



Underground Water Storage Tank (SUMP)

User should check the validity of the Certificate by contacting Member Secretary, BMBA at BMTPC or the Holder of this Certificate.

Name and Address of Certificate Holder:

**M/s Sintex Industries Ltd.
Kalol (N. Gujarat) – 382721
Gandhinagar, India**

Performance Appraisal
Certificate No.

PAC No **6 / 2009**

Issue No. **1**

Date of Issue: **14.07.2009**



bmtpc

**Building Materials & Technology Promotion Council
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**Performance Appraisal Certificate
for
UNDERGROUND WATER STORAGE TANK
(SUMP)
Issued to**

M/s SINTEX INDUSTRIES

STATUS OF PAC 6/2009

S. No.	Issue No.	Date of Issue	Date of renewal	Amendment		Valid upto (Date)	Remarks	Signature of authorized signatory
				No.	Date			
1.	2.	3.	4.	5.	6.	7.	8.	9.
1	1	14-07-09	14-07-12	--	--	14-07-12	--	<i>[Signature]</i> 14/07/09

PAC No.6/2009 Issue No.1 Date of issue 14-07-2009

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PART – I CERTIFICATION

- I – 1 **Certificate Holder:** **M/s Sintex Industries Ltd.**
Kalol (N. Gujarat) – 382721
Gandhinagar, India
Phone No. 95-2764-253500
Fax No. 91-2764-253800
- I – 2 **Description of Product**
- I – 2.1 **Name of the Product** – Underground Water Storage Tank (Sump)
- I – 2.2 **File Reference** – QA/BMTPC/08
- I – 2.3 **Brief Description** --Underground water storage tank (sump) is a one piece moulded Polyethylene tank without any joints, seams or welds. The polyethylene material used is of food grade quality to enable store portable water in the tank. The tank surface is impermeable to roots of trees & is also non-porous and does not allow contamination of water stored in the tank. The tank is provided with suitable polyethylene inlet & outlet pipes and air vent. The underground water storage tank is provided with a suitable SMC (Sheet Moulding Compound) manhole cover.
- I – 3 **Assessment**
- I – 3.1 **Scope of Assessment** – Polyethylene underground water storage tanks are an alternate solution to the concrete or brick water storage tanks for keeping water safe from contamination below the ground. These are lightweight, easy to transport & install. These are durable, dust proof & leakproof. These underground tanks are suitable for houses, schools, hospitals, offices etc.
- I – 3.2 **Scope of Inspection** – Scope of inspection included the verification of production and testing facilities at the factory

including competence of technical personnel and status of quality assurance in the factory.

I – 3.3 Assessment Summary

I – 3.3.1 The assessment was done through inspection, laboratory testing and field observations of the underground tanks.

I – 3.3.2 Manufacturing & test facilities – Manufacturing and test facilities available in the factory were found to be suitable & adequate to produce the underground water storage tanks as per details listed in Annexures 10 & 13 of DAF No. QA/BMTPC/08..

I – 3.3.3 Competence of Technical Personnel – Personnel involved in training were found to be well conversant with testing procedures required for the quality control of the product.

I – 3.3.4 Quality Assurance Procedure – The firm follows a Quality Assurance System for production of underground storage tanks.

I – 3.4 Durability

I – 3.4.1 These tanks are designed for a life span of 15 years.

I – 4 Use of the underground water storage tanks (sump) & their Limitations

I - 4.1 Design Data – The design data parameters shall depend upon the size & dimensions of the underground tanks to be used

I – 4.2 Storage & handling at the user end before installation

I – 4.2.1 Storage – At the user's end these tanks shall be stored on a hard & uniform surface so that they may not develop cracks later on.

I – 4.2.2 Handling – Underground water tanks (sump) shall be handled carefully during storage or installation in order to prevent occurrence of damages to the edges & faces. These shall not be

dragged along the surface but shall be lifted clear of any surface on which they are stored.

I – 4.3 Uses of the tanks

I – 4.3.1 The samples of the polyethylene underground tanks tested as per the Company & Indian Standards IS 8543 (Part 4) & IS 13360 (Part 5) have been found suitable against Visual appearance & Dimensions, Deformation, Tensile Strength, Flexural Modulus, Resistance to Impact & Fitment of Lid in accordance with the acceptance criteria given in test report of M/s CIPET which led to the conclusion that they can be used as underground tanks provided they are installed in accordance with the manufacturers instructions & guidelines.

I – 4.4 Limitations of use

I – 4.4.1 Not recommended for use where radiation hazards are there

I – 4.4.2 Not recommended for use in excessive high water table areas

I – 4.4.3 Do not install these tanks across path of vehicles or heavy equipment

I – 4.4.4 Do not install these tanks near Underground electrical cables or drinking water pipelines.

I – 4.4.5 Install these tanks strictly as per the instruction manual given with the tank.

I – 5 Conditions of Certification

I – 5.1 **Technical conditions** –Eco-friendly materials shall be used for the manufacture of underground tanks..

I – 5.2 **Quality Assurance** – The Certificate Holder shall implement & maintain a quality assurance system in accordance with Scheme of Quality Assurance (SQA) given in Annexure.

I – 5.3 Handling of User Complaints

I – 5.3.1 The Certificate holder shall provide quick redressal to consumer/user complaints proved reasonable & genuine and

within the conditions of warranty provided by him to customer/purchaser

I – 5.3.2 The Certificate holder shall implement the procedure included in the SQA. As part of PACS Certification he shall maintain data on such complaints with a view to assess the complaint satisfaction and suitable preventive measures taken.

I – 6 Certification

I – 6.1 On the basis of assessment given in Part III of this Certificate & subject to the conditions of certification, use & limitations set out in this Certificate and if selected, installed & maintained as set out in Part I & II of this Certificate, the underground water storage tanks covered by this Certificate are fit for use set out in the Scope of Assessment.

Part – II Certificate holder's Technical Specifications

II – 1 General

II – 1.1 The PAC holder shall manufacture the underground water storage tanks (sump) in accordance with requirements specified. In addition it shall follow Company standards specifying requirements of various materials used in the manufacture of underground tanks (see Part V)

II – 2 Specification for the product & design information

II – 2.1 Specifications – The specifications for raw materials & finished tanks shall be as per performance criteria when tested in accordance with the company & relevant Indian standards.

II – 2.2 Technical Specifications

II – 2.2.1 Raw Materials

- (i) Polyethylene – Procured from IPCC/GAPC/Reliance as per IS 12701 – 1996
- (ii) Black Master Batch –Som Shiva Impact

II – 2.2.2 Construction & workmanship

- (i) The underground water storage is a one piece moulded Polyethylene tank without any joint, seams or welds. The tank is provided with suitable polyethylene inlet & outlet pipes and air vent. The underground water storage is provided with a suitable SMC (Sheet Moulding Compound) manhole cover. The underground water storage tank is for underground installation only.
- (ii) The internal & external surface of the water storage tank shall be smooth, clean & free from any moulding defects or other hidden internal defects such as air bubbles, pits and other foreign materials

II -2.2.3 Design & Dimensions –Design is as per the manufacturer's requirements and dimensions vary according to size and capacity of the tanks.

II – 2.3 Performance criteria of underground storage tanks

II – 2.3.1 The underground water storage tanks shall meet the following performance criteria when tested in accordance with Indian Standards IS 8543 (Part) & IS 13360 and as per Company Standards.

II – 2.3.1.1 Dimensions – There shall be no deviation > 1.50% of specified dimensions i.e. Dia. & Height.

II – 2.3.1.2 Visual appearance

- (a) Each component / assembly of the system shall be well finished with individual items properly fitted / assembled
- (b) All loose, fabricated items, pipe fittings etc. shall be checked for damages, if any

II – 2.3.1.3 Deformation Test – The difference between the circumferential measurement shall not be greater than 2% of the original measurements.

II – 2.3.1.4 Tensile Strength – The tensile strength of wall of water tank shall be min. 12 N/mm²

II – 2.3.1.5 Flexural Strength – The flexural modulus of the wall of tank shall be min. 300 N/mm²

II – 2.3.1.6 Fitment Test – Lid shall be secured properly on the manhole

II – 2.4 Size & Thickness – The underground tanks shall be available in various sizes. These are generally available from 1000 to 6000 litres capacity.

II – 3 Selection & installation

II – 3.1 The user/installer shall be responsible for the installation of the tanks as per the manufacturer's instructions as given in the literature of the product.

II -- 3.2 Choosing size and thickness –Appropriate size of the underground tanks shall be chosen to suit the requirements of the user.

II – 3.3 Handling – Underground tanks shall be carefully handled during storage and installation to prevent occurrences of damage to the faces & edges.

II – 3.4 Good practice for installation & maintenance shall be followed for installation of the underground tanks.

II –3.5 Installation instructions

II –3.5.1 A small pre-cast base, anchoring arrangements, proper backfilling & proper fittings shall be needed for installing a underground tank.

II –3.5.2.1 Place the tank inside excavated pit provided with RCC bedding. Backfill sand / gravel mixture and well compact

II – 3.5.2.2 Fill the tank with water in equal proportion to back fill

II – 3.5.2.3 Be certain to compact backfill under inlet & outlet pipes.

II – 3.5.2.4 When underground tank is filled fully with water, backfill to the surrounding level

II – 4 **Critical details to the use of underground water tanks**

II – 4.1 These tanks shall not be installed in excessive high water table areas.

II – 4.2 Do not install these tanks across path of vehicles of heavy equipment.

II – 4.3 These tanks are to be used as underground tanks only

II – 5 **Maintenance requirements** – No maintenance is required for these underground tanks. However, these tanks shall be installed strictly as per the instructions contained in the technical literature of the PAC holder.

II – 6 **Skills /Training needed for installation**

II – 6.1 Skilled / trained manpower is required for its installation

II – 7 **Guarantees/ Warranties provided by the PAC Holder-** This product is guaranteed for a period of one year from the date of supply against any genuine manufacturing defect provided the products are not subject to any damage whatsoever and are not abused/misused or wrongly installed. During the period of Warranty the products shall be serviced free of cost for any defect observed and subsequent to Warranty period services shall be done at a nominal service charge together with other incidental costs as mutually agreed by the PAC holder and the purchaser.

II – 8 **Services provided by the PAC holder to the customer**

II – 8.1 The PAC holder shall provide pre-sale advisory regarding the product. Customer/user may obtain from the PAC holder details of the advice that may be provided to him.

II –8.2 The PAC holder shall also provide after sales service on customer to customer basis. These include items like pre-

finishing, trouble in fixing and usage of underground water tanks. Users/Customers shall ascertain from the PAC holder the type of service and the conditions, the PAC holder is prepared to provide.

Part III Basis of Assessment and Brief description of Assessment Procedure

III – 1 Basis of Assessment

III – 1.1 The technical basis for assessment is as per the standards listed in Part V

III – 1.2 The assessment is based on the results & reports of

- (i) Inspection of the factory
- (ii) Inspection of the test equipment used and the test procedures followed in the laboratory of the factory
- (iii) Assessment of quality assurance procedures implemented in the factory
- (iv) Tests done in the factory during inspection
- (v) Tests done is in independent laboratory in random samples of the finished panels taken by the IO during inspection
- (vi) Inspection of underground water storage tanks (sump) in service

III – 2 Manufacturing process

III – 2.1 Raw Materials viz. Polyethylene & Black Master batch are stored and tested in the chemical laboratory

III – 2.2 Then extending & pulverizing processes are done

III – 2.3 These are then loaded in mould as per & weight of the machine

III – 2.4 R&R machinery processing is done

III – 2.5 Testing of moulded specimens is done in the QC lab for approval of Roto moulding

- III – 2.6 Roto moulding shop floor finishes & tested internally
- III – 2.7 Final inspection & transfer outside
- III – 2.8 Acceptance performance & type testing of underground tank
- III – 3 **Factory Inspection**
- III – 3.1 The factory was inspected by the technical representatives of the Council. During inspection the entire manufacturing process along with the equipment was inspected. The manufacturing process was found to conform to the process description given in the Annexure. The in-process inspection and the inspection of the finished panels were in accordance with the SQA approved as a part of the requirements for grant of this PAC. These were found suitable to produce underground storage tanks satisfying the criteria specified.
- III – 4 **Laboratory Tests done for assessment**
- III – 4.1 **Testing of samples**
- III – 4.1.1 **In the factory** – The tests listed in the report i.e. Visual appearance & Dimensional stability, Deformation, Tensile strength Flexural Modulus & Fitment of Lid were done by the IO in the factory on random samples of tanks taken by him for checking the product as well as related equipment. The tests were conducted using standard test methods specified by the PAC holder & tested in relevant clauses of IS 12701 – 1996. The samples passed in all the tests conducted
- III – 4.1.2 **In independent laboratory** – The following performance tests for underground water storage tank (sump) listed below were got done by an independent laboratory on random samples taken by the IO. The results are given in table below:

S. No.	Parameters	Performance Characteristics
1.	Overall Dimensions (a) Diameter	1200 mm

	(b) Height	1190 mm
	(c) Manhole Dia	400 mm
	(d) Total Height	1390 mm
	(e) Manhole extension	200 mm
2.	Visual appearance	Smooth, clean, No Visual defects
3.	Weight	48.2 kg
4.	Net Capacity	1040 lit
5.	Wall thickness	6.0 mm
6.	Deformation Test	0.81 %
7.	Impact Resistance	Not cracked or punctured
8.	Tensile Strength	18.6 N/mm ²
9.	Flexural Modulus	561 N/mm ²
10.	Fitment of Lid	Secured properly on the manhole

III – 5 Inspection & Supply of Installed tanks: - Details of the Underground water storage tanks supplied by the manufacturer are given below:-

S.No.	Occupancy/Building	Location of Building	When installed	Remarks /Condition of panels
1.	Aggarwal Trading Company	Dehradun	December 2008	Satisfactory
2.	Ashte Logistics Pvt. Ltd.	Chembur, Mumbai	October 2008	Satisfactory
3.	Radico NV Distilleries Maharashtra Ltd.	Aurangabad	November 2008	Satisfactory
4.	Orchid Infrastructure Developers Pvt. Ltd.	Gurgaon	October 2008	Satisfactory

PART - IV STANDARD CONDITIONS

This certificate holder shall satisfy the following conditions:

- IV-1** The certificate holder shall continue to have the product reviewed by BMBA.
- IV-2** The product shall be continued to be manufactured according to and in compliance with the manufacturing specifications and quality assurance measures which applied at the time of issue or revalidation of this certificate. The Scheme of Quality Assurance separately approved shall be followed.
- IV-3** The quality of the product shall be maintained by the certificate holder.
- IV-4** The product user should install, use and maintain the product in accordance with the provisions in this Certificate.
- IV-5** This certificate does not cover uses of the product outside the scope of this appraisal.
- IV-6** The product is appraised against performance provisions contained in the standards listed in Part-V. Provisions of any subsequent revisions or provisions introduced after the date of the certificate do not apply.
- IV-7** Where reference is made in this Certificate to any Act of Parliament of India, Rules and Regulations made there under, statutes, specifications, codes of practice, standards etc. of the Bureau of Indian Standards or any other national standards body and the International Organization for Standardization (ISO), manufacturer's company standards, instruction/manual etc., it shall be construed as reference to such publications in the form in which they were in force on the date of grant of this Certificate (and indicated in Part V to this Certificate)
- IV-8** The certificate holder agrees to inform BMBA of their distributors / licensees whenever appointed by him and agrees to provide to BMBA a six monthly updated list there of.
- IV-9** The certificate holder agrees to provide to BMBA feed back on the complaints received, the redressal provided, and the time taken to provide redressal on complaint to complaint basis as soon as redressal is provided. BMBA agrees to provide the certificate holder the user feed back received by it, if any.
- IV-10** If at any time during the validity period, PACH is unable to fulfill the conditions in his PAC, he should on his own initiative suspend using the PAC and notify Chairman, TAC the date from which he has suspended its use, the reason for suspension and the period by which he will be able to resume. He shall not resume without the prior permission of BMBA. He shall also inform, simultaneously, his agents, licensees, distributors, institutional, government, public sector buyers, other buyers and all those whom he has informed about his holding the PAC. He shall also inform all those who buy his product(s) during the period of suspension. He shall provide to BMBA at the earliest the list of who have been so informed by him.

501, Sector 29, Gurgaon
Haryana - 122002
Tel: 012-261-1100
Fax: 012-261-1101
E-mail: info@bmbs.com

IV-11 In granting this Certificate, BMBA takes no position as to:

- (a) The presence or absence of patent or similar rights relating to the product;
- (b) The legal right of the Certificate holder to market, install or maintain the product;
- (c) The nature of individual installations of the product, including methods of workmanship.

IV-12 BMTPC and the Board of Agreement of BMTPC (BMBA) take no position relating to the holder of the Performance Appraisal Certificate (PACH) and the users of the Performance Appraisal Certificate (PAC) respecting the patent rights / copy rights asserted relating to the product / system / design / method of installation etc. covered by this PAC. Considerations relating to patent / copy rights are beyond the scope of the Performance Appraisal Certification Scheme (PACS) under which this PAC has been issued. PACH and users of this PAC are expressly advised that determination of the Claim / validity of any such patent rights / copy rights and the risk of infringement of such rights are entirely the responsibility of PACH on the one hand and that of the users on the other.

IV-13 It should be noted that any recommendations relating to the safe use of the product which are contained or referred to in this Certificate are the minimum standards required to be met with when the product is installed, used and maintained. They do not purport in any way to restate or cover all the requirements of related Acts such as the Factory Act, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future, nor is conformity with the provisions of this Certificate to be taken as satisfying the requirements of related Acts.

IV-14 In granting this Certificate, BMTPC and BMBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.

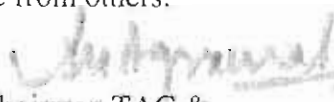
IV-15 The certificate holder indemnifies BMBA, its officers and officials involved in this assessment against any consequences of actions taken in good faith including contents of this certificate. The responsibility fully rests with the certificate holder and user of the product.

IV-16 The responsibility for conformity to conditions specified in this PAC lies with the manufacturer who is granted this PAC. The Board (BMBA) will only consider requests for modification or withdrawal of the PAC.

IV-17 The PAC holder shall not use this certificate for legal defense in cases against him or for legal claims he may make from others.

Place: New Delhi

Date of issue _____


Chairman TAC & _____ for and on behalf of
Member Secretary, BMBA

Dr. Shailesh Kr. Agarwal
Chairman, TAC
& Member Secretary, BMBA

Building Materials and Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation, (Govt. of India)
Corr 5A, 1st Floor, India Habitat Centre, Lodi Road,
New Delhi-110 003

Part – V List of Standards & codes used in Assessment

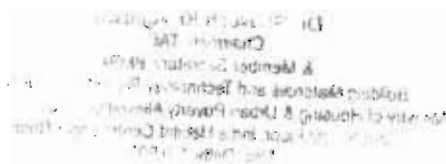
Part – V.1 Indian Standards - These Standards are referred for carrying out a particular test only and not specify the requirement for the whole product as such.

Part – V 1.1 IS 12701 - 1996 – Rotational Moulded Polyethylene water storage tanks – Specifications This Standard refers to the underground tanks for the parameters viz Visual, Deformation & Resistance to impact only.

Part – V.1.2 IS 8543 (Part 4) – 1984 – Method of Testing plastics- Determination of tensile properties

Part – V.1.3 IS 13360 (Part 5) – 1995 – Plastics Method of Testing - Determination of Flexural properties.

Part – V.2 Company Standards of the PAC holder – The branded design & specifications of the raw materials & finished product are as submitted by the manufacturer. The PAC holder has to make available the company standards to the consumers according to which testing has been done.



CERTIFICATION

In the opinion of Building Materials and Technology Promotion Council's Board of Agreement (BMBA), Underground Water Storage Tank (Sump) bearing the mark Manufactured by M/s Sintex Industries is satisfactory if used as set out above in the text of the Certificate. This Certificate PAC No. 6 /2009 is awarded to M/s Sintex Industries.

The period of validity of this Certificate is as shown on Page 1 of this PAC. This Certificate consists of a cover page and pages 1 to 19.



On behalf of BMTPC Board of Agreement

New Delhi, India
Place
Date

Chairman, Technical Assessment Committee (T AC) of
BMBA & Member Secretary, BMTPC Board of Agreement
(BMBA) Under Ministry of Housing and Urban Poverty
Alleviation, Government of India

Dr. Shailesh Kr. Agarwal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation, (Govt. of India)
Core 5A, 1st Floor, India Habitat Centre, Lodhi Road,
New Delhi-110 003

PART VI ANNEXURE

Annex VI-I

Abbreviations

BMBA	Board of Agreement of BMTPC
BMTPC	Building Materials and Technology Promotion Council
CPWD	Central Public Works Department
ED	Executive Director of BMTPC
IO	Inspecting Officer
MS	Member Secretary of BBA
PAC	Performance Appraisal Certificate
PACH	PAC Holder
PACS	Performance Appraisal Certification Scheme
SQA	Scheme of Quality Assurance
TAC	Technical Assessment Committee (of BMBA)

Performance Appraisal Certification Scheme - A Brief

Building Materials & Technology Promotion Council (BMTPC) was set up by the Government of India as a body under the Ministry of Housing & Urban Poverty Alleviation to serve as an apex body to provide inter-disciplinary platform to promote development and use of innovative building materials and technologies laying special emphasis on sustainable growth, environmental friendliness and protection, use of industrial, agricultural, mining and mineral wastes, cost saving, energy saving etc. without diminishing needs of safety, durability and comfort to the occupants of buildings using newly developed materials and technologies.

During the years government, public and private sector organisations independently or under the aegis of BMTPC have developed several new materials and technologies. With liberalization of the economy several such materials and technologies are being imported.

However, benefits of such developments have not been realized in full measure as understandably the ultimate users are reluctant to put them to full use for want of information and data to enable them to make informed choice.

In order to help the user in this regard and derive the envisaged social and economic benefits the Ministry of Housing & Urban Poverty Alleviation has instituted a scheme called Performance Appraisal Certification Scheme (PACS) under which a Performance Appraisal Certificate (PAC) is issued covering new materials and technologies. PAC provides after due investigation, tests and assessments, amongst other things information to the user to make informed choice.

To make the PACS transparent and authentic it is administered through a Technical Assessment Committee (TAC) and the BMTPC Board of Agreement (BMBA) in which scientific, technological, academic, professional organisations and industry interests are represented.

The Government of India has vested the authority for the operation of the Scheme with BMTPC through Gazette Notification No. 1-16011/5/99 H-II in the Gazette of India No. 49 dated 4th December, 1999.

Builders and construction agencies in the Government, public and private sectors can help serve the economic, development and environmental causes for which the people and Government stand committed by giving preference to materials and technologies which have earned Performance Appraisal Certificates.

Further information on PACS can be obtained from the website: www.bmtpc.org

ANNEXURE-

BUILDING MATERIALS & TECHNOLOGY PROMOTION COUNCIL

QUALITY ASSURANCE PLAN FOR WATER STORAGE TANK (SUMP)

S.N O.	PARAMETER TO BE INSPECTED	REQUIREMENT SPECIFIED	TEST METHOD	FREQUENCY OF TESTING
I. VISUAL				
I	Visual	a)Each component part/ assembly of the system shall be well finished with individual items properly fitted/assembled b)All loose, fabricated items/ pipes/ fittings etc. shall be checked for damages	Visual inspection	100%
II. PERFORMANCE TEST ON PRODUCT:				
1	Overall Dimensions	There shall be no deviation more than 1.5% of specified dimensions i.e. length, width, Dia., height etc.	Measurement by tape	5 per lot
2	Net Capacity	As per specification	By Water flow meter	Each lot
3	Hydrostatic Test	After sealing inlet/outlet pipes and filling with water, the water level after waiting at least one hour shall not drop	Filled up the tank 98% of its capacity and keep it on atmospheric pressure for 8 hrs.	each lot
4	Vacuum Test	After sealing inlet/outlet pipes and applying vacuum pressure of 100mm Hg, there shall be 90% of vacuum held for 2 minutes without any damage to the tank	Seal tank and apply 2 In..Hg. Vacuum and held it for 2 minutes	Each lot
5	Tensile strength	120 N/ mm ²	IS 8543 (P-4/ S-1)	Each lot
6	Flexural Modulus	300 N/ mm ²	IS 13360 (P-5/ S-7)	Each lot
7	Fitment of Lid	To secure properly on the manhole	By visual inspection	5 per lot
III. RAW MATERIAL				
1	M.F.I	2.0 to 6.0 gm/10 minutes	IS: 2530 - 1963	Once per lot
2	Density	932 to 943 kg/m ³	IS: 7328 - 1992	Once per lot