



PERMANENT ENVIRONMENT PROTECTION

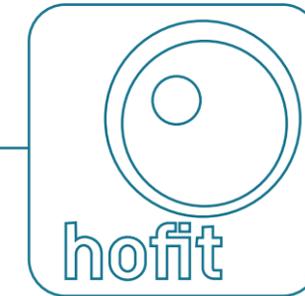


HOFIT HDPE MANHOLE



The droplet that led to HOFIT's wave of success was generated more than 30 years ago

In 1978 HOFIT invented a new eco-friendly concept for the inspection of sewerage and drainage systems:
the polyethylene manhole

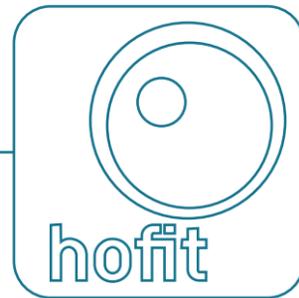


Liquid Gold

HOFIT conceived, designed and produced the first polyethylene manholes over than 30 years ago with the aim of protecting the environment and its water sources: it was an innovative product which, thanks to its impermeability, protects the environment from pollution.

The market has proven that HOFIT was right, and the company is currently a leader in the waste water collection and treatment systems sector: **6 production lines in 2 factories employ more than 150 people; 600 molds offer a range of more than 2,000 different models;** a production of more than 60,000 items a year, with a presence in 24 countries worldwide.

These figures highlight an undisputed and continuously renewed leadership, thanks to continuous R&D activity and attention to the market, thereby **guaranteeing innovative and increasingly market oriented products**. The know-how achieved has enabled HOFIT to constantly cooperate with the Standards Institutes in many countries, worldwide.



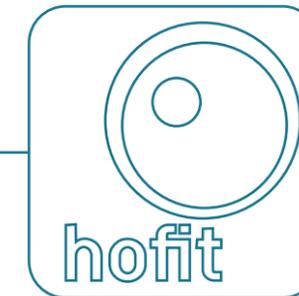
Water & Environment Protection

A company philosophy focused on Water and the Environment Protection has resulted in the HOFIT R&D departments selecting high density polyethylene (HDPE).

Impermeable and impenetrable: the HOFIT manhole guarantees the definitive physical separation between the flow and the environment, thereby protecting the environment from pollution due to wastes from domestic and industrial activities.

Strong, long-lasting and recyclable: the HOFIT HDPE manhole is not subject to corrosion or cracks and it adapts to any earth subsidence. Its high chemical resistance and the absolute non-toxicity are the qualities which make polyethylene ideal for operating in the environment without adversely affecting the system.





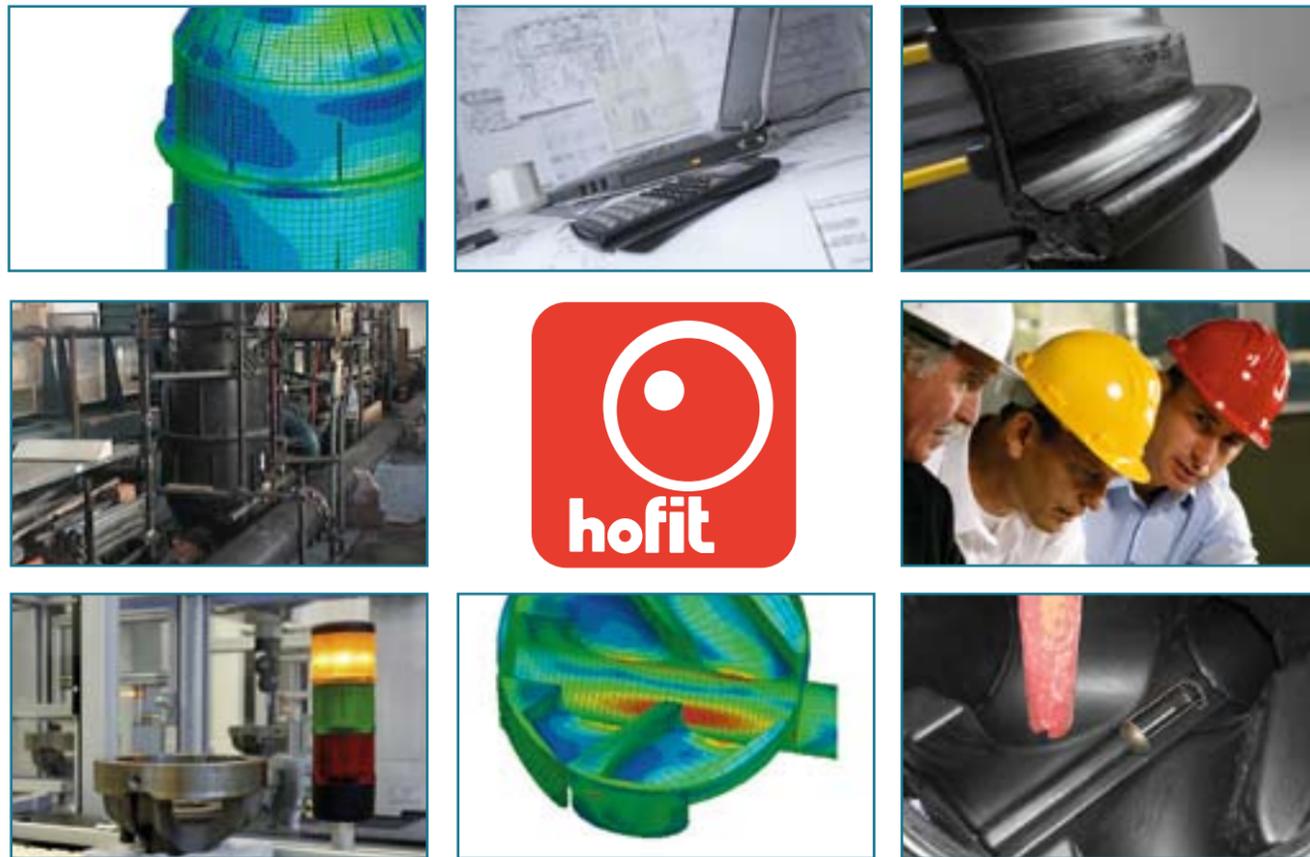
Quality, Service & Innovation

First to be first: being first and, above all, maintaining its leadership is a challenge, which the brilliance of **HOFIT's** original idea has made **a winning solution for more than 30 years**. **HOFIT's** leadership results from significant investments in the quest for innovative products. We may no longer be the only Company on the market, but we still think we are the best.

HDPE MANHOLES ARE OUR CORE BUSINESS

Our strength is to have positioned the polyethylene manhole at the center of our business, focusing on technologies which guarantee the quality of the product, thereby achieving a level of knowledge of the product which is second to none.

In **HOFIT** we invented the polyethylene manhole and we now guarantee its quality through close control of the production stages, whilst maintaining a process of **continuous improvement**, thanks also to the constant attention we pay to our Customers.



Quality

INTEGRAL QUALITY

Quality of raw materials:

High quality **virgin HDPE** is purchased only from certified firms, which meet the strict specifications imposed by **HOFIT**. An in-house laboratory carries out further quality controls after the materials have been received.

Design quality:

Highly skilled personnel with 30 years' experience continuously develop innovative and functional new models. Sophisticated instruments for simulation of the conditions, which the product must withstand after installation, are utilized throughout the design phase.

Quality of finished product:

The production processes are automated and certified in accordance with **ISO 9001-2000** in order to guarantee constant quality; the two quality control laboratories ensure that specific random tests are carried out to check and guarantee over time the performance of the **HOFIT** products, such as the required ring stiffness, internal pressure, vacuum, durability, etc.

The **HOFIT** products are also certified by accredited certification institutes in accordance with the most recent European Standards, including the **EN 13598 - 1** and **EN 13598 - 2**

Service

THE CUSTOMER ALWAYS COMES FIRST

The **service to the Customer** starts with design of the manhole and only ends after installation of the product:

Technical support helps the Customers select the most suitable manhole for their particular requirements. **Customers will always find the answers they are looking for, by contacting HOFIT;**

Personalized projects are provided for those who require specific, tailor-made solutions;

Traceability is guaranteed back till the raw material purchased. A detailed description of all the products delivered at site is handed over to the Customer and the Site Management personnel, together with the documents required for quality certification.

Innovation

R & D AT THE FOREFRONT

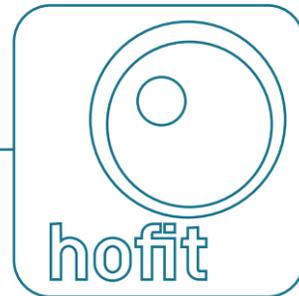
Internal R&D:

Innovation starts at the **HOFIT** premises where the team of engineers, technicians and scientists are working to improve and modernize the quality of the products with the environment care in one hand and the Customer's needs in the other.

External R&D:

Constant and well established collaboration with external research institutes and international universities is a further incentive towards progress and technological innovation, as well as the extra value which makes every **HOFIT** product unique and always a step ahead of its competitors.





Polyethylene vs. Concrete

CONCRETE

It is difficult to exactly define the origins of construction techniques using concrete, as it appears that the Assyrians and the Egyptians were already building structures using aggregate materials. Even the invention of cement dates back to the 3rd millennium B.C.

POLYETHYLENE

1898: Polyethylene was first synthesized by accident by the German chemist Hans von Pechmann.

1933: The first industrial synthesis was accidentally discovered by Eric Fawcett and Reginald Gibson.

1939: Industrial production started at ICI Chemicals.

Polyethylene in hydraulic systems reached and exceeded concrete in terms of reliability, performance and, above all, respect for the environment in just over a century.

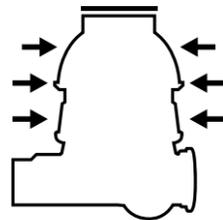




Watertight



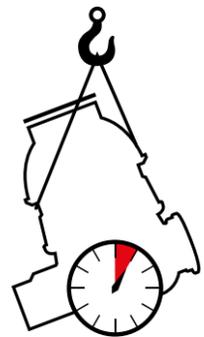
Impact resistant



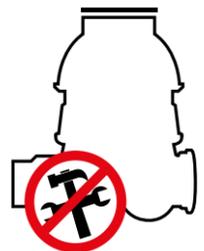
Strong



Light



Fast installation



No maintenance

Polyethylene



Greater efficiency

Perfect water tightness: Practically guaranteed for life, the cases of infiltration are reduced to a minimum. Protection against possible increases in the groundwater level is ensured; the quality of the gaskets is guaranteed to withstand internal and external pressures of up to 0.5 bar.

Resistance against every type of attack: Impenetrable even when they are subjected to the action of the chemical agents present in the ground or in waste water; stable even in the case of abrasions or mechanical stresses.

Strength and flexibility: The considerable adaptability to any ground and its natural subsidence prevents and reduces the possibility of failure; the stability criteria comply with the severest international earthquake standards.

Reduced costs

Easy installation: The significantly lower weight of the elements (on average 30-40 kg) enables simple and fast installation. Transport costs are lower; it is not necessary to use heavy machines even in limited spaces or in difficult ground conditions; the installation time is much shorter.

Adaptability: The manholes are designed so that they can be connected to every type of pipe; it is also possible to connect a pipe long after installation, as only 100% virgin HDPE is used.

Lower maintenance costs: Chemical resistance and durable seal. Once installed, HDPE manholes do not require maintenance for a very long time.

Concrete



Lower reliability

Insufficient seal: The manhole is critical for the quality of the sewerage system. Accredited studies confirm that more than 50% of the concrete manholes installed are not watertight; there are many and often inevitable problems of infiltration from the groundwater towards the network or, even worse, of pollution from the network towards the outside environment.

Resistance not guaranteed: Internal corrosion phenomena are possible; chemical agents may damage the surfaces, especially in the presence of particularly aggressive soils or waste water.

Short-term strength: Modifications, vibrations, ground subsidence and significant temperature variations may result over time in cracks and splits; the consequences of this instability are harmful both for the environment and for the water flow.

High and unpredictable costs

Difficult installation: 1 meter high manholes of 1 meter diameter may weight up to 1 ton. They are often made from several elements but, even if they are lifted singularly, they still have a considerable weight. The transport and handling difficulties, the installation time as well as the safety requirements increase and with these the overall costs.

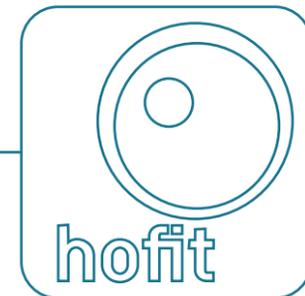
Continuous maintenance: Subsequent interventions are made necessary by the use of a material, which does not guarantee the fundamental watertightness, resistance and strength qualities. Over time, there is inevitably an increase in the need for both routine and major unforeseen maintenance operations.



Monolithic



Elements



Wide Range Infinite Combinations

The Hofit flexible and multifaceted system satisfies any possible need: the vast assortment of products is designed and manufactured to combine into a wide range of configurations, which offer the most reliable and economical solution even for the most complex projects.

HOFIT offers a complete and innovative range specifically developed along two parallel concepts:

THE MONOLITHIC SYSTEM
Simple and Fast

THE ELEMENTS SYSTEM
Adaptable to site conditions

making sure that the best option is always available to its Customers to satisfy the project requirements.

Elements



The manhole is conceived as a combination of separate elements to be assembled on site.

The advantages of this solution are that it may be adjusted to meet the specific site requirements and it is very easy to use. The parts are all marked with the exact height and they can be assembled on site by low skilled personnel.

Mechanical equipment is not needed for lifting and handling. Water tightness is guaranteed up to 0,5 bar by EPDM gaskets.

IT IS SUITABLE FOR INSTALLATION WHERE:

- Unmapped networks are present
- Space is tight
- Design is incomplete or uncertain
- Access for heavy machines is difficult



Both systems provide an adjustment cylinder on the top of the manhole; together with the concrete slab they allow for adjustments of up to +/- 30 cm to the new road level.



Monolithic



The manhole is supplied in a combination of elements already assembled and welded at the factory.

The advantages of this solution are the speed of installation and the ease of storage. This is the preferred choice on any green field project sites.

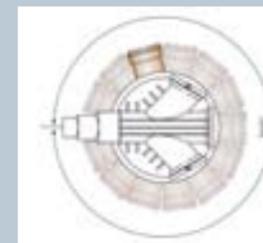
Lightweight machinery is sufficient for the lifting and handling. Water tightness is guaranteed up to 0.5 bar by extrusion welding, carried out by skilled and certified personnel.

IT IS SUITABLE FOR INSTALLATION WHERE:

- Groundwater may be present
- There is a time constraint
- The workforce is unskilled
- It is a new project site



Both systems allow for connections to be made up to a diameter of 200 mm around the entire circumference by using a simple cup wheel cutter.



Elements



The multitude of possible combinations between **BASES**, **ELEVATION** elements and **TOP** elements, which are all available in a wide range of **DIAMETERS**, make it possible to fully satisfy the Customer's needs:

BASE Elements

STRAIGHT CANAL BASE: suitable for linear sections, installed normally every 50 meters to enable easy cleaning with water jets.

ANGLED CANAL BASE: to allow inspection at changes of direction, where clogging and obstructions are possible. (available with 15°, 30°, 45°, 60°, 75°, 90° angles, in both right and left directions).

2-3-4 or 5 INLETS BASE: for inspection at the confluence of secondary lines.

MULTI-INLET BASE: to create an inspection chamber when one or more users have to connect even at a later stage and at any angle without any constraint.

SPHERICAL BOTTOM BASE: to create an inspection chamber where it may not be made with standard bases.



UPPER UNITS

The upper unit may be supplied with open top diameter of 600 mm, 630 mm or 700 mm in two different versions:

- Concentric cone
- Eccentric cone

These may in turn be supplied in 4 different types:

- Without ladder
- With integral PE ladder
- With GRP or Stainless Steel ladder

For safety reasons, the first step is always fitted 50 cm below ground level.

The elevations for models with a diameter up to 630 mm are supplied with variable heights.

Elevations with 800 mm, 1000 mm and 1250 mm diameters may be supplied with heights of 500 mm and 1000 mm, again in 4 different versions according to the chosen type of ladder.



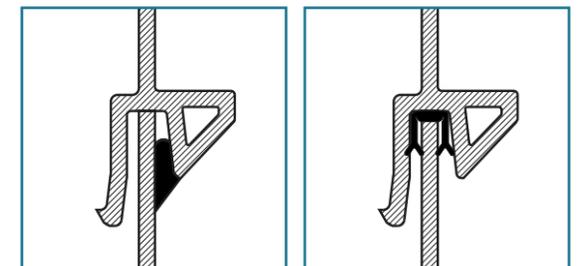
THE LADDERS: EXTRA SAFETY

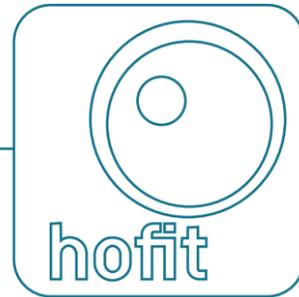
Maximum safety for the operators: compliance with EN 13598 standards guarantee the quality and safety requirements of the ladders.



GUARANTEED JOINT

The coupling system guarantees water tightness up to 0.5 bar by using **HOFIT** "JG" type double lip EPDM gaskets or by extrusion welding carried out by skilled and certified personnel.



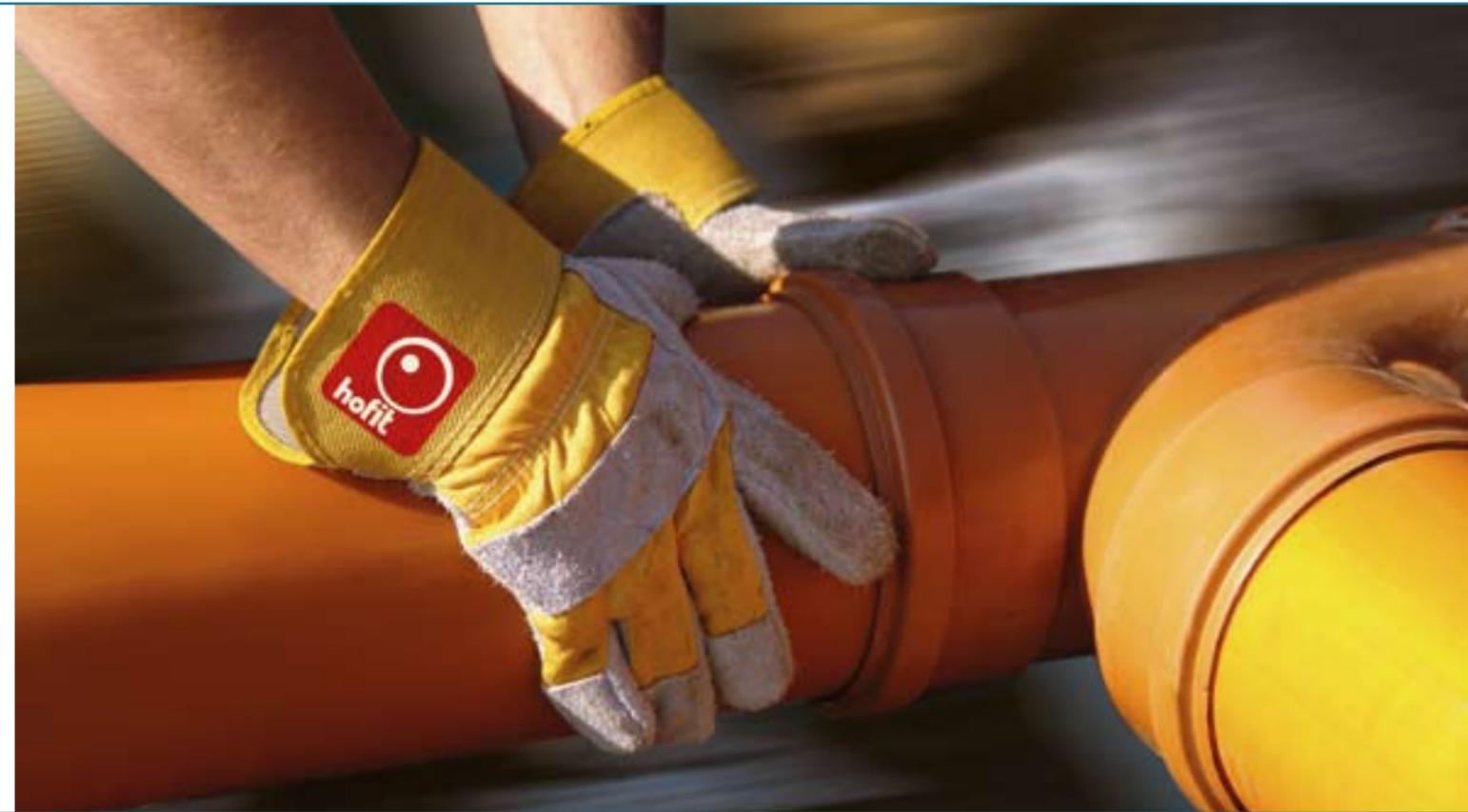


Adaptability and Flexibility

More than 30 years in the business, focusing its Technological Expertise on Inspection Chambers allow HOFIT to be free from any constraint, which might arise if it would also be producing Pipes.

Constant commitment ensure that HOFIT is always up to date with the most modern technologies and standards for sewerage systems. With the backing of the Engineers and Marketing Managers, HOFIT researchers cooperate with the most important international pipe manufacturers, to ensure that the most suitable and safe coupling system is always available.

Whether polyethylene, polypropylene, clay, cast iron, fiberglass or PVC pipes are used, the HOFIT manhole is able to provide the necessary compatibility to guarantee success for the Customer's project.



Connections To Any Network

Thanks to its focus on manhole technology, **HOFIT** leaves the designer completely free to choose the materials to be used for the sewerage system; the **HOFIT** manholes may be connected to any type of pipe selected for the network. The use of the **HOFIT** manholes does not affect the design choices for rest of the system. Pipes with nominal diameters of 160 mm to 600 mm may be connected depending on the type of pipe and the type of manhole.

The designer may select the most suitable pipe, supported by **HOFIT** technicians, who are available to assist the Customer in the development of the best design.

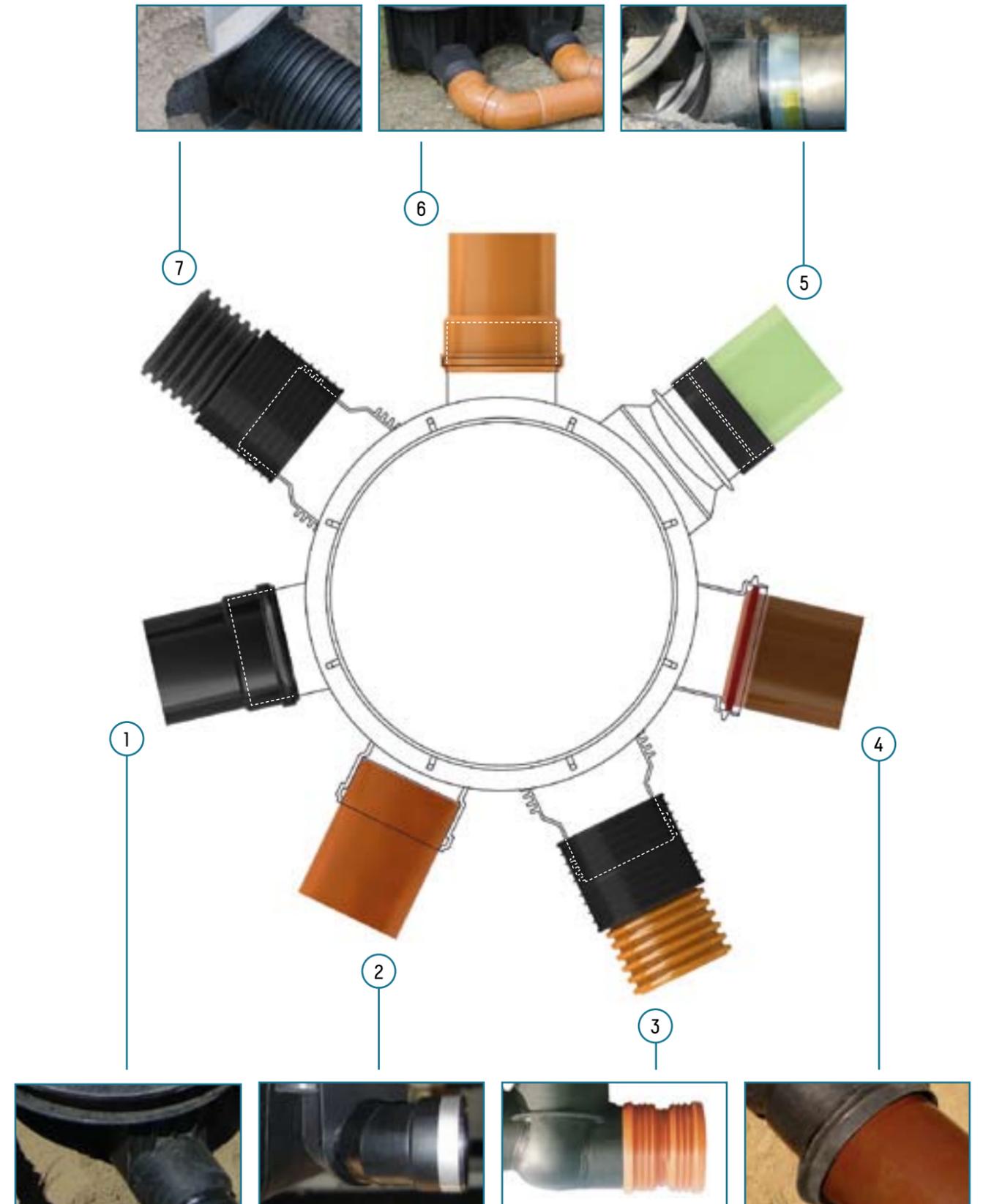
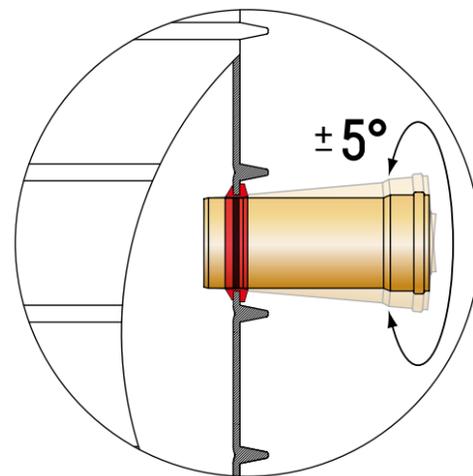
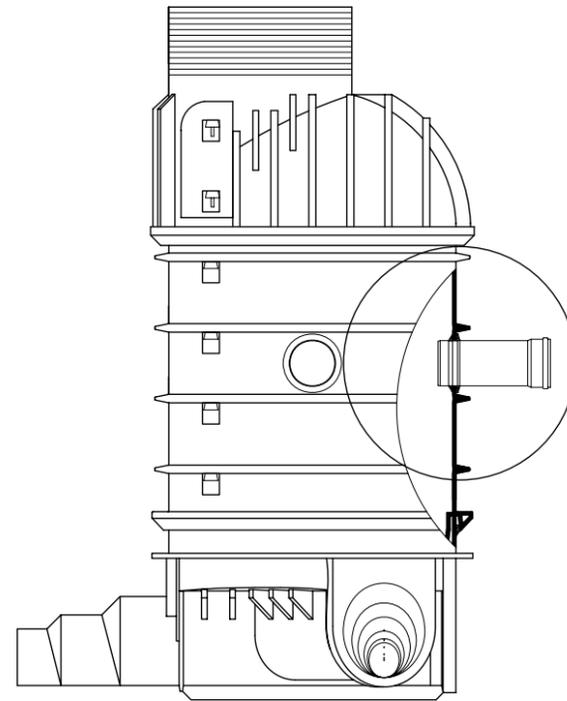
**ADAPTERS AND GASKETS ARE AVAILABLE
OR THE FOLLOWING TYPES OF PIPES:**

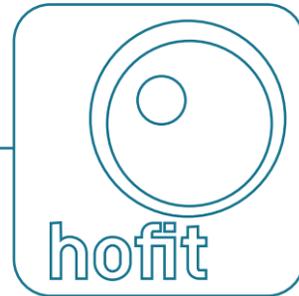
- 1) POLYETHYLENE
- 2) CAST IRON
- 3) POLYPROPYLENE
- 4) CLAY
- 5) GRP (FIBERGLASS)
- 6) PVC
- 7) CORRUGATES PIPES

The sleeved couplings of the PVC and HDPE pipes may be directly fitted in the manholes as required by European Standards.

The current range of adapters and gaskets is being continuously expanded and developed in order to satisfy the needs of the innovations constantly introduced to the market.

The **HOFIT** gaskets may compensate for misalignments of up to 5° in all directions; they are easy to install and safe thanks to their double lip design. Water tightness under a pressure of 0.5 bar or a vacuum of 0.3 bar is guaranteed, thereby complying with the requirements of EN 13598-2 standards.

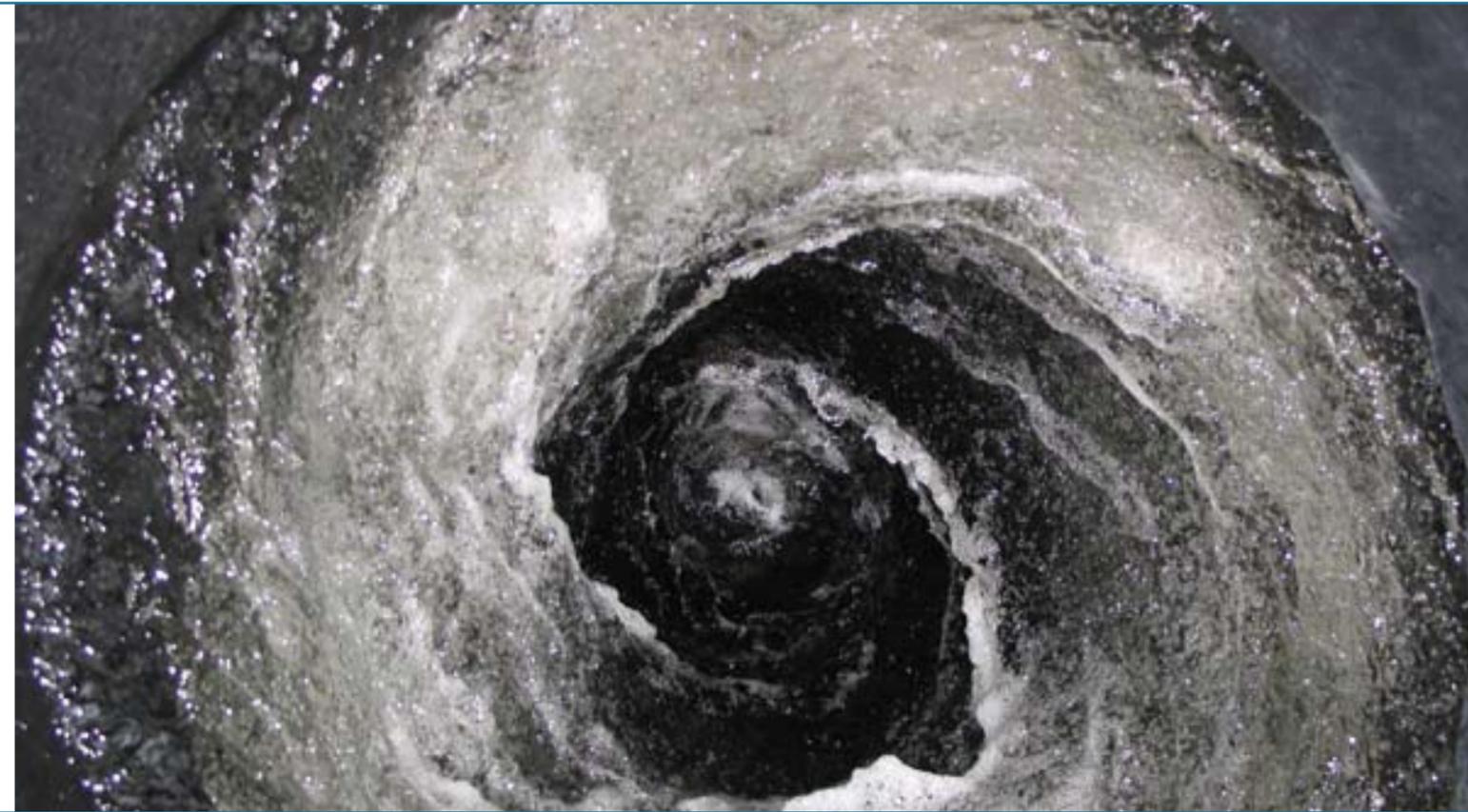




Special Applications

The use of man made concrete structures, which are often of very poor quality, is the origin of many of the problems which occur on drainage networks. They are often caused by the wrong concept that the manhole is a minor accessory needed to inspect the lines.

The HOFIT polyethylene manhole has a technological content that often makes it an indispensable tool for the correct operation of the network. Without it, phenomena with serious consequences could occur, such as flooding and even landslides.



Installations in the presence of steep slopes

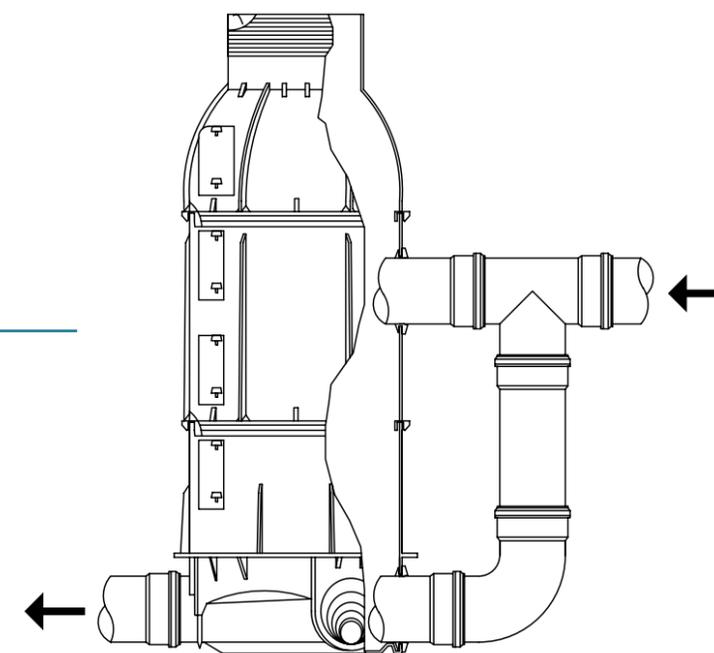
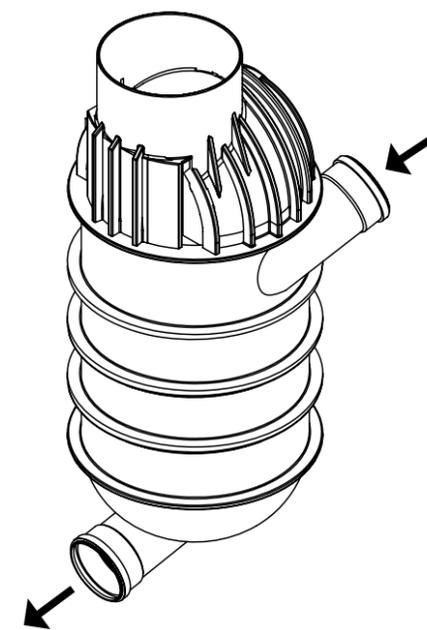
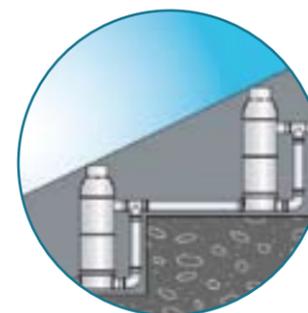
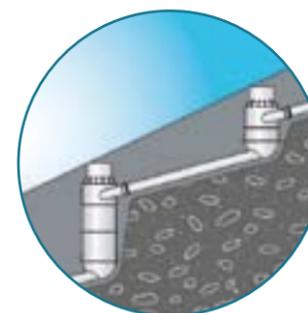
When the ground is actually a steep slope, the drainage system must keep the flow rate in the pipeline within the provisions of the relevant Safety Standards. Normally, flow rate must be not more than 4-5 m/s.

HOFIT is able to provide two systems:

Innovative VORTEX DROP system: This exploits the centrifugal force to create a controlled turbulence and release the kinetic energy necessary to maintain equilibrium between the upstream and downstream conditions. Special devices also enable to break the flow at the outlet, thereby guaranteeing a laminar flow.

DOUBLE DROP system with an inner and outer drop: In the case of limited flows, the sewage drops down at the inlet tee and flows in the main channel; in the case of high flows, part of the sewage will drop at the tee, whilst the remaining part will enter directly into the manhole to create a dynamic load which increases the piezometric level.

The big advantage of the **VORTEX DROP system** is the greater efficiency compared with a traditional drop. Less drops are necessary. The pipeline can be parallel to the ground hence reducing excavation; the final result is a better performance at a lower overall cost.



The Hofit dissipation chambers have been developed through the cooperation with leading research institutions.

Pumping Stations

The HOFIT HDPE manhole represents the ideal solution for the installation of pumping stations.

The HOFIT manhole may be equipped to house submersible pumps, thereby transforming itself into a **true ready-to-install pumping station**. It is the ideal solution as it reduces the installation time and solves the problems caused by the possible presence of groundwater.

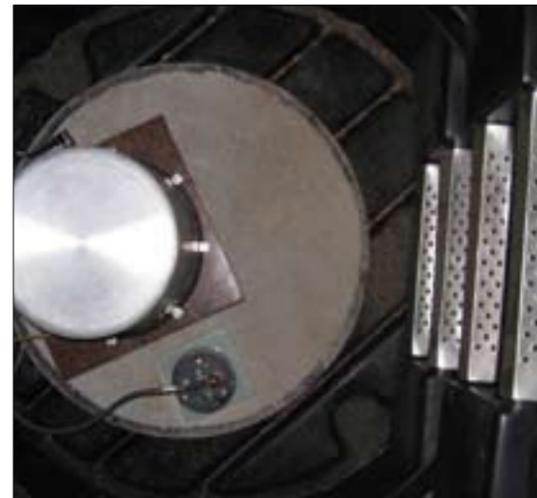
The manhole is delivered as a **monolithic unit**: all the equipment is pre-assembled and the installation is quick and safe.



Manholes for Instrumentation

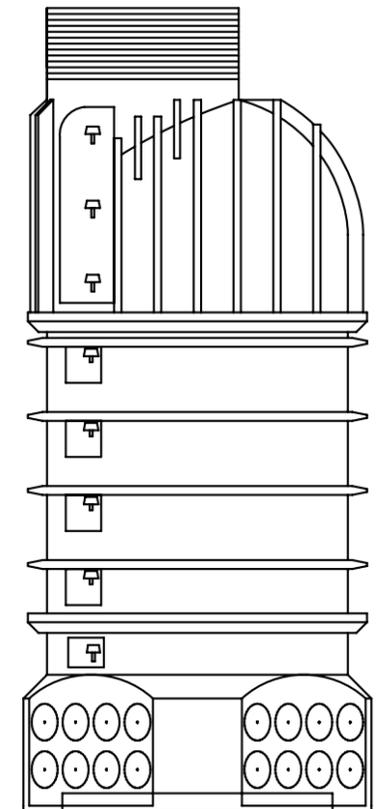
The HOFIT manholes, in this case fitted with a flat base and, if necessary, with suitable internal brackets, may be used for the installation of special instrumentation.

The typical application is for flow-meters. The manhole is fitted with steps to facilitate inspection; a polystyrene disc ensures thermal insulation.



Communication Manholes

Another typical application of the HOFIT manholes is for junction or inspection chambers for communication lines or cable ducts. Again, the large range offered by the HOFIT catalogue can satisfy all Customers' needs.



Hofit Service for installation in difficult situations

Technological innovations and carefully designed details guarantee the maximum stability and versatility of the HOFIT manholes, under various installation conditions.

Any unforeseen occurrence or specific need, which may not be dealt with using standard solutions, receives the maximum attention from the HOFIT Technical Support Department, which is always available to the Customers.

Custom made designs and products, based on the Project's needs, are an integral part of the Customer Service provided by HOFIT.

Road Gullies

Attention to the market needs and the commitment of **HOFIT's** designers have enabled a reliable and innovative range of products to be developed for the construction of rainwater drainage systems.

Road gullies are available in a wide range of configurations, from 200 mm to 400 mm diameter.

HOFIT road gullies and drains have a smooth inner surface which is free from edges, a semispherical base and a series of design features, all based on **HOFIT's** experience and know-how. This all helps to prevent clogging, limits evaporation, avoids unpleasant odors and it guarantees the performance of the system in accordance with the most demanding standards.

Another typical feature of the **Hofit** gullies is the special gasket, which seals the top end avoiding accumulation of dirt and creeping in of roots.



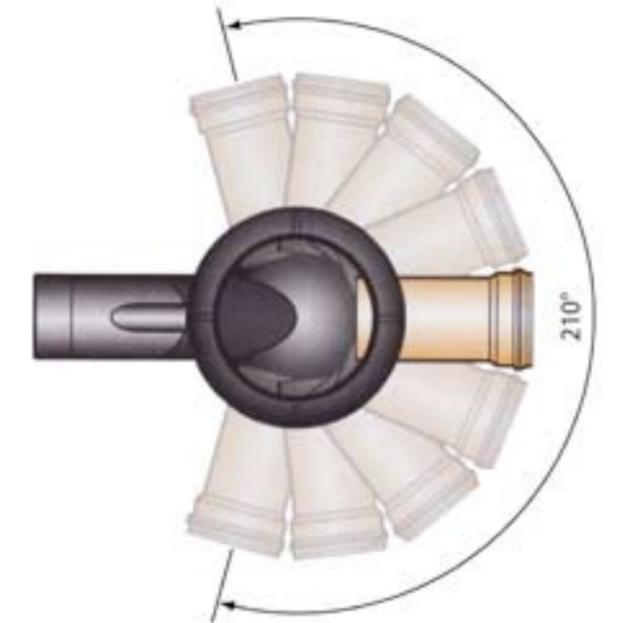
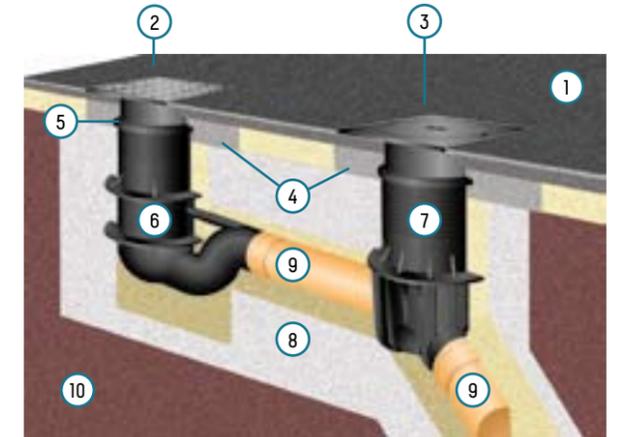
Whilst maintaining the typical strength of **HOFIT** products, the lightweight of the gullies and drains makes them easy and fast to handle, ensuring a rapid and safe installation. The **HOFIT** range includes road gullies and gully traps, allowing for maximum flexibility in the design of the system.

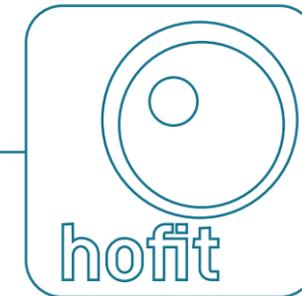
- 1) PAVEMENT
- 2) DRAIN
- 3) MANHOLE COVER
- 4) CONCRETE SLAB
- 5) GASKET
- 6) GULLY TRAP
- 7) INSPECTION CHAMBER
- 8) GRAVEL
- 9) PIPING
- 10) GROUND

The **HOFIT** road gullies satisfy the need for maximum installation flexibility, due to:

- Minimal overall size
- Fast installation and adaptation on site
- Connections are possible in 210°
- The possible use as trap or as a rainwater collection system with a drain

A complete series of dedicated accessories is also available, such as various types of covers and drains, depending on the particular design requirements.





Installation

The installation procedure is one of the strong points of the HOFIT HDPE manhole. The **faster installation time, reduced manpower requirements, light lifting gear and ease of connection to the sewerage system** are just some of the factors which contribute towards reducing the **installation costs by up to 50% compared to** an equivalent solution with concrete manholes.

What's priceless, is **the absolute safety for the operators** involved in the installation operations, thanks to the lightweight of the elements and the ease of handling.

In all the difficult situations which may be encountered – presence of groundwater, limited space, access difficulties - the solution proposed by HOFIT is often the only practical one.

Installation

The installation of the HOFIT manhole is easier, faster and safer compared to a concrete manhole. The final result is a significant saving on costs.

Preparation

- Add 15 cm to the depth of the manhole and 60 cm to its diameter
- Form a 15 cm thick bed from loose material (coarse sand or fine gravel) and compact to not less than 90% of the Proctor Standard
- Prepare the inlets and outlets on the base of the manhole and fit the specific gasket
- Place the base on the bed and check that it is level. Completely backfill the base with the same material and the same compacting procedure as the bed, proceeding by layers of 30 cm.
- If the manhole is supplied in elements, proceed with the construction of the manhole



Installation

COUPLING GASKETS: use the cup wheel cutter to cut the hole and fit the gasket.

CONNECTION WITH PIPES: clean the gasket; lubricate it and push the pipe inside the hole in the manhole as far as the stop point.

ELEVATIONS AND UPPER UNITS: after checking the perfect positioning of the gasket, clean and lubricate the housing surface and groove; the elements can then be assembled merely by pressing the body weight.

If necessary, cut the top neck of the element by following the marked lines.

The hole may be backfilled after construction, taking care to use suitable material, and compact in 30 cm layers to not less than 90% of the Proctor Standard.

Thanks to the particular elastic properties of the HOFIT gasket, any later connections to the manhole (private users, drains, etc.) may be carried out even after installation.

HEAVY LOADS: If the manhole is installed on a roadway or in areas subjected to heavy loads (group 3 or higher EN 124 - 1999), a concrete slab is necessary. The slab must be fitted in the ground compacted to a density of not less than 95% of the Proctor Standard.

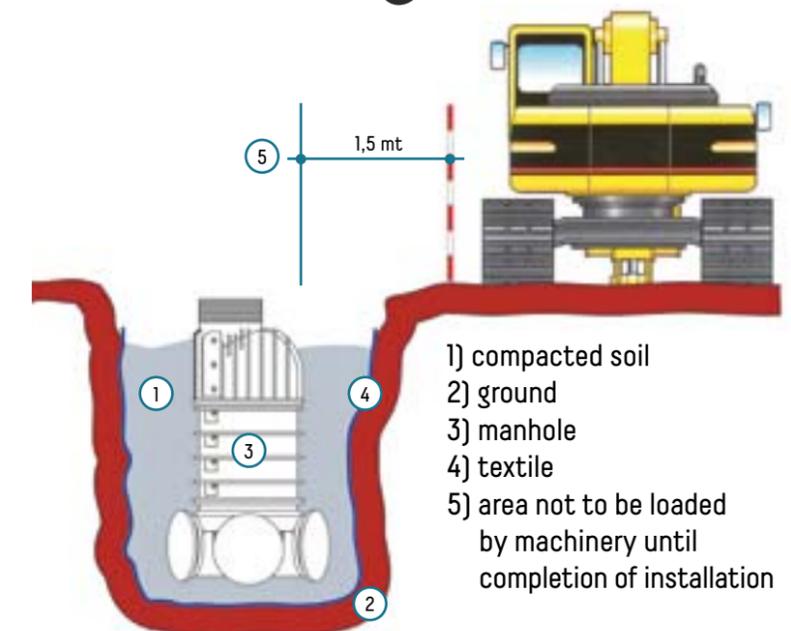
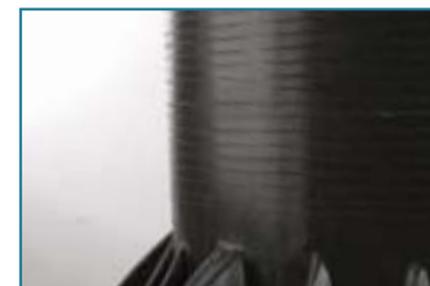
Installation in the presence of groundwater

In the presence of groundwater, any buried structure is buoyed up by a force equal to the volume of water displaced (Archimedes' Principle), thereby putting the stability of the structure at risk. It is vital that the design takes into account this phenomenon.

The anti-buoyancy rings designed by HOFIT are special but simple devices moulded directly in the structure of the HDPE manhole to guarantee the stability of the installation even in difficult conditions.

Calculations show how, under even the most critical conditions the manhole maintains its stability. HOFIT is able to verify the Customer's Project situation, taking into account:

- Deadweight of the manhole and its cover
- Weight of the soil placed directly on the terminal element of the manhole
- Weight of the soil placed on the anti-buoyancy rings
- Weight of the truncated cone portion which rests on the deepest anti-buoyancy ring
- Connection pipes, which are cut or withdrawn to raise the manhole
- Friction between the walls of the manhole and the particular surrounding soil



- 1) compacted soil
- 2) ground
- 3) manhole
- 4) textile
- 5) area not to be loaded by machinery until completion of installation

In 1978 we invented a new eco-friendly concept

HOFIT still believes in ecological technology
as the source for human future



WE BELIEVE IN ECO-LOGIC

