polyethylene Low density, Linear low density and High density and the packages in which it is packed shall be subject to inspection by and to the final approval of the Quality Assurance Officer/Quality Assurance Authority.

7.1.2 Samples of the material and of the packages may be taken from any portion of the batch/lot/consignment.

7.2 Sampling

7.2.1 The representative sample of 500 g shall be taken from each package selected for sampling from the batch/lot. The number of packages to be selected to draw the samples from the lot are as under :-

<u>Lot size</u>	<u>No. of containers to be selected</u>
Upto 3	Each container
4 to 15	3
16 to 50	4
51 to 100	5
101 to 300	7
301 to 500	10
501 & above	15


7.3 Criteria for Conformity

7.3.1 If on examination, any sample is found not conforming to this specification, the whole batch/lot/consignment may be rejected.

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Revision No. 1

(Supersedes JSS 1213 A : Aug 65)


Director
Ministry of
Directorate of
Min. of
Min. of

7.4 Test Requirements

7.4.1 Samples taken from any portion of the batch/lot/consignment of material shall conform to clause 3 and in addition shall conform to the test requirements shown in the following tables :-

(a) Chemical Requirements

Sl.No.	Characteristic	Passing Standard			Test Method
		Grade 'A' (Low density)	Grade 'B' (Linear low density)	Grade 'C' (High density)	
(1)	(2)	(3)	(4)	(5)	(6)
(a)	Ash, per cent by mass	Max 0.05	0.05 0.5	0.05	IS 1060 (Part 1) Method 11
(b)	pH of water extract	Min 5 Max 8	5 8	5 8	IS 1060 (Part 1) Method 10
(c)	Water soluble matter, per cent mass	Max 0.2	0.2	0.2	Appendix 'A'
(d)	Water soluble chlorides calculated as Sodium chloride, per cent by mass	Max 0.05	0.05	0.05	IS 1060 (Part 2) Method 17

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

Directorate
Min of Defence

(1)	(2)	(3)	(4)	(5)	(6)
(e)	Water soluble sulphates, calculated as anhydrous Sodium sulphate, per cent by mass	Max 0.1	0.1	0.1	IS 1060 (Part 2) Method 18
(f)	Solubility in Toluene at $80^{\circ}\text{C} \pm 1 \text{ degC}$	Soluble	Partially soluble	Insoluble	Appendix 'B'
(g)	Extractable matter in Toluene at $25^{\circ}\text{C} \pm 1 \text{ degC}$, per cent by mass	Max 6.0	6.0	-	Appendix 'C'
(h)	Solubility in Ethyl acetate, Acetone at $25^{\circ}\text{C} \pm 1 \text{ degC}$	Insoluble	Insoluble	Insoluble	Appendix 'D'
(j)	Effect of organic solvents	Resistant below 60°C	Resistant below 60°C	Resistant below 80°C	Appendix 'E'

(b) Physical Requirements

Sl. No.	Characteristic	Passing Standard			Test Method
		Grade 'A'	Grade 'B'	Grade 'C'	
		(Low density)	Linear low density	High density	
		Type		Type	
		1 2		1 2	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-----	-----	-----	-----	-----	-----	-----	-----

(a) Melt flow index 2 \pm 20% 2 \pm 20% - 8 \pm 20% ASTM-D-1238

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Revision No. 1

(Supersedes JSS 1213 A : Aug '65)

14/12/75
Asst. Director
राज्यीय निदेशक
Directorate of Standards
एन. ए. बंगला, नई दिल्ली
Min. of Defence & A.S.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(b) Density g/ml							
	Min	0.910	0.918	0.916	0.941	0.955	BS 2782 Pt 6
	Max	0.925	0.922	0.920	0.965	0.959	Method No. 620A
							: 1991
(c) Yield stress, <i>Strength at Break</i>							
	MPa	Min	7	12	20	21	23
							BS 2782 Pt 3
							Method 320 A
							: 1976 (1986)
(d) Elongation %							
	at yield	Min	90	560	500	15	10
							- do -
(e) Impact strength (Notched) in MJ/mm ²							
	Min	-	-	-	-	2.7	ASTM-D 256
							Method A
*(f) Melting temperature, °C							
	Min	98	98	122	128	128	-
	Max	115	115	124	133	133	-
*(g) Tensile modulus in MPa							
	Min	98	98	350	530	530	ASTM-D-638
*(h) Heat deflection temperature at 4.6 kg/cm ² load, °C							
	Min	60	60	68	83	83	ASTM-D-648

*Note :- i) The tests mentioned at Sl. No. (f), (g) & (h) are for information only. The limits for the same will be finalised after generation of data.

ii) The width of specimen for yield stress and elongation should be 6 mm and rate of traverse of the machine while testing should be 50 mm/minute.

8. WARRANTY

8.1 The stores supplied against the contract shall be deemed to be warranted against defective material and performance by the contractor for a period of 12 months from the date of receipt of the stores at the consignee's end and if during this period any of the stores supplied is found defective, the same shall be replaced by the manufacturer, supplier or contractor free of all charges at the consignee's premises.

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

Asst. Dir.
Directorate of
Stores, P.
Min. of Defence

9. PACKAGING

9.1 The packaging shall be in accordance with the terms of the contract or as agreed to between the purchaser and contractor :-

10. MARKING

10.1 All the packages containing the material shall be indelibly and legibly marked with the following details :-

- i) Nomenclature of the store and specification number
- ii) Name and address of the consignee
- iii) A/T or S.O. No. and date
- iv) Consignment No.
- v) Lot/Batch No. and date of manufacture
- vi) Gross and net mass
- vii) Consecutive No. of package and total No. of packages in the consignment
- viii) Date of supply
- ix) Contractor's initials or recognised trade mark

10.2 In addition to above, the Quality Assurance Officer may suggest some more markings/identifications suitable at the time of inspection.

10.3 The paint used for marking should conform to IS 138.

11. SAFETY OF OPERATIONS

11.1 Nothing in this specification shall relieve the manufacturer/supplier/contractor/user of his responsibility for the safety of operations in manufacture, storage, transit or use of the store.

11.1 See Slip attached.

11.A DEFENCE STORES CATALOGUE NUMBERS DC.NO. 3490-ME
14-1-98

11A.1 Defence stores catalogue numbers
 allotted to the stores are as under:-

<u>Nomenclature</u>	<u>D.S.CAT.NO.</u>
Polyethylene Low Density Type 1	9330-000115
Polyethylene Low Density Type 2	9330-000131
Polyethylene Linear Low Density	9330-000130
Polyethylene High Density Type 1	9330-000117
Polyethylene High Density Type 2	9330-000119

11.A DEFENCE STORES CATALOGUE NUMBERS DC.NO. 349C-MC
14-1-98

11A.1 Defence stores catalogue numbers
 allotted to the stores are as under:-

Nomenclature

D.S.CAT.NO.

Polyethylene Low
 Density Type 1

9330-000115

Polyethylene
 Low Density Type 2

9330-000131

Polyethylene
 Liner Low Density

9330-000130

Polyethylene
 High Density Type 1

9330-000117

Polyethylene
 High Density Type 2

9330-000119

सहायक निदेशक
असि. निदेशक
सामान्य विभाग
Directorate of Standards
रक्षा मंत्रालय, नई दिल्ली
Min of Defence No

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

12. SUGGESTIONS FOR IMPROVEMENT

12.1 Any suggestion for improvement in this document may be forwarded to :-

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, DHQ PO,
New Delhi - 110 011.

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

Directorate
Min of Defence

APPENDIX 'A'

A. PREPARATION OF AQUEOUS EXTRACT AND ESTIMATION OF WATER SOLUBLE MATTER, CHLORIDES AND SULPHATES

A.1 Cover 10 g of sample, cut to small pieces passing through 200 micrometre IS sieve, with 100 ml of boiling distilled water. Allow to stand in a stoppered conical flask for 1 hour with occasional shaking. Filter through No. 1 Whatman filter paper. Evaporate 25 ml of the above solution in a previously cleaned, dried and weighed glass evaporating dish (M1). On sand bath, keep the dish at 100°C for 30 minutes. Cool in a desiccator and weigh (M2).

$$\text{Water soluble matter \%} = \frac{(M2-M1) \times 100 \times 100}{\text{Mass of the sample taken} \times 25}$$

A.2 Using the remaining extract, estimate chlorides and sulphates as per method 17 and method 18 of IS 1060 (Part 2) respectively.

APPENDIX 'B'

B. SOLUBILITY IN TOLUENE AT 80°C ± 1 degC

B.1 Samples shall be tested at 80°C ± 1 degC with Toluene. Three samples of the material 1.5 g each shall be accurately weighed. These are transferred to three Erlenmeyer flasks of 125 ml capacity. To each sample shall then be added 60 ml of Toluene. The flasks shall then be closed with ground glass stoppers or with rubber stoppers wrapped with Aluminium foil to eliminate any effect of Toluene on the rubber. The mixture shall be stored for 16 hours at 80°C ± 1 degC. The solubility of polyethylene in Toluene at 80°C ± 1 degC shall be observed at this temperature. The polyethylene shall be classed as soluble in Toluene at 80°C if a clear, homogenous solution with no undissolved residue is obtained.

JSS 9330-08 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

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Asst. Director
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Directorate of Standards
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Min of Defence New

APPENDIX 'C'

C. EXTRACTABLE MATTER IN TOLUENE AT $25^{\circ}\text{C} \pm 1 \text{ degC}$

C.1 Polyethylene - Toluene mixture from Appendix 'B' shall be allowed to cool to $25^{\circ}\text{C} \pm 1 \text{ degC}$. It is advisable not to accelerate the cooling operation. The solution shall be filtered through a sintered glass crucible (G-3) which has been previously treated in order to remove any Toluene soluble material and to bring it to constant mass by heating at $50^{\circ}\text{C} \pm 1 \text{ degC}$ (M2). The solution shall then be transferred to the tared crucible and suction applied to hasten the filtration followed by rinsing of flask with Toluene three times using 15 ml of Toluene each time. After the transfer and rinsing are complete, the final traces of Toluene are completely removed by applying suction.

C.2 The crucible shall then be heated in an oven at $50^{\circ}\text{C} \pm 1 \text{ degC}$ to constant mass (M3). During the period when crucible and/or residue is not being heated or weighed, it shall be kept in a desiccator with anhydrous Calcium chloride as desiccant.

C.3 The per cent extractable matter in Toluene shall be calculated by the following formula:-

$$\text{Per cent insoluble matter} = \frac{(M3 - M2)}{M1} \times 100$$

$$\text{Per cent extractable matter} = 100 - \text{per cent insoluble}$$

Where M1 = The mass of the sample taken for test for Solubility at $80^{\circ}\text{C} \pm 1 \text{ degC}$ in Toluene at Appendix 'B'

C.4 If the value is less than 6.0%, the material shall be considered insoluble at 25°C in Toluene and also to have complied with the requirement for extractable matter.

Asst. Director
Directorate of Standards
Min. of Defence No.

JSS 9330-03 : 1995

Revision No. 1

(Supersedes JSS 1213 A : Aug 65)

APPENDIX 'D'

D. SOLUBILITY AT $25^{\circ}\text{C} \pm 1^{\circ}\text{degC}$ IN ETHYL ACETATE, ACETONE

D.1 1.5 g of sample is stored with Acetone and Ethyl acetate separately at $25^{\circ}\text{C} \pm 1^{\circ}\text{degC}$ for 20 hours with approximately 60 ml of reagent. The solubility shall then be observed by evaporating the solvent or visually.

APPENDIX 'E'

E. EFFECTS OF ORGANIC SOLVENTS

E.1 Immerse a piece of the sample (weighed quantity if in powder form) in an organic solvent (normally Toluene or Ethyl acetate or Amylacetate and in special cases if required, Methanol, carbon tetra chloride or dioxine) and maintain at the required temperature (60°C for grades A & B, low density and linear low density polyethylene and 80°C for grade C, High density polyethylene) for 1 hour. Take out the sample and examine it visually. The sample shall not become soft or deformed or no appreciable portion of it shall dissolve in the solvent.

Q. P. C. SECTION
O. P. KHAMARIA, JABALPUR
Received on.....
Under Letter No.....
Bill No.....
Dated.....

FFVComponent parts of plastic in
84 mm ammunition

No.

F1301-905060 (N)

Sheet

1 (7)

Issue	Date	Prepared/ Checked	Approved/ Proposal No.	Issue	Date	Prepared/ Checked	Approved/ Proposal No.
N	88-03-31	UN	10636				
P	9101-07	UBA	12618				

Translated from Swedish/KT

1. RELEVANT DOCUMENTS

In addition to this specification in the order stated below:

AQL-tables, descriptions of method etc.

Detail drawings according to the following.

Sampling procedures and tables for inspection by attributes
MIL-STD-105D or SS 02 01 30.

Drawing No.	Detail	Material	Designation
F1301-024351	Cap✓	Polypropylene	Hostalen PPT 1070
-029650	Bottom	Polyethylene LD	Stamylan 1738 A
-029651	"	"	"
-055804	Crystal retainer	Polycarbonate	Makrolon 2800 or 2805
-055820	Aft closure insulator	Reinforced ester plastic	ASE PREG SS 30
-060802	Ballistic cap	Polyamide	Maranyl A 790, 40 % glass balls
-061591	Contact piece retainer	Polycarbonate	Makrolon 2800 or 2805
-061911	Protective cover	"	"
-061920	Insulator	"	"
-065780	Sliding washer	"	Makrofol DE
-068491	Nose plug	Polypropylene	Polypropylene 4160
-068661	Counterpressure ring	Polycarbonate	Makrolon 8030
-083420	Contact sleeve	"	Makrolon 2800 or 2805
-083960	Housing	"	"
-119690	Top	"	"
-141000	Cap (Round 597)	Polypropylene	Hostalen PPT 1070

Issue	M	N	P									Appendix	No.	F1301-905060
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2 DESCRIPTION OF PRODUCT

The above mentioned details are included in 84 mm ammunition. All the details are vital parts and thus the physical properties are essential to the functioning of the shell.

3 PRODUCT REQUIREMENTS

3.1 MATERIAL

3.1.1 General

The details shall be manufactured of the material stated in the respective drawing. The material is chosen, among other things, with regard to strength and compatibility in relation to surrounding materials such as explosives, other plastics and adhesives, and thus the material composition must not be changed without the purchaser's consent.

3.1.2 Physical properties

The material shall meet the following requirements:

(The property values stated below (target values) are taken from the data sheets of the respective manufacturer and only apply provided that the stipulated test methods are used. The properties of the plastics depend on many factors such as temperature, humidity of the air and time of exposure to load. Therefore, the property values must not be used as basic data for design purposes (with the exception of density).

Issue	M	N	P									Appendix	No.	F1301-905060
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3.1.2.1 Polycarbonate "Makrolon 2800 or 2805, uncoloured, Makrolon 8030 and Makrofol DE, "uncoloured".

Property	Method DIN	Unit	Requirement for type		
			2800/2805	8030	DE
Glass fibre percentage		%		30	
Density	53 479	g/cm ³	1.20	1.44	1.20
Tensile strength	53 455	MPa	> 65	70	80
Elongation on rupture	53 455	%	> 110	3.5	100
Bending strength	53 452	MPa		130	
E-modulus	53 452	MPa	2300	5500	
Notch impact toughness +23 °C	53 453	kJ/m ²	> 30	6	
Hardness, Rockwell	53 456	N/mm ²	110	145	

3.1.2.2 Polyamide "Maranyl A 790, black", 40 % glass balls

Property	Method ISO	Unit	Requirement
Density	R 1183	g/cm ³	1.46
Tensile strength	R 527	MN/m ²	90
Elongation on rupture	R 527	%	3
E-modulus (bending)	R 178	MN/m ²	4900

3.1.2.3 Polyethylene LD "Stamylan 1738 A, uncoloured".

Property	Unit	Requirement
Density	g/cm ³	0.917
Yield strength	N/mm ²	9
Elongation on rupture	%	300
E-modulus	N/mm ²	200
Plasticization point	°C	83

Issue	M	N	P									Appendix	No. F1301-905060
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3.1.2.4 Polypropylene "PPT 1070, uncoloured"

Property	Method	Unit	Requirement
Density	DIN 53 479	g/cm ³	0.907
Tensile strength	DIN 53 455	N/mm ²	35
Yield strain	ISO R 527	%	12
Impact strength in +20 °C	DIN 53 453	mJ/mm ²	no rupture
Bending strength	DIN 53 452	N/mm ²	50
Hardness, "30-sec Wert"	DIN 53 456	N/mm ²	70

3.1.2.5 Polypropylene "4160, black"

Property	Method	Unit	Requirement
Density	DIN 53 479	g/cm ³	0.905
Tensile strength	DIN 53 455	N/mm ²	35
Impact toughness (notched)	DIN 53 453	mJ/mm ²	7
Hardness, "30-sec Wert"	DIN 53 456	N/mm ²	70

3.1.2.5 Glass-fibre-reinforced ester plastic "ASE PREG SS 30, uncoloured"

Property	Method	Unit	Requirement
Colour			Greyish-brown
Density	ISO R 1183	g/cm ³	1.8
Ultimate strength	ISO R 527	N/mm ²	min. 90
Bending rupture limit	ISO R 178	N/mm ²	min. 160
E-modulus, bending	ISO R 173	KN/mm ²	min. 90
Pressure rupture limit	ISO R 604	N/mm ²	min. 270
Impact toughness, Izod	ISO R 180	J/cm	min. 7
Service temperature		°C	max. 120

Issue	M	N	P											Appendix	No.
															F1301-905060
3.2															
SURFACE QUALITY AND DIMENSIONS															
3.2.1															
<u>General</u>															
3.2.1.1															
All the properties apply after the detail has reached continuity (min. 48 h after manufacture).															
3.2.1.2															
The details shall, where special requirements are not stated in the drawing stated in para 1, have the surface quality which is customary for details of this type.															
3.2.1.3															
Dimensions with general tolerances to be inspected by means of sampling. The purchaser shall be informed about deviations occurring to make the decision as to how to proceed.															
3.2.1.4															
Dimensions with direct tolerances, not stated in AQL table, have AQL 6.5 % for individual property.															
3.2.1.5															
For number of defective details the AQL is 6.5 %. Defective detail to be calculated as one defect only even if it has several defects.															
4															
<u>MANUFACTURE</u>															
4.1															
PLANNING AND FOLLOW-UP															
4.1.1															
<u>Division into lots</u>															
The details shall be divided into lots of approx. 5 000 or multiples thereof. Details, which have been manufactured before tools and other equipment has reached proper manufacturing conditions, must not be delivered.															

Issue	M	N	P									Appendix	No.	F1301-905060
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5 DELIVERY

5.1 PACKING

The details shall be packed in a suitable packing so as to prevent damages from occurring during storage and transport. Special attention shall be paid to making sure that deformation does not occur in the details.

5.2 MARKING OF PACKING

Each unit of the packing shall be marked with the name of the product, the drawing number of the purchaser with valid issue letter, stock designation, quantity and lot designation.

6 INSPECTION

6.1 VENDOR'S INSPECTION

6.1.1 The vendor shall perform inspection to the extent necessary in order to verify that the requirements according to this specification are met.

6.1.2 When there is a deviation, a deviation routine agreed upon between purchaser and vendor shall be followed.

6.2 CERTIFICATES

6.2.1 The vendor's inspection shall be accounted for in test certificates to the extent which is agreed upon between the purchaser and the vendor. The certificate shall show that the lot has been inspected and approved by the vendor.

6.2.2 Certified copies of certificates of sub-contractors shall be delivered to the purchaser. The certificate shall apply to all the requirements stated for the material.

Issue	M	N	P									Appendix	No.
													F1301-905060
6.3													PURCHASER'S INSPECTION
6.3.1													The purchaser is entitled to be present at and to follow the vendor's manufacture and inspection.
6.3.2													The purchaser shall perform acceptance inspection on each delivery lot to the extent which is judged to be necessary.
6.4													TEST METHODS
6.4.1													Material testing to be performed according to customary methods.
6.4.2													Dimensional inspection to be carried out according to methods approved by the purchaser.
6.4.3													Inspection regarding critical stresses in the details of Polycarbonate to be performed by submerging for 5 minutes in a solution consisting of
													Toluene 1 part by volume
													Normal-propanol 3 parts by volume
													The test to be performed continuously during manufacture.
6.5													OUT-TURN SAMPLE
													Before starting series manufacture, out-turn samples, at least 20/detail shall be delivered to the purchaser for acceptance. The results of the out-turn sample shall decide the size of the first delivery lot.
7													<u>OTHER CONDITIONS</u>
7.1													A proposal for packing shall be prepared by the vendor and shall be submitted to the purchaser for approval.