DRAFT PRODUCT CERTIFICATION MANUAL FOR COMMENTS

Our Ref.CRO 22 / GZO 12 Dec 2013

Please find enclosed the following draft certification manual :

HIGH DENSITY POLYETHYLENE PIPE FOR SEWERAGE

Kindly examine the draft product certification manual and forward your comments on the draft manuals.

Last date for comments: 30 Dec 2013.

Comments, if any, may please be made in the format as given below and mailed to GZBO at the following email id: gzo@bis.org.in.

Sl. No.	Name of RO / BO	Clause/ Sub-clause	Paragraph / Figure / Table	Type of comment (General / Technical / Editorial)	Comments	Proposed Change

Note: Separate sheets may be attached incase comments are lengthy and cannot be incorporated in the table.

Product Manual On

HIGH DENSITY POLYETHYLENE PIPE FOR SEWERAGE

IS 14333 : 1996

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Amendment Sheet

FOREWORD

The product certification scheme of Bureau of Indian standards, now under Bureau of Indian Standards Act 1986, is in operation for more than 4 decades covering a wide variety of products. The wide experience in the area has brought a fair amount of rationalization in the certification process. This has resulted in the formulation of Operation Manual for product certification prescribing rules and practices generally applicable to all products. Product related rules/guidelines are periodically issued to cover the specific requirements of different products. Still in view of widespread of certification operations, differences are found in application of these guidelines in BIS certification offices in different parts of the country. This manual has been prepared to ensure uniformity in the certification practices in respect of “HIGH DENSITY POLYETHYLENE PIPE FOR SEWERAGE” as per IS14333. In this manual useful information relating to product characteristics, design aspects, limitation and constraints in its use are included. This manual takes into consideration the generally acceptable practices.

Table of Contents

Section I: Product Description

1. Description Of The Product

Polyethylene is strong, extremely tough and very durable. It ensures long service, trouble-free installation, flexibility, resistance to chemicals and a myriad of other features.

Piping made from HDPE is a cost effective solution for a broad range of sewerage piping problems. They ideally have zero leak rate, high performance, and long life expectancy. They are manufactured in black color to identify their application.

HDPE pipes can be used for gravity and low pressure sewerage and drainage purposes such as waste water, sanitary sewer and storm sewerage for municipal or industrial use.

HDPE pipes for Sewerage show their maximum leak free performance if they are passed with BIS standards and are installed using qualified heat fusion procedures and leak free joints which are as strong as the pipe itself.

The pipes provide following important benefits and distinct advantages for sewer and drainage applications.

- Lightweight
- Flexible
- Easy Installation
- Chemical and Abrasion Resistant
- Hydraulic Efficiency
- Tough Structural Performance

Some of the key aspects of HDPE pipes for sewerage are:

- They are formulated with a minimum of 2.5+-0.5% carbon black for maximum protection against UV rays for added assurance.
- Reduced installation cost:

- HDPE is lightweight, flexible, and comes in long lengths, allowing for easier and convenient installation. Because of its flexible nature, it reduces the use of fittings. These can be joined by various heat fusion methods.

- These pipes resist growth of bacteria, algae and fungi. Its strength and resilience provide long term life against both Internal pressure and intermittent surge and water hammer.
- Corrosion Resistance: HDPE pipe has excellent corrosion resistance against electrolytic or galvanic corrosion or any known corrosive soil or water condition.

2. Latest Indian Standard Number with Product Title and Number of Amendments

2.1 Latest Indian Standard Number

Latest Indian Standard Number : IS 14333 : 1996

2.2 Product Title

Product: HIGH DENSITY POLYETHYLENE PIPE FOR SEWERAGE

2.3 Number of Amendments Issued

Number of Amendments Issued: 4

3. List of referred Indian standards for Raw Materials/Components and Test Methods

IS No.	Title

2530 : 1963	Method of test for polyethylene moulding materials and polyethylene compounds
7328 : 1992	High density polyethylene materials for moulding and extrusion

4. Checklist for submission of an application for grant of license

LIST OF DOCUMENTS TO BE ATTACHED WITH APPLICATION		
No.	**Title of Document**	**Page No.**
1	Check-list (***Please see Annex B***)	
2	In case the application is filed under "simplified Procedure", the test report(s) in original from BIS or its recognized laboratories for all the requirements of the product and, where applicable, of raw material(s)/ component(s)	
3	Document of Central/State Government (e.g. Registration Certificate, Memorandum of Articles, etc) authenticating the address and purpose of the establishment of the manufacturing unit for which the application is made for grant of licence.	
4	In case the applicant applies as SSI unit, copy of valid Registration Certificate from the Local / State authority or from a Chartered Accountant?	
5	In case the application is signed by the authorized signatory of the applicant, authorization letter from CEO in the name of the authorized signatory.	
6	Process Flow-chart covering all processes of manufacture (from raw material to finished product stage), including details of in-process controls at each stage, even for those stages which have been outsourced?	

7	Complete list of manufacturing machinery, clearly indicating the name of the machinery, the details of the process for which it is used, its capacity and quantity in **Annex A-1**.	
8	In case some of the manufacturing processes are outsourced, provide details of such processes and the controls exercised by you before receipt of such material/components, etc. Also attach an authenticated copy of the agreement.	
9	Complete list of testing facilities, clearly indicating the name of the equipment, the test for which it is used (mention clause No. of the Indian Standard), range / least count / accuracy of the test equipment, calibration status and quantity in **Annex A-2**. **Note:** *Model lists of testing facilities for some of the Indian Standards already covered under product certification are available on the BIS website and may be referred. However, for other Indian Standards, you are advised to study the relevant Indian Standard(s) and / or contact the concerned Branch Office of BIS for guidance*.	
10	Copies of calibration certificates of testing equipment valid at least till 3 months of acceptance of application	
11	Where applicable, 'consent letter' from BIS recognized laboratory (for requirements which have got to be and / or are proposed to be got tested from outside lab for which the applicant does not have in-house test facilities).	
12	Plant Layout clearly indicating location of manufacturing machinery, lab, office, workshop, amenities, storage area, etc., available in the factory premises, with the application?	
13	Appointment letter of QC personnel indicating names, experience, qualifications, date of appointment and also attach a copy each of the qualification certificates	
14	Copy each of the test reports/suppliers' test certificates for each of the raw materials / components.	
15	Copy of in-house or independent test report for the product covering all requirements as per the relevant Indian Standard	
16	In case application is under simplified procedure, an undertaking from the applicant on his letter-head (see **Annex A-3**) that the licence if granted to him shall be put under Stop Marking by BIS if the verification sample(s) drawn during verification visit of the BIS officer prior to grant of licence fail to conform to the Indian Standard. In case the licensee does not take corrective actions, informs BIS and offers two improved lots to BIS for inspection and testing	

	within one month of the date of Stop Marking, the licence shall be processed for cancellation and no further chance would be given to the licensee	

CMPF 305

ANNEX A-1
(Sl. No. 7 on the List of Documents)

DECLARATION REGARDING MANUFACTURING MACHINERY

1. Applicant name:_____
2. Application No. _____
3. Name/Address _____

Date	Machinery	Make	Capacity	Number	Remarks

I hereby declare that the machinery of which details are given overleaf is owned by me and are actually installed in the premises*. I also declare that in case of grant of licence , I will send prior intimation to BIS whenever any machinery is taken out of the premises of the firm due to any reason Sig. of Firm's Representative _____ Name:_____ Designation:_____ Date _____	I have checked and found that machinery of which details are given overleaf was available during my inspection. Sig. of BIS I.O. _____ Name _____ Designation _____ Date of verification _____

CM/PF 306

ANNEX A-2

(Sl. No. 9 on the List of Documents)

DECLARATION REGARDING TEST EQUPMENT

No entry to be crossed

1. Application No. _____ 2. Licence No. _____
   Name /Address
3. _____

Sl.	Test Equipment/Chemicals	Least Count &	Valid	Tests	Remarks

No. & Date	and Identification Numbers (Where applicable)	Range (Where applicable)	Calibration (Where required) Yes/No	Used in with Clause Reference	(Indicate number of Equipment)

I hereby declare that the test equipments of which details are given overleaf are owned by me and are actually installed in the premises. I also declare that in case of grant of licence, I will send intimation to BIS whenever any equipment is taken out of the premises of the firm due to any reason. Signature of firm's Representative_____ Name:_____ Designation_____ Date:_____	I have checked and found that the test equipment of which details are given overleaf were available during my inspection. Sig. of BIS I.O. _____ Name:_____ Designation:_____ Date of verification _____

ANNEX A-3

(Sl. No. 16 on the List of Documents)

UNDERTAKING BY APPLICANT APPLYING UNDER SIMPLIFIED PROCEDURE

(To be submitted on the letter head by CEO/Authorized Signatory to concerned Head of the Branch office along with the Application and other documents)

The Director and Head BIS

_____

Dear sir

I, ----------(name of person), ----------(designation) have applied for a licence to you for

use of BIS standard mark on ----------(name of product) being manufactured at our factory at ----------(give address).

I give an undertaking that the licence if granted against his application shall be put under Stop Marking by BIS if the verification sample(s) drawn during verification visit of the BIS officer prior to grant of licence fail to conform to the Indian Standard.

In such a case, I shall take necessary corrective actions and inform the same to BIS within 15 days along with offering fresh lot of products manufactured after taking corrective actions, from which samples (of rating/size/variety which facilitates verification of corrective actions on the reported failures) shall be drawn by BIS for independent testing .

I agree that the resumption of marking in such cases shall be allowed only on the basis of independent satisfactory Test Reports of the fresh samples offered (including long duration tests where failures were in long duration tests). In case the fresh sample drawn by BIS for independent testing fails, or the licensee does not inform corrective actions taken and does not offer improved samples within 15 days of the date of Stop Marking, the licence shall be processed for cancellation without any further chance to me

Date:

(Name)

(Designation)

(Seal)

Annex B

CHECK-LIST FOR APPLICATION TO BE SUBMITTED BY APPLICANT TO BIS WHILE APPLYING FOR BIS LICENCE UNDER PRODUCT CERTIFICATION SCHEME OF BIS

The following check-list is required to be submitted with all the applications for grant of BIS licence under the Product Certification Scheme of BIS. Please tick (√) in the relevant box.

Whether applied under: Simplified Procedure ☐ Normal Procedure ☐

Note: *Refer BIS website or details of "Simplified Procedure" and "Normal Procedure" for grant of licence.*

No.	Check-point	Requirements	Observations	Page No.
	General	Is the application form completely filled?		
1.	Name & Address	Is the name and address of applicant (manufacturing unit applying for licence) same in the application as given in the attached document of Central/State Government		
2.	Status of Applicant (Manufacturing Unit)	a. Has it been indicated whether the applicant is a large scale or small scale unit?		
		b. In case the applicant is a small scale unit, does the applicant hold valid Registration Certificate from the Local / State authority or from a Chartered Accountant, and is the certificate attached.		
		c. Has it been indicated whether the applicant is a Public Sector or a Private Sector company?		
3.	IS No. & Varieties	a. Has applicant recorded the applicable Indian Standard with correct title of the Standard?		
		b. Where applicable, has applicant mentioned designation, grade, type, variety, size, etc., of the product for which the BIS licence is sought?		
5.	History	a. Where applicable, has the applicant provided information regarding earlier BIS licence(s) held by them and / or cancelled in the past?		
		b. Where applicable, has the applicant provided information regarding BIS licences currently held by them?		
6.	Signature	a. Is the application signed by the CEO of the applicant?		
		b. In case the application is signed by a person other than the CEO, is the application signed by the authorized signatory of the applicant and his authorization is attached by the authorized signatory?		
7.	Machinery	a. Does applicant possess requisite manufacturing infrastructure to manufacture the product as per the Indian Standard?		
		b. Is installed capacity of production indicated in the application?		
		c. Does applicant have all machineries installed as per manufacturing process at the applicant's manufacturing premises?		
		d. If answer to 'c' above is no, does the applicant outsource any of its manufacturing processes and possesses valid agreement(s) with other manufacturing units for the outsourced processes and traceability of material, thus		

		produced, etc.?		
		e. If answer to 'd' above is yes, does the applicant has any control over such outsourced activity? Are these outsourced process will ensure testing the quality of final product for all requirements at the applicant's manufacturing premises?		
8.	Test Equipment & Calibration	a. Does applicant possesses requisite test facilities in-house as per the relevant Indian Standard at its factory address?		
		b. Are valid calibration certificates for relevant test equipment attached are complete and valid at least 3 months after the date of recording?		
		c. If reply to 'a' above is no, does applicant have arrangement with a BIS recognized outside lab for testing of the requirements for which it does not possess test facilities in-house? Is the consent letter as attached by applicant in this regard in order? **Note:** *Relaxation in in-house test facilities may be allowed on submission of proper justification for requirements which are obligatory to get tested and for which frequency of testing, as prescribed in the relevant scheme of testing and inspection (STI), is, normally, one month or more*.		
9.	QC personnel	Does the applicant employ qualified & experienced Quality Control (QC) personnel on permanent basis and possess documentary evidence to establish the same? Are the copies of the qualification certificates and appointment letters of the QC personnel are in order.		
10.	Raw Materials and Components	Where ever requirements for raw materials/ components used in the manufacturing of the product are specified in the standard, do test reports/suppliers' test certificates, as submitted by the applicant show that these requirements are met as per the standard?		
11.	Plant Layout	Does copy of the plant (applicant manufacturing premises) layout clearly indicates locations of manufacturing machinery, laboratory, office, workshop, amenities, storage area, etc.?		
12.	Test Report(s)	a. Is the attached test report of in-house or from independent laboratory cover all requirements of the Indian Standard and is passing in such requirements?		
		b. In case the application is filed under "simplified Procedure" is the test report(s), in original, as submitted a) from BIS or its recognized laboratories? b) the test report is not older than one month from the date of submission of application, c) covers all the requirements of the standard, and d) passes in all such requirements		

13.	Undertaking	In case application is under simplified procedure, an undertaking shall be obtained from the applicant on his letter-head that the licence if granted against his application shall be put under Stop Marking by BIS if the verification sample(s) (any sample including the long duration test samples) drawn during visit of the BIS officer prior to grant of licence fail to conform to the requirements of relevant Indian Standards. The licensee shall take necessary corrective actions and inform the same to BIS along with fresh samples (of rating/size/variety which facilitates verification of corrective actions on the reported failures) manufactured after taking the corrective actions. The resumption of marking in such cases shall be allowed only on the basis of independent satisfactory Test Reports of the fresh samples offered (including long duration tests where failures were in long duration tests). In case the fresh sample drawn by BIS for independent testing fails, or the licensee does not inform corrective actions taken and does not offer improved samples within 1 month of the date of Stop Marking, the licence shall be processed for cancellation and no further chance would be given to the licensee		

Section II: Raw Materials / Components

5. Following is the list of the important raw materials which are required to confirm to the relevant Indian Standards

5.1 HDPE Granules

High Density Polyethylene (HDPE) used for manufacture of pipes shall confirm to designation PEEWA – 45 – T – 003 or PEEWA – 45 – T – 006 or PEEWA – 50 – T – 003 or PEEWA – 50 – T – 006 or PEEWA – 57 – T – 003 or PEEWA – 57 – T – 006 of IS7328 : 1992. HDPE confirming to designation may also be used with exception that melt flow rate (MFR) shall be between 0.20 gm per 10 minutes to 1.10 gm per 10 minutes. The specified base density shall be between 940.0 kg/m^3 to 958.4 kg/m^3 and shall be determined as per IS7328 : 1992.

5.2 Black Master Batch

The HDPE granules with above mentioned designations and properties duly stabilized with Anti-Oxidants may be compounded with suitable Black Master Batch or processed directly after physical mixing with Black Master Batch in pipe extruder for production of pipe which shall confirm to performance requirements of pipes in IS14333: 1996. The material of pipe to be produced shall confirm to material requirements of IS 14333:1996.

5.3 Anti-Oxidant

The percentage of Anti-Oxidant shall not be more than 0.3% by mass of finished raisin.

Section III: Manufacturing process and in process quality controls

6. Description of the Manufacturing Process

Description of Manufacturing Process:

- HDPE granules duly stabilized with Anti-Oxidants as received by the supplier is mixed with Black master Batch in a pre-heating mixture.

- The mixture mixed blend of the compound is feeded in the hooper of extruder.

- The compound material is heated in bazzel zone of extruder which consists of different zones maintaining the temperature range from 170 to 210 degree centigrade.

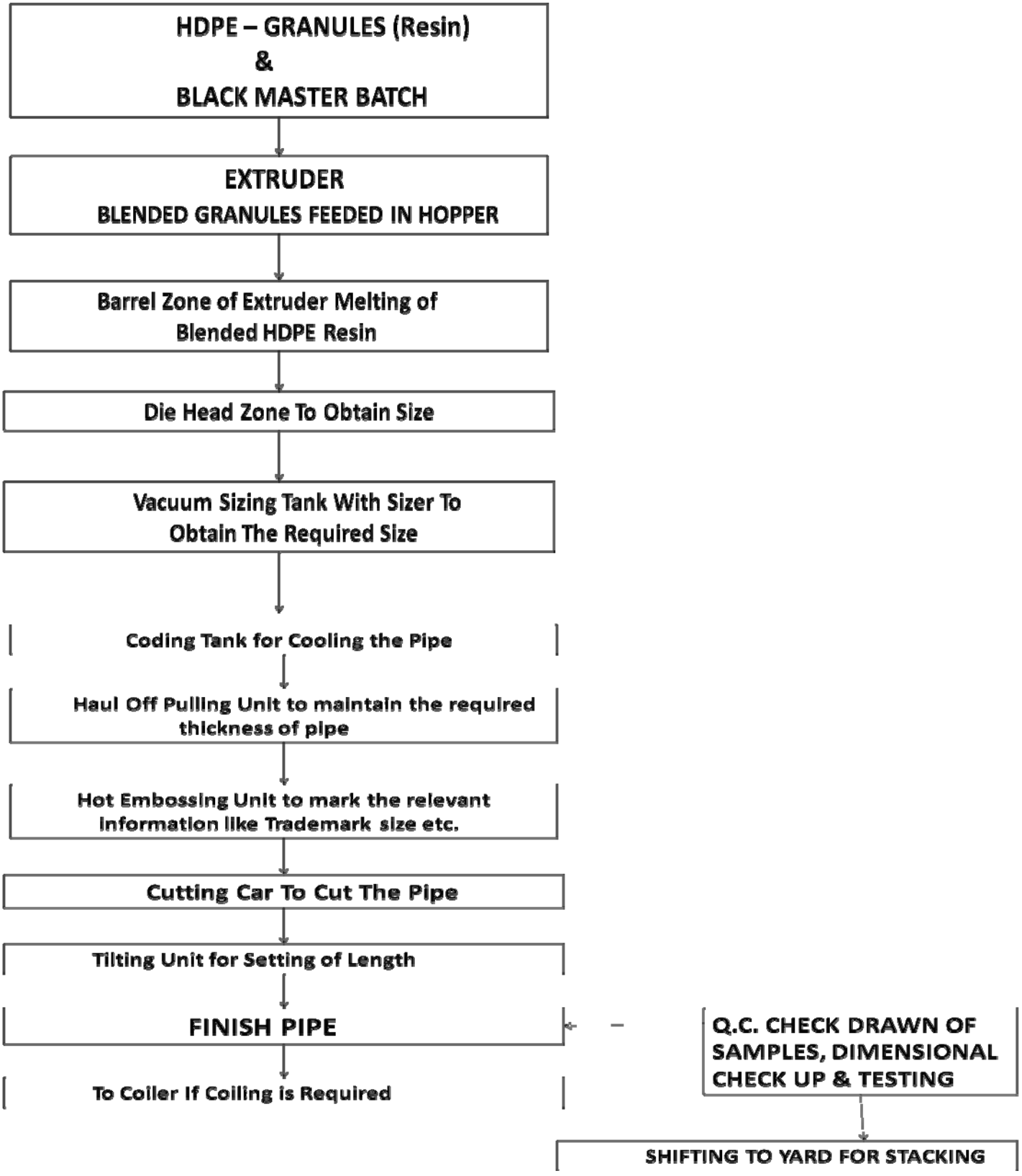
- The soften material now comes to die head zone where the dies and mandrals are fitted to obtain the required size.

- Now the hot and soft material passes through the sizer fitted in vacuum sizing tanks maintaining the outer diameter of required pipes.

- The hot pipe passes through the cooling tank and then it becomes hard after cooling.

- The haul off / puller continuously pulls the pipe at a RPM by which the required thickness range is achieved. After this hot embossed marking at required intervals on each pipe is done and pipes are cut into required length by suitable cutting arrangements

PROCESS FLOW CHART


HDPE – GRANULES (Resin)
&
BLACK MASTER BATCH
EXTRUDER
BLENDED GRANULES FEEDED IN HOPPER
Barrel Zone of Extruder Melting of Blended HDPE Resin
Die Head Zone To Obtain Size
Vacuum Sizing Tank With Sizer To Obtain The Required Size
Coding Tank for Cooling the Pipe
Haul Off Pulling Unit to maintain the required thickness of pipe
Hot Embossing Unit to mark the relevant information like Trademark size etc.
Cutting Car To Cut The Pipe
Tilting Unit for Setting of Length
FINISH PIPE
To Coiler If Coiling is Required
Q.C. CHECK DRAWN OF SAMPLES, DIMENSIONAL CHECK UP & TESTING
SHIFTING TO YARD FOR STACKING

7. Infrastructure for production

Machinery & Equipment required for production is as follows:

S.No.	Machinery
1	HDPE Pipe extruder with Panel and Jockey Extruder
2	Die heads (as per the required size)
3	Die, mandrel & Sizer sets (as per the required size)
4	Vacuum Cooling Tank
5	Spray Cooling Tank
6	Traction Unit
7	Tube Cutting Unit
8	Pipe Tilting Unit
9	Pipe Coiling Unit
10	Hot Embossing Machine
11	Air Compressor with dryer
12	Chilling Plant
13	Weighing Scale
14	Hopper Dryer and Loader
15	Generator

Section IV: Certification Criteria

8. Identification of critical requirements of Indian standards:

8.1 Internal pressure creep rupture tests (Hydraulic Characteristics)

8.2 Longitudinal Reversion

8.3 Dimension of the pipes

8.4 Density

8.5 Melt Flow Rate

8.6 Carbon Black Content

8.7 Carbon Black Dispersion

9. Scheme of Testing and Inspection : Document – STI/14333/1:FEB 99

The Scheme of Testing and Inspection for IS14333-1996 for HDPE pipes for sewerage has been finalized as per document - STI/14333/1 of FEB 99.

SCHEME OF TESTING AND INSPECTION

FOR CERTIFICATION OF HIGH DENSITY POLYETHYLENE PIPES FOR SEWARAGE ACCORDING TO IS 14333 : 1996

1.0 LABORATORY: A laboratory shall be maintained which shall be suitably equipped and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 All testing apparatus shall be periodically checked and calibrated and records of such checks/calibration shall be maintained.

2.0 TEST RECORDS: All records of tests and inspection shall be kept in suitable forms approved by the Bureau.

2.1 Copies of any records and other connected papers that may be required by the Bureau shall be made available at any time on request.

3.0 QUALITY CONTROL: It is recommended that, as far as possible, Statistical Quality Control (SQC) methods may be used for controlling the quality of the product during production as envisaged in this Scheme [See IS 397 (Part I):1972, IS 397 (Part 2):1985 and IS 397 (Part 3):1980].

3.1 In addition, effort should be made to gradually introduce a Quality Management System in accordance with the Quality system modules as per IS/ISO 9001 or IS/ISO 9002 or IS/ISO 9003 as appropriate to the activities of the organization.

4.0 STANDARD MARK: The standard mark(s) as given in column (1) of the First Schedule of the license shall be clearly marked with indelible ink/paint on either of each straight length of pipe and for coil at both ends or hot embossed on white base every meter throughout the length of pipe/coil, provided always that the pipe to which this mark is thus applied, confirms to every requirement of the specification.

5.0 MARKING: In addition, the following information shall be clearly marked in indelible ink/paint on either end of each straight length of pipe and for coil at both ends or hot emobossed on white base every meter throughout the length of pipe/coil.

a) Manufacturer's name and Trade Mark, if any

b) Diameter of the Pipe (See clause 3.1 of specification)

c) Lot Number / Batch Number in code or otherwise which will enable to trace back the date of production and test records

d) Licence Number (CM/L……)

e) Made in India

6.0 CONTROL UNIT: Pipes of same designation from a continuous extrusion run of one machine manufactured from same batch of raw material upto a maximum of 48 hours duration shall constitute a control unit.

7.0 Reworked Material: The addition of not more than 10 percent of manufacturers own rework material resulting from the manufacture of pipe is permissible. No other reworked or recycled material shall be used.

7.1 Storage and handling of pipes should be as per provisions given in IS 7634 (Part2:1975)

8.0 LEVELS OF CONTROL: The tests as indicated in Table 1 and at levels of control specified therein shall be carried out on the whole production of the factory covered

by the scheme and appropriate records and charts maintained in accordance with clause 2.0 above. All the production which conforms to the Indian Standard and covered by this license shall be marked with certification Mark of the Bureau.

8.1 In respect of all other clauses of specification and all stages of manufacture, the factory shall maintain appropriate controls and checks to ensure that their products confirms to the various requirements of those clauses.

9.0 REJECTIONS: A separate record shall be maintained giving information relating to the rejection of the production not conforming to the requirements of the specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the specification.

10.0 SAMPLES: The licensee shall supply, free of charge, the samples required in accordance with Bureau of Indian Standard (Certification) Regulations, 1988, as subsequently amended, from his factory or godowns. The Bureau shall pay for the samples taken by it from the open market.

11.0 REPLACEMENT: Whenever a complaint is received soon after the goods with Standard Marks have been purchased and used and if there is adequate evidence that the goods have not been misused, defective goods are replaced free of cost by the licensee in case the complaint is proved to be genuine and the warranty period (where applicable) has not expired. The final authority to judge the conformity of the product to the Indian standard shall be with the Bureau.

11.1 In the event of any damages caused by the goods bearing the Standard Mark, or claim being filed by the consumers against BIS Standard Mark and not “conforming to” the relevant Indian Standard, entire liability arising out of such non-conforming product shall be of licensee and BIS shall not in any way be responsible in such cases.

12.0 STOP MARKING: The marking of the product shall be stopped under intimation to the Bureau if, at any time, there is some difficulty in maintaining the conformity of their product to the specification, or the testing equipment goes out of order. The marking may be resumed as soon as the defects are removed under intimation to Bureau.

The marking of the product shall be stopped immediately if directed to do so by Bureau for any reason. The marking may then be resumed only after permission by the Bureau. The information regarding resumption of markings shall also be sent to the Bureau.

13.0 PRODUCTION DATA: The licensee shall send to BIS as per the enclosed Performa to be authenticated by a Chartered accountant a statement of quantity produced, marked and exported by him and the trade value thereof and of each operative year of the licence.

Clause	Requirement	Clause	Reference	No. Of Samples	Frequency	Remarks
5	Material	5.1, 5.1.1	IS 14333 : 1996	One	Each batch in the consignment	In case Test Certificate is received for each batch along with each consignment of raw material, further testing in factory would not be necessary
		5.1.2, 5.1.3	IS 7328 : 1992			
		5.1.4	IS 2530 : 1963			
		5.2	IS 14333 : 1996			
4	Color	4	IS 14333 : 1996	Each coil or length of pipe extruded		-
6	Dimension of Pipes	6.1 , 6.2	IS 14333 : 1996	Each coil or length of pipe extruded		-
		6.3, 6.4, 6.5				
		Annexure A				
7	Visual Appearance	7	IS 14333 : 1996	Each coil or length of pipe extruded		-
8.1	Hydraulic	8.1	IS 14333 :	Three pipes drawn at		In a period of two

	Characteristics Internal Pressure Creep Rupture Test (Type Test)	Table 3 Annex B	1996	regular intervals		years an each pressure rating of pipe of the highest size manufactured during the period shall be tested
8.1	Hydraulic Characteristics Internal Pressure Creep Rupture Test (Acceptance Test)	8.1 Table 3 Annex B	IS 14333 : 1996	Three pipes drawn at regular intervals	Each Control Unit	In case of any failure the Control Unit shall be rejected.
8.2	Reversion Test	8.2, Annex – C	IS 14333 : 1996	Three pipes drawn at regular intervals	Each Control Unit	In case of any failure the Control Unit shall be rejected.
8.3	Density	8.3	IS 7328 : 1992	Composite Sample of 3 pipes drawn at regular intervals	Each Control Unit	In case of any failure the Control Unit shall be rejected.
8.4	Melt Flow Rate (MFR)	8.4	IS 2530 : 1963	Composite Sample of 3 pipes drawn at regular intervals	Each Control Unit	In case of any failure the Control Unit shall be rejected.
8.5	Carbon Black Content and Dispersion	8.5	IS 2530 : 1963	Composite Sample of 3 pipes drawn at regular intervals	Each Control Unit	In case of any failure the Control Unit shall be rejected.

(*) – In case of any failure, marking shall be stopped immediately and BIS shall be informed of failure and to witness fresh testing corrective action shall be taken and marking shall be resumed after satisfactory test results of 3 samples. This test shall also be carried out whenever change is made in polymer composition or method of manufacture or when a new size is to be produced.

Some of the key highlights for the Testing are as below:

1. Control Unit:

   Pipes of same designation from a continuous extrusion run of 1 machine manufactured from same batch of raw material upto a maximum of 48 hour duration shall constitute a control unit.

2. Reworked Material:

   The addition of not more than 10 percent of manufacturers on reworked material resulting from manufacture of pipes is permissible. No other reworked or recycled material shall be used.

3. Anti Oxidants:

   The percentage of Anti-Oxidants used shall not be more than 0.3 percent by mass of finished raisin.

4. Test for the Raw Material:

Each batch in the consignment of the raw material shall be tested for the following:

- Density
- Melt Flow Rate
- Carbon Black Content
- Dispersion of Carbon Black

10. Marking Fee Rates

Description	Value
Unit	1kg
L.S Marking Fee	Rs 87200
S.S Marking Fee	Rs75200
Slab 1 Rate	0.22
Slab 1 Qty	All

Note: These rates are subject to revision and only the revised rates shall be applicable

11. Grouping Guidelines / Inclusion of new varieties:

Grouping Guidelines for Grant of Licence / Inclusion of New varieties for High density polyethylene pipes for sewerage as per IS 14333:1996.

IS 14333:1996covers the following sizes and types of HDPE pipes for sewerage:

(a) Material Grade: PE 63, PE 80 & PE 100(3 material grades)

(b) Pressure Rating: PN 2.5, 4,6, 8,10,12.5&PN 16(7 Pressure ratings of each material Grade)

(c) Sizes: DN 63 to DN 1000.

In order to adopt rationalized approach for grant of license and inclusion of additional varieties covered in the specification the following grouping guidelines shall be considered.

Material Grade	Pressure Rating(PN)Group			Sizes Group		
	Low	Medium	High	Group – 1	Group – 2	Group – 3
PE63	2.5 &4	6,8 & 10	12.5 & 16	63 to 180mm	200 to 500mm	560 to 1000mm
PE80	-do-	-do-	-do-	-do-	-do-	-do-
PE 100	-do-	-do-	-do-	-do-	-do-	-do-

1. Two samples from each sizes group (highest and preferably the lowest size from the offered sizes) for each material grade and pressure rating group shall be tested for all the requirements of the IS specification to cover the complete range of varieties offered in the group.

2. Highest Pressure rating to be tested to cover all Pressure ratings in the group of Low,

Medium, High pressure rating groups.

3. Highest and preferably the lowest size to be tested to cover all sizes in the size group.

4. For inclusion of additional sizes/varieties in the existing license, samples shall be drawn, following the same procedure as mentioned above for grant of license.

However, while considering grant of license/ inclusion of additional sizes/ varieties, it will be ensured that the applicant / licensee has got the complete manufacturing and testing facilities for all the sizes and the varieties intended to be covered. During operation of the license, BO will ensure that all the material grade, pressure ratings and sizes covered in the license are tested in rotation.

12. Guidelines for writing scope of the license

Scope of license should include the following for which license has been granted as per the existing grouping guidelines:

- Material grade: Can be PE63, PE80, PE100. It can be either or all of these.
- Pressure Rating: Can be PN 2.5, 4,6,8,10,12.5&PN 16, as per the License granted.

- Nominal diameter: Can be between DN 63 to DN 1000, as per the License granted.

13. Sample Size

Sample size for sending samples to different labs for testing shall be 3 pieces of 1 meter each and 1kg of the HDPE granules used as raw material.

14. Manner of sealing of the samples

- The drawn samples are coded and signed on the pipe itself with permanent marker. Thereafter they are packed in sacks, sealed with BIS seal and sent to labs for testing.

- The Raw material samples are to be packed in Poly. Bags and sealed with BIS seals.

15. Whether remnants of samples are returnable/non-returnable, to be scraped / used, to be deshaped before disposal

The remnants of samples are non-returnable and may be scraped after complete testing by the laboratory

16. Procedure to be followed for destroying / deshaping / recycling the product that does not meet the quality parameters during regular production

The product that does not meet the Quality parameters during regular production is recyclable. It is grinded and is used as reworked material of IS 14333 – 1996.

* For more information on Reworked Material, refer to Section: 9

Section V: Inspection and Testing

17. Packing Material Requirements (to be available in factory at all times) for Packing / Dispatch of samples

The following materials are required and shall be available in factory for packing/dispatch of the samples:

- Sacks
- Permanent Marker
- Sealing Wax
- Polyethylene Bags
- Threads for tying the Sacks and samples

18. List of the Required Test Equipments Test Equipments / Facilities with requirement and frequency of calibration

S.No	Test Equipment	Range	Least Count	Valid Calibration (Where required)	Test Used In With Clause reference
1	Carbon Black Content Apparatus (Combustion Boat, Combustion Tube, Muffle Furnance, Nitrogen Cylinder)	Upto 900 deg, c	1 deg,c	Yes	Clause 8.5 - Carbon Black Content Test
2	Hot Plate	Upto 300 deg, c	0.1 deg, c	Yes	Clause 8.5 - Carbon Black Dispersion
3	Projection Microscope			-	Clause 8.5 - Carbon Black Dispersion
4	Melt Flow Rate Test Equipment	Upto 600 deg, c	0.1 deg, c	Yes	Clause 513, 8.4
5	Heated Press	-	-	Yes	Clause 5.1 - Density
6	Analytical Balance	0- 200 gm	0.1 mg	Yes	Clause 5.1 - Density
7	Hydro Meter	-	-	-	Clause 5.1 - Density
8	Thermometer	0 – 100 deg, c	0.1 deg, c	Yes	Clause 5.1 - Density
9	Digital Pressure Control Panel Station 4 Nos for Internal Pressure Creep Rupture Test	0 – 6Kg/cm2 (For 48 Hours)	0.05 kg/cm2	Yes	Clause 8.1 - Internal Pressure Creep Rupture Test
		0 – 10 Kg/cm2 (For 148 Hours)	0.1 kg/cm2		
		0 – 25 Kg/cm2	0.2 kg/cm2		

		0 – 60 Kg/cm2	0.5 kg/cm2		
10	Long Term Test Bath	Upto 200 deg, c	+- 0.1 deg, c	Yes	Clause 8.1 - Internal Pressure Creep Rupture Test
11	Testing Heads	As Per The Size	As Per The Size	-	Clause 8.1 - Internal Pressure Creep Rupture Test
12	Hot Air Oven	Upto 300 deg, c	1 deg, c	Yes	Clause 8.2 - Longitudinal Reversion Test
13	Vernier Calliper	0 – 300 mm	0.02 mm	Yes	Clause 6 - Dimension of the pipe
14	Micrometer	0 – 25 mm	0.01 mm	Yes	Clause 6.2 – Wall Thickness
15	Pie Tape	28 – 300 mm 300 – 600 mm	0.01 mm	Yes	Clause 6 - Dimension of the pipe
16	Measuring Tape	0 – 15 meter	1 mm	Yes	Clause 6 - Dimension of the pipe
17	Measuring Scale	0 – 1 meter	0.5 mm	Yes	Clause 6 - Dimension of the pipe
18	Air Conditioner	-	-	-	Room Conditioning
19	Chemicals like: • Butyl Acitate • Tricholoro Ehtylene • Ethyl Alcohol • Hydrochloric Acid • Sulphuric Acid etc	-	-	-	-
20	Glassware like: • Beaker • Measuring Cylinder etc	-	-	-	-

Note: Inputs for the list of the Test Equipments shall also be reviewed / provided also by the CL. The Test Equipments shall be calibrated from NABL accredited laboratories having valid calibration. The calibration shall be valid for 1 year.

In case of breakdown of some Test Equipments, after resetting the instrument in working the Equipments shall be re-calibrated from NABL accredited laboratory.

19. Status of Test Facilities in BIS laboratory and OSLs Laboratory with Testing charges and approximate time required for testing by BIS laboratory / OSLs

19.1 List of BIS Laboratories

Lab	Quantity	Lab Type	Testing Facility	Remarks
IS Number :- IS 14333 - 0 : 1996				
CL	2 PCS	Mech	P	Hyd. Pressure test under Renovation
WROL	2 PCS	Mech	P	Melt flow rate

19.2 List of Outside Recognized Laboratories

IS Number:- IS 14333 - HDPE PIPE FOR SEWERAGE

S.No.	Name of the Recognized Laboratory	Address of the Laboratory	Lab Code	Testing Charges	Remarks
1	Central Institute of Plastics Engineering & Tech.	(CIPET), P.O. Rayon & Silk Mills, Amritsar 143104 Punjab Contact : Sh. Ishwer Singh, Chief Manager Project Tel : 0183-2258938 Fax : 0183-2258671	9120034	Rs. 9,200/-	
2	MSME Testing Centre	M/o Micro, Small & Medium Enterprises, Kurla Andheri Road, Sakinaka, Mumbai-400072 Maharashtra	7119404	Rs.5000/- and Rs.2000/- for HDPE Granules	

		Contact : Sh. S.Vijay Kumar, Director Tel : 022-28576998 Fax : 022-28572238			
3	Central Institute of Plastics Engineering & Tech	EPIP Complex, Hajipur Indl. Area Distt. - Vaishali-844101 Bihar Contact : Sh. D.P. Yadav, Chief Manager(TS) Tel : 06224-277424, 273515 Fax : 06224-275316	5118334	Rs. 9200/-	Included w.e.f. 08-Oct-13
4	Central Institute of Plastics Eng & Technology	City Centre, P.O. Debhog, Dist. Purba Medinipur Haldia-721657 West Bengal Contact : Mr.P.Poomalai, Dy Director Tel : 03224-255404 Fax : 03224-253016	5116334	Rs.9,200/-	For sizes upto 355 mm DN & except anti-oxidant test
5	Central Institute of Plastics Engineer and Technology	Plot No.630, Phase IV, GIDC, Vatva Ahmedabad-382445 Gujarat Contact : Dr. S.C.Sit, Deputy Director, Tel : 079-25830569,5219 Fax : 079-25835236	7116134	Rs.7,175/-; Rs.2,025/- (material)	Up to size 400 mm diameter
6	Central Institute of Plastics Engg. & Tech (CIPET)	HCL Post, IDA-Phase II, Cherlapally, Hyderabad-500051 Andhra Pradesh Contact : Shri Kiran Kumar,Manager Project Tel : 040-27264040, 3750 Fax : 040-27264051	6111634	Rs.9,200/-	(Suspended w.e.f. 04-Oct-2013)
7	Central Institute of Plastics Engg.& Tech.(CIPET)	B-27, Amausi Indusrial Area, Lucknow-226008 Uttar Pradesh Contact : Dr. Vijay Kumar, Dy.Director Tel : 0522-2436210,2437646 Fax : 0522-2436227	9102534	Rs.4600/-	
8	Central Institute of Plastics & Engg. Tech.(CIPET)	G. Sector, Govindpura, Industrial Area Bhopal-462023	8100534	Rs.9,200/-	Upto 315 mm DN and excluding chemical

		Madhya Pradesh Contact : Shri P.K. Sahoo Chief Manager(P) Tel : 0755-2687454,2688288 Fax : 0755-2689041			resistance classification (Annexure-D)
9	Central Institute of Plastics Engg. & Technology	Plot No.J-3/2, MIDC Industrial Area, Chikalthana Aurangabad-431006 Maharashtra Contact : Sh.Sandesh Kr Jain, Manager(Project) M:09325687901 Tel : 0240-2480375,2480164 Fax : 0240-2476626	7123534	Rs.4600/-	Upto 400mm Nominal Dia
10	National Test House (NWR)	E 763, Road No.9F-1 VKI Area, Jaipur-302019 Rajasthan Contact : Sh.Rakesh Saini, Scientist In-charge Tel : 0141-2332057,58 Fax : 0141-2330074	8122904	Rs.7500/-	
11	Central Institute of Plastics Engg. & Technology	SP-1298, Sitapura Industrial Area, Phase-III Tonk Road, Jaipur-302022, Rajasthan Contact : Mr. Lalit Guglani, Manager Tech. Services Tel : 0141-3239784 Fax : 0141-2770736	8122834	Rs.4600/-	

19.3 Tentative Time required by BIS Labs/ OSLs

The Tentative Time required by BIS Labs / OSLs is 1 Month

20. Grant of License

The Grant of License would be based on Independent Testing Basis

21. Details of Tests to be carried out in the factory in case of:

21.1 Applicant / Verification Samples

All possible tests in a day shall be carried out in factory during Applicant / Verification visit like:

- Dimension of Pipe
- Visual Appearance
- Reversion Tests
- Density
- Melt Flow Rate
- Internal Pressure Creep Rupture Test: Note – This test is applicable for pipes which have been manufactured before 24 hours of the test.

21.2 Surveillance / Market Samples

All possible tests in a day shall be carried out in factory for Surveillance Inspection. The samples drawn during Surveillance Inspection / Market Samples are to be tested completely as per IS14333 from independent laboratories.

21.3 Raw Material Samples

Raw Material Samples are to be tested for:

- Melt Flow Rates
- Density
- Carbon Black Content
- Dispersion of Carbon Black