

FIRAT

POLYETHYLENE MANHOLE INSPECTION CHAMBERS

FIRAT

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FIRAT

FIRAT was established in 1927 to carry out production in construction materials sector. Setting off with the principles of “always high quality production” and “high quality product range”, FIRAT succeeded to become **“a leader company in its sector”** and **“leading exporter of the sector”** with major progresses it has achieved in Turkey in a short time.

FIRAT carries out production for various sectors such as construction, agriculture, automotive, medical and white appliances with its plastic based products. Carrying out its productions for these sectors in its modern factories located in Istanbul-Büyüçekmece and Ankara-Sincan, FIRAT owns one of the three largest production facilities in Europe.

According to 2011 data of Istanbul Chamber of Commerce, FIRAT has the 57th standing in the listing of Turkey’s 500 largest industrial organizations. FIRAT has the 51st standing in the private sector rating of the same listing. FIRAT is the 72nd organization which pays the highest amount of tax in Turkey. Taking the 117th place in the listing of “Turkey’s Highest Exporting Manufacturers 2011” of Turkish Exporters Assembly, FIRAT is the leading exporter of its sector.

As of end of 2012, FIRAT has 1700 employees. Adopting the understanding of “human is the most important asset”, FIRAT performs regular on-the-job trainings to improve both professional experience and provide corporate knowledge of the employees.



Product Variety and Groups

FIRAT, offers more than 4500 product varieties. FIRAT manufactures its products as integrated systems to ensure that customers ensure highest benefit and satisfaction with these products.

PVC Door and Window Profiles, PVC Gutters, PVC Clean Water Pipes and Fittings, PVC Waste Water Pipes and Fittings, PVC Hose Groups, Rubber and PE Based Hoses, PPRC Sanitary Installation Pipes and Fittings, PP Composite Pipes and Fittings, HDPE Pipes and Fittings, PP&PE Panels, LDPE Pipes and Fittings, EF Fittings, PE 80 Natural Gas Pipes, Drainage Pipes, Tunnel Type Drainage Pipes, Double-Wall Cable Conduits, EPDM Seal Production, Thousands of products of FIRAT offer in service at various locations of Turkey and throughout the world such as TPE Seal, Metal Injection (hinge and window fittings), PEX Mobile System and Floor Heating Pipes, PEX Pipes and Metal Fittings, Pex Al Pex Pipes, Sprinkler Pipes and Drip Irrigation Pipes.

FIRAT is the only company which manufactures all components that constitute PVC Window and Door systems except for glazing and screw in the world plastics sector. FIRAT manufactures all PVC Profile, EPDM Seal, TPE Seal, Support Sheet and Metal Accessories with integration in its own facilities since complete intercompatibility of PVC Windows and Doors can only be achieved through production at the same source.

FIRAT manufactures FKS sewage pipes which have a testable operating life up to 100 years. These pipes which can be manufactured up to a diameter of 3600 mm with HDPE (high density polyethylene) rawmaterial are resistant against seismic movements, reptiles, plant roots and chemical wastes. FKS pipes are manufactured with technology and under licence of German Kraih company.

Again manufactured in FIRAT facilities, Double Wall Triplex Pipes which are employed in outdoor installations and underground levels are mainly used in sewage lines and also for domestic connections, rain water drainage lines, industrial waste water installations, water conveying channels and drainage systems. Triplex Pipes have major advantages in terms of high flow performance, external load resistance, extended operating life, ease of shipping

and stocking, economy, resistance to chemicals, pricing and ease of maintenance, tightness and ability to install without wastage.

Firat developed FCS piping systems which is a new system with an operating pressure up to 10 bar to meet increasing high diameter and high operating pressure piping demand. FCS piping systems which ensure production of all pipes diameters at the range of 800 mm - 4000 mm have become a significant solution option for infrastructure needs with its lightweight, jointing with electro-fusion welding, easy and quick installation features.

FIRAT can perform rawmaterial analysis; source, torrent and wind strength, impact and jagged impact resistance, pressure, tensile and breaking strength, ring rigidity (resistance of FKS and Triplex pipes against soil load) in the most advanced test and analysis laboratories in the sector. Our products are only offered to the customers upon obtaining "Quality Approval".

FIRAT products which are subjected to all quality control products are offered to the market with "FIRAT Quality Assurance Certification". FIRAT is the only company in the sector who holds international quality certifications such as RAL, GOST, SKZ, BDS, SABS, EMI, DVGW, VDE, TSE and also all ISO/IEC 17025 accreditation, ISO 14001, OHSAS 18001, ISO 10002 ve ISO 9001 system certifications. Firat holds ISO 14001 Environment Management System certificate as a environmentally friendly manufacturer.

Products of FIRAT achieved customer satisfaction in more than 60 countries and got the standing they deserved.

FIRAT aims to utilize all of its resources, advance, grow and catch perfection and excellence with advanced technology for ensuring continuous customer satisfaction.

In line with the goals of perfectionism and excellence of FIRAT, our products are largely preferred due to features of reliability, ease of accessibility and after-sales support.



TRNC Water Supply Project

Another Innovation from Firat!

Having very limited aboveground water resources, almost the entire water demand of the TRNC is met through underground water resources. Water quality is derogating since underground waters which are polluted due to landfill areas that are close to water resources blend into potable water and water potential is reducing every other day.

Numerous projects were developed by Republic of Turkey, Ministry of Forestry and Water Affairs in order to meet water demand of TRNC, however, "TRNC Potable Water Supply Project" was implemented considering that a permanent water line shall be laid from Turkey to TRNC as the best method for a long-term solution. With this project, water to be supplied from Alaköprü Dam to be constructed in Turkey will be passed through the sea in a water pipeline and conveyed to Geçitköy Dam to be constructed in TRNC. Consisting of three stages as Turkey, sea passage and TRNC, the most critical stage of this project is "sea passage".

FIRAT has become the pipe manufacturer of TRNC Potable Water Supply Project by outpacing the world's most important 500 meter continuous HDPE Pipe manufacturers with its successful projects known in the world plastic literature, extensive engineering knowledge, experience, capacity and speed in PE Pipe production. of the region.

50 Years of Water Demand will be met!

In order to produce PE 100 pipes to be used for 80 kilometer line, within a short period as one year, FIRAT has built a production plant which has 3 large PE 100 pipe extrusion lines on a total area of 85,000 square meters with 5,500 square meters indoor area in Mersin-Ta_uçu-Seka Port site.

PE 100 pipeline to be established with "TRNC Potable Water Supply Project" is a unique application in the world with 80,151 meter long sea passage distance and suspended fixation at 250 meters deep..

25,000 tons of rawmaterial will be used in the project which will use a total quantity of 160 pipes with 1600 mm diameter, 500 meters of continuous length with operating pressures of PN 8 and PN 6.4 bar.

Planning to complete PE 100 pipe production until December 31st, 2013, this gigantic project will ensure delivery of 75 million cubic meters of water to TRNC, and TRNC will have a resource to meet 50 years of water demand.

Also to be used for irrigation purposes in addition to drinking, utility and industrial purposes, this resource will ensure irrigated farming on an area of 4,824 hectares and provide extensive contribution for the economic growth



Quality Assurance

FIRAT PE Inspection Chambers are manufactured as per TS 13598-2 standard with TSE certification.

Assurance FIRAT Quality assurance starts with application of tests required by the concerning standards and specifications on rawmaterial. Corrugated inspection chambers manufactured using rotational molding, spiral wound or fabrication methods are introduced to use upon the tests required by TS EN 13598-2 standard.



- TS EN 13598-2 
- ISO 9001
- ISO 14001
- OHSAS 18001
- EN ISO 10002
- TUV



Republic of Turkey
 Ministry of Public Works and Settlement
 Products with Pos Number Identification
 04.264/4B - 4/C - 4/D - 4E - 4F



PE Inspection Chambers

Polyethylene Manholes

Inspection Chambers shall be installed on the line in specific intervals to ensure regular and problem-free operation of infrastructure, rainwater, drainage and sewerage system lines of modern cities. Conventional inspection chambers employed in infrastructure and sewerage systems are being replaced by high-tech inspection chambers made of polyethylene due to lack of resistance to chemicals, heavy and bulky structure, production, handling, application and installation challenges. PE inspection chambers are widely employed in process water, return lines or water lines which require continuous circulation at industrial plants thanks to their superior features.

FIRAT PE inspection chambers are designed by taking all requirements of different infrastructure systems into consideration. In addition to standard types which have integrated ladder and are manufactured using rotational molding, Tailored - Fabricated Production method also uses numerous solutions for higher diameters and custom requirements according to your projects.

Advantages of PE Inspection Chambers

- Has a light and durable structure.
- Ensures easy and quick installation.
- Causes no installation and shipping wastage.
- Ensures 100% sealing.
- Environment friendly.
- Compatible with different piping systems due to its flexible structure.
- Comprises in various system parts which can offer different solutions.
- No secondary movements such as ground subsidence is observed.
- Has integrated ladder.
- Easily adjustable elevation setting.
- Surface structure with low roughness prevents adsorption.
- Has interior surfaces that facilitate perfect flow.
- Offers solutions suitable for all details required by your projects.
- Preferred particularly for high resistance to chemicals.
- Has highly economical Quality/Performance/Price ratio.

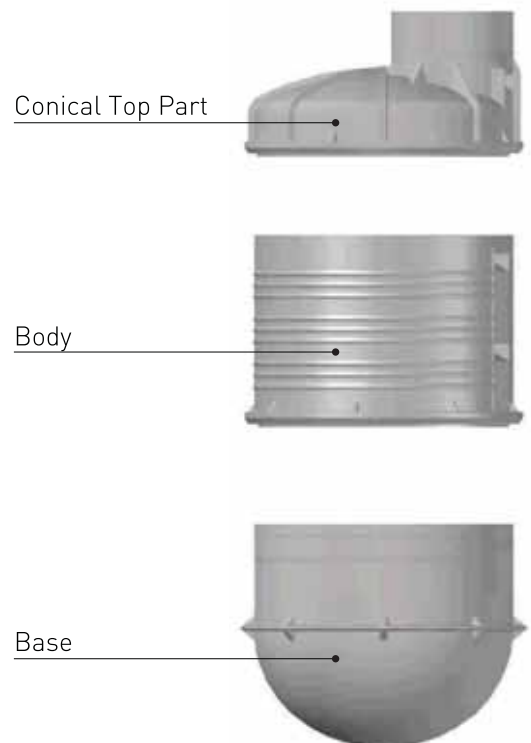
FIRAT PE Inspection Chambers ensure that the most suitable combination for the required height of your projects is realized and an economical solution is provided using conical top part, body and base members manufactured in different sizes using rotational molding technology.

FIRAT PE Inspection Chambers are manufactured using Rotational Molding Technology up to DN 1250 mm diameter and Tailored Manufacturing Method up to DN 2400 mm diameter as per TS 13598-2 standard.

Polyethylene inspection chambers have high chemical resistance. They are particularly preferred at areas with intensive corrosion and sealing requirements. Harsh chemicals which have a corroding effect with other materials in a short time do not impair the structure of PE material.

General Building Materials

Inspection chambers generally consist of 3 pieces.



Production Methods

Rotational Molding Technology - Rotation

PE raw material is melted under high temperature and production is realized employing special methods by shaping the piece with the form of the rotational mould. It hardens at the end of the cooling period and constitutes a member of the inspection chamber.



Tailored - Fabricated Production

Manufactured by cutting spiral or corrugated type pipes made of polyethylene according to the project design and joining them by using extrusion welding technique.



General Structure and Features



Has integrated access ladder.



Easily adjustable elevation setting using marked neck section.



Conical Top Part

Has an opening with min. 60 cm diameter to ensure human access.
Easily accessible, has integrated ladder with eccentric layout.
Has a strong body structure with tie piece structure.
Has high resistance to traffic loads.

Reinforced tie piece structure.



Body

Circumferential tie pieces on the body provide high resistance against lateral forces.
Easily accessible, has integrated ladder with eccentric layout.
Has high resistance to traffic loads.



Has integrated access ladder.



Base - Round Member

It is a universal member used in quantities of two or more, ensuring ease of access at different angles, jointed to the lowest level with parallel pipe welding and does not impair flow features of water.



Ease of access at different angles.

Base - Flat Member

In order to address different diameter applications at 180° access connections, inlets and outlets facilitate both gradual and corrugated and HDPE pipe connections.

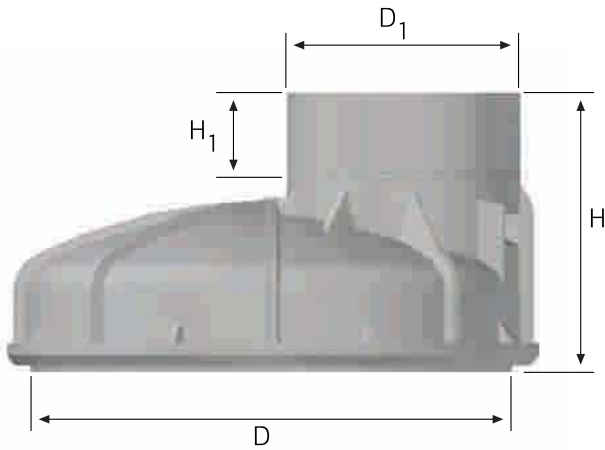


Angular base sides prevent accumulation.



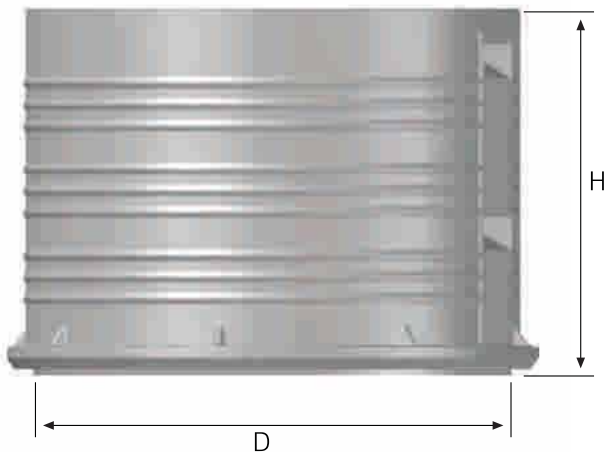
General Structure and Features

Round Based Inspection Chambers and Sizing Matrix



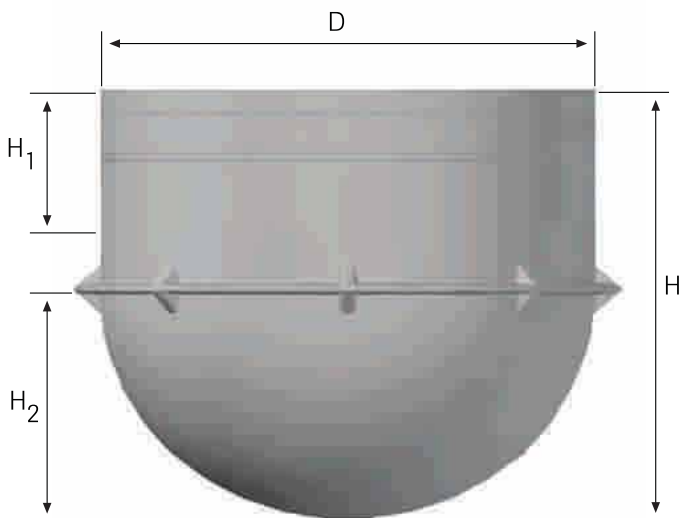
CONICAL TOP PART

	DN 800	DN 1000	DN 1250
D1 (mm)	600	600	600
D (mm)	800	1000	1250
H (mm)	500	750	750
	700	1000	1000
H1 (mm)	150	250	250



BODY

	DN 800	DN 1000	DN 1250
D (mm)	500	500	500
	1000	1000	1250

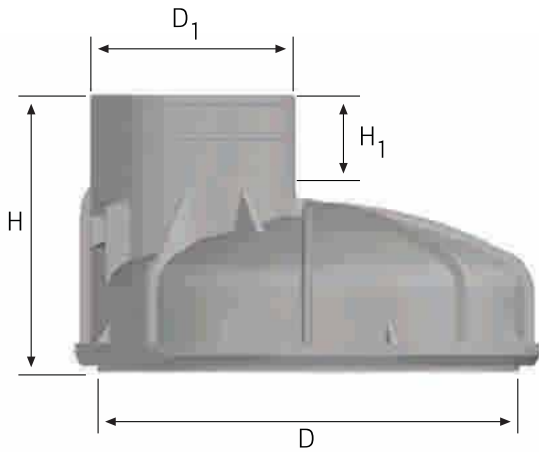


BASE - ROUND MEMBER

	DN 800	DN 1000	DN 1250
D (mm)	850	1055	1305
H	800	750	1250
		1000	
H (mm)	270	350	390
H2	430	545	670
H1 (mm)	ID100-OD400	ID100-OD500	ID100-OD560

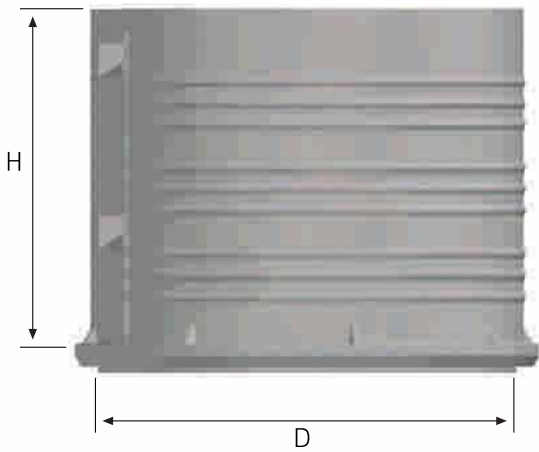
H₁: Section which can be cut for height adjustment during application.

Flat Based Inspection Chambers and Sizing Matrix



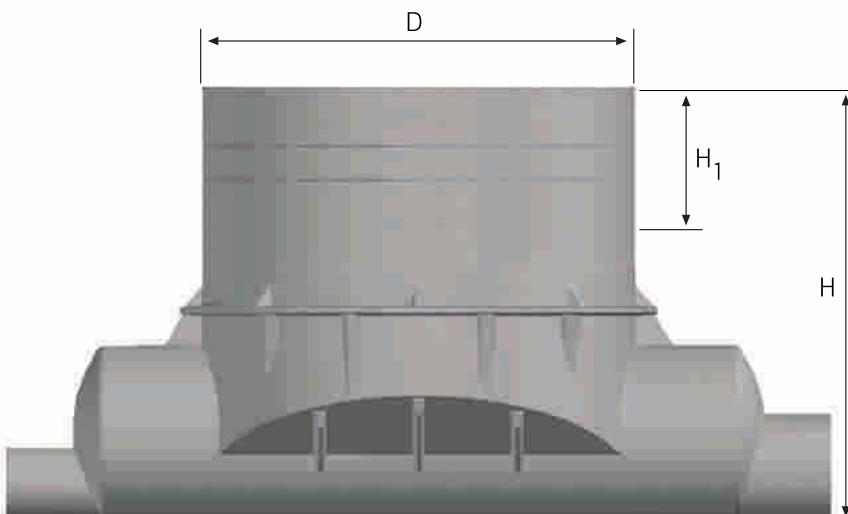
CONICAL TOP PART

	DN 800	DN 1000	DN 1250
D1 (mm)	600	600	600
D (mm)	800	1000	1250
H (mm)	500	750	750
	700	1000	1000
H1 (mm)	150	250	250



BODY

	DN 800	DN 1000	DN 1250
D (mm)	800	1000	1250
H (mm)	500	500	500
	1000	1000	1000



BASE - FLAT MEMBER

	DN 800	DN 1000	DN 1250
D (mm)	850	1055	1305
H	800	750	1235
		1000	
H1 (mm)	290	290	530
Inlet-Outlet Diameter Range	ID200	ID200	ID200
	ID300	ID300	ID300
		ID400	ID400
		ID500	ID500

H₁: Section which can be cut for height adjustment during application.

PE Inspection Chambers

Jointing Techniques



Ring on the inspection chamber shall be cut off primarily.



In sealed applications, seals compliant to TS EN 681 standard with TSE certification are installed to inspection chamber member.r.



Upon spreading liquid soap in conical top piece seal groove and seal surface, two pieces are joined.



Any welding operation with inspection chambers manufactured with rotational molding / fabrication technique can be performed with manual extruder.



Manual extruder melts the welding rod to join the surfaces together.



Extruder welding method procedure includes preheating using welding rod and spreading the molten state material on the welding area at a certain speed by applying pressure.

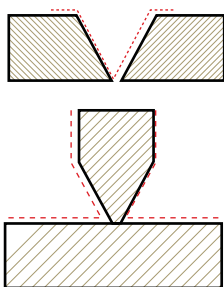


Welding Methods

Fillet Welding Application Methods

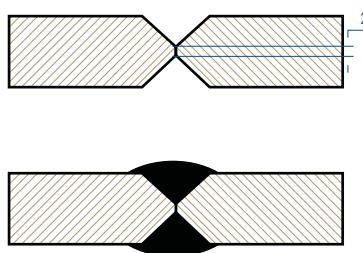
Fillet Welding Preparation

Fillet Welding Preparation Details



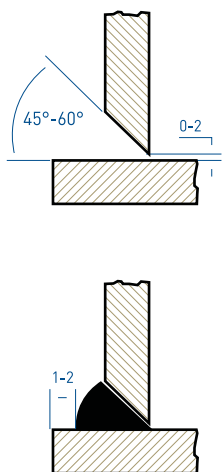
Fillet Welding Horizontal Part Welding Methods

Double Side Horizontal Fillet Welding Appearance



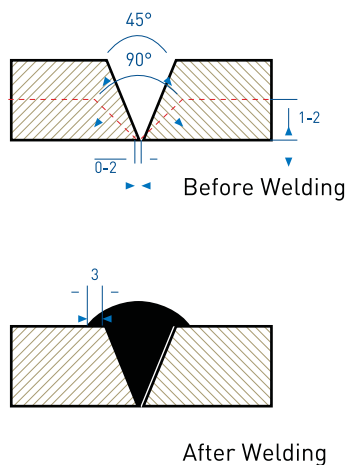
Fillet Welding Vertical Part Welding Methods

Single Side Vertical Fillet Welding Appearance



Fillet Welding Horizontal Part Welding Methods

Single Side Horizontal Fillet Welding Appearance



DVS 2207 Fillet Welding Parameters (Ambient Temperature 20°C)

Class of the Material to be Welded	Welding Force (N)		Welding Extruder Hot Air Temperature Value (°C)	Hot Air Flow Rate (l/min)
	3 mm welding rod	4 mm welding rod		
HDPE	10...16	25...35	300...350	40...60
PP	10...16	25...35	280...330	40...60

Output diameter of the hot air blowing tip of the extruder shall be 5 mm.

PE Inspection Chambers

Application Techniques

Fabricated Inspection Chamber Applications

Firat manhole systems are compatible with different piping systems in the market and custom inspection chambers suitable for your projects can be manufactured using fabrication method. Jointing of inspection chambers in a pipe system can be realized with welding, sockets or seals.



Inlet-outlet connection for various types of pipes such as HDPE corrugated, HDPE flat, PP and PVC can be performed easily.



Chute chamber joint.



Electrofusion welding joint.



Installation Application

- A pit is dug at the location to install the inspection chamber.
- Base of the pit is compacted and hardened.
- Excavation base is leveled using fine sand.
- Manhole chamber is placed on the smooth ground.
- Filling and compaction is performed in layers until the lower layer of pipe joint points.
- Chamber and pipe joint is performed according to the procedure.
- Filling and compaction process is continued in layers up to the cover level.
- Cover is placed and compaction is completed with the finishing layer (asphalt, concrete, paving stone etc.)



PE Inspection Chambers

Application Techniques

Silo and Tank Applications

Silos and tanks manufactured from PE material are employed in many industrial plants within requirements that stipulate hygiene and chemical resistance attributes.



Aspects to be Considered in Applications *

- Welding operation shall not be performed under 5°C or if such is inevitable, welding environment shall be heated up to minimum 5°C.
- Material of the piece to be welded and welding rod shall be of same class polymer.
- Diameter of welding electrode shall be 3-4 mm.
- Welding surfaces shall be clean. Irregularities which may impair welding quality such as oil, dust, soil etc. shall be cleaned prior to the welding operation.
- Welding surface shall always be scraped at surface preparation stage and oxidized layer shall be eliminated.
- Beveled welding groove shall be established.
- Manual Welding Extruder shall always be kept at an angle of 45° to the welding surface.



* Pre-welding shall be performed by using 4 mm welding rod for large and deep welding operations then it shall be followed with second or if required, third welding operations using welding rods with suitable size and shape. Welding zone shall cool down before applying the succeeding welding layer.

PE Inspection Chambers

Technical Specifications

1.SCOPE

These specifications define the technical and physical attributes of inspection chambers made of polyethylene rawmaterial to be used in gravity sewerage and rainwater drainage lines.

2. GENERAL CONDITIONS

Only companies that hold ISO 9001 Quality Management System Certificate, ISO 14001 Environment Management System Certificate and TS EN 13598-2:2011 certificates can bid in tenders opened by the public procurement authority.

3.TECHNICAL FEATURES

Surface Quality

Surface of polyethylene inspection chamber shall be black and homogenous. Cutting points shall be smooth and not contain burrs that hinder the functions of the inspection chamber.

Resistance Against Buoyancy Forces

Inspection chamber body shall have transverse tie piece structure to withstand the buoyancy force that can be created by underground water.

Ladder

Inspection chamber manufactured by using Rotational Molding shall have integrated ladder.

Sealing Member

Seal to be used shall conform to TS EN 681 standard and have TSE certification.

Inspection Chamber Jointing

Conical top piece, body and bases shall be suitable for sealed jointing and extrusion welding.

Dimensions

Inlet-outlet, diameter, angle and height of the inspection chamber shall be as follows.

Nominal Diameter (mm)	Inlet-Outlet Diameter (mm)	Angle (°)	Height (m)

4. TESTS

Following tests shall be performed on the samples taken from polyethylene inspection chamber body.

Density

Density of the sample taken from the inspection chamber shall be minimum 0.930 gr/cm³.

Joining Point Tightness

No leakage shall be observed when 0.5 bar water pressure is applied on inlet outlet joints of the inspection chamber for 15 minutes.

Impact Test

No breakage, cracking or deformation which may impair the function of the base shall occur when a 1 kilogram mass with $r=50$ mm radius is dropped on the inspection chamber base member at an angle of 23 ± 2 °C from 2.5 m height.

Vertical Load Test

Flexion shall not be greater than 10 mm when 20 kN vertical load is applied on the ladder of the inspection chamber body.

Tightness Test

Tightness test shall be performed by covering inspection chamber inlet and outlets with suitable caps and filling water up to the top level of the chamber for checking any leaks at the joints.

5. CHECKS**Taking Sample**

Inspection and tests of the products randomly selected from the batch presented for the acceptance of the procurement commission shall be performed at the laboratory of the manufacturer company.


Laboratory test devices shall be of sufficient capacity to perform the tests and have calibration certificates.

Manufacturing Inspection

Tender authority may perform manufacturing inspection any time at the production facilities of the awarded company.

Marking

Details to be included on each inspection chamber that is manufactured.

- Name or logo of the manufacturer company.
- Nominal diameter information.
- TS EN 13598-2 inscription and logo. 
- Inlet-outlet diameter details.
- Production year details.

Storing

Storing area shall be cleared of pointed rocks and stones which may damage the inspection chambers. Superposed and irregular stacking which may cause deformation of the inspection chamber shall be avoided.

FIRAT sells to a lot of Countries in Europe, Asia and Africa

Countries to which FIRAT exports:

Afghanistan	Hungary	Palestine
Albania	Iceland	Pakistan
Algeria	India	Poland
Armenia	Iran	Portugal
Azerbaijan	Iraq	Qatar
Bangladesh	Italy	Romania
Bahrain	Jordan	Russia
Belarus	Kazakhstan	Saudi Arabia
Belgium	Kenya	Serbia
Bulgaria	Kosovo	Slovakia
Bosnia and Herzegovina	Kuwait	Slovenia
Brasil	Kyrgyzstan	South Africa
China	Lebanon	Spain
Croatia	Latvia	Sudan
Czech Republic	Libya	Sweden
Denmark	Luxemburg	Syria
Dubai	Macedonia	Tajikistan
Egypt	Maldives	Tanzania
England	Malta	Tunisia
Ethiopia	Moldova	Turkmenistan
France	Montenegro	Ukraine
Gabon	Mongolia	United Arab Emirates
Gambia	Morocco	Union of the Comoros
Georgia	Netherlands	Uzbekistan
Germany	New Zealand	Yemen
Ghana	Nigeria	
Greece	TR of Northern Cyprus	