

# POLYPROPYLENE

## IG+





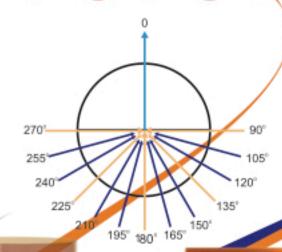
**Q** qualityaustria

SYSTEM CERTIFIED

ISO 9001:2008 No. AT-10310/0
ISO 14001:2004 No. AT-01397/0
BS OHSAS 18001:2007 No. AT-00569/0

NEW GENERATION MANHOLES

**FUTURA** 









Inter Construction is a dynamic and innovative company that was established to respond to market needs for infrastructural facilities (sewage) where together with the experience and organization of team led to rapid creation of a recognizable brand.

The company is equipped with rotomoulding technology, and to increase the competitiveness of the market, continuously improving the speed, quality and range of products, was realized the idea of introducing injection technology.

Durability, flexibility, resistance to chemicals and high quality products are obtained using non recyclable materials without adding any gas Ø≤ additives.

As evidence of the success of the work and the quality of the production process is ISO9001: 2008, ISO14001: 2004 and OHSAS 18001: 2007 - certificates of quality.

Inter Construction offers detailed technical - functional solutions that meet the various requirements of many industries.





### FOR TECHNOLOGY

Injection technology is high sofisticated technology.

It is the best method for high-performance of products with ideal surfaces.

The advantages of using this technology are:

- · flexibility
- · quick, efficient and effective production
- · economy
- · enables production of elements with different sizes and shapes
- · safe production

### MATERIALS

The new generation INTERHOL manholes - Future are made of polypropylene and polyethylene PE PP according standard EN 13598-1, EN 13598-2.

Environmental and high quality materials that can be easily recycled and thermally treated.

Table no1: Characteristics of polyethylene

Feature	Unit	Standard	Value
Melt flow index ( 230°C/2.16 kg)	g/10min	ISO 1133	4,5
Density	g/cm <sup>3</sup>	ISO 1183	0,957
Tensile modulus (1mm/min)	MPa	ISO 178	1700

### Table no.2 Characteristics of polypropylene

Feature	Unit	Standard	Value
Melf flow index ( 190°C/2.16 kg)	g/10min	ISO 1133	3,5-4
Density	g/cm <sup>3</sup>	ISO 1183	0,907
Tensile modulus (1mm/min)	MPa	ISO 178	1350



### CHARACTERISTIC OF FUTURA MANHOLES

Due to environmental pollution, global warming, the phenomenon of the greenhouse effect in large frames began to raise public environmental awareness through a variety of projects worldwide. The EU policy in the field of environment is based on high standards and encouraging innovation. That talks about this new era of manholes - Future manholes.

### Temperature resistance

Future manholes are constantly exposed on influence by different temperatures.

The form of the manhole remains unchanged under bright sunny effect during the summer, and also can not harm it low temperatures, or even hot waste water from industries.

Future manholes are stable at temperatures from -35 to +60 degrees Celsius.

100% waterproofness Future manholes are 100% leak-proof.

It compactness guarantees the waterproofness.

### Long life

Made of PE and PP completely exclude the possible problems and damages that may occur in other traditional manholes that have been used. All the characteristics that contain PE and PP as materials, have an important role in the strength and durability of the product.

In this case Future manholes are an excellent product with high quality features that ensure long life.

### Maintenance and security

The smooth inner surface of Future manholes prevents the collection of sediment — that provides a high coefficient of flow of wastewater. This important feature allows an extension of the lifespan of the manhole at the same time maintaining it. Security is provided through a specially designed non-slip stairs that are an integral element of the manhole. It can be made from several materials (PE, PP, aluminum, iron) depending on the claim.

#### Adjustable

Future manholes are adjustable in each domain: the height of the manhole, size socket connection to any kind of tube.

#### Chemical resistance

The characteristic resistance of PE and PP chemical aggression is well known.

The features of Future manholes are defined in the standard EN 13598-1/2, which confirms that the shafts of PE and PP are water resistant to a wide range of PH values, such as domestic and other waste water, rainwater, surface and underground water. The list of chemical resistance FUTURE manholes can be produced at the request of customers.

### Resistance of mechanical strokes

PE and PP are resilient and adaptable materials that do not break, so Future manholes are resistant to shocks and falls that may occur during installation.

### Fast delivery and development

Plastic injection technology is highly productive per unit time.

Depending on the needs of the buyer is able to perform certain changes of the product.

### Light weight and easy to manipulate

Low weight facilitates transport in two segments:

- Do not exceed the maximum permissible weight of transportation;
- Reduces the cost of transportation for use of all airspace in the transport vehicle.

Manipulative vehicle (forklift, crane or robot) can easily be lift, move and load Future elements.

Saving time and expense during installation.

Thanks to the low weight Future manholes are mounted easily and quickly without the need to use heavy machinery which saves time and costs for installation.



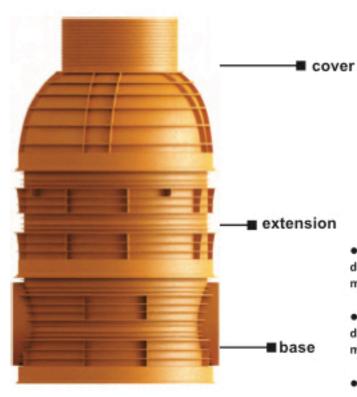
### USES

Due to the characteristics FUTURE manhole have versatile purpose :

SANITARY – SEWER SYSTEMS LANDFILLS CHEMICAL PLANTS SEWAGE SYSTEMS

The manholes are usually positioned:

AT THE BEGINNING OF THE CHANNEL
WHERE THE CHANNEL CHANGES THE DIMENSIONS
WHERE THE CHANNEL CHANGES THE DIRECTION
WHERE IT CHANGES THE LONGITUDINAL FALL OF THE CHANNEL



### STANDARDS

- EN 13598 -1 Plastic pressurless pipe system, underground drainage and sewer. PVC-U, PP and PE.Specifications for manholes of accessories including shallow inspection
- EN 13598 2 1 Plastic pressurless pipe system, underground drainage and sewer. PVC-U, PP and PE. Specifications for manholes and inspection chambers in a traffic environment
- . EN 476 Common requests for components used in
- . EN 14982 Determination of the class of stiffness.
- EN 14802 Determinations of the resistance in case of
- etraffic or other external burdens.
- DIN 4124 Excavation, trenches, width of working space,
- EN 1610 Construction and testing of drainage and sewer



### CONNECTION OF ADDITIONAL CONNECTORS WITH THE FUTURE MANHOLE

Depending from the clients requests the manhole is delivered on field fully welded or in elements that are assembled with rubber.

First way to obtain a compact manhole is to produce it as a monolithic, the wanted height in one compact part.

The second way is with welding of the elements with extruder during which is used a PE/PP wire. The heating of the PE/PP surface of the elements of the manhole and the melted PE/PP wire from the extruder are joined and they form a manhole that is 100% waterproof.

The third way to obtain consistency is to assemble specially designed rubber between the joining of every element. This rubber gives full stability to the elements and waterproofness





### 2. Socket

Future manholes are unic products where the Future Base is produced directly with socket, but depending of the customer needs on the base can be directly welded PE/PP socket according the needed dimensions.

This sockets allows easy and quick connection of the manhole with the sewage line.

#### 3. Rubber

There is a specially designed waterproof rubber with different dimensions. Aperture of the base is made with special knife for each dimension, for correctly placement to the aperture, that is 100% waterproof. The rubber is situated on the already made aperture of the basis, and before you put it pipe in it, the rubber must be covered with grease **Lubricant Neutrex** or similar.





### PAST AGAINST THE FUTURE ADVANTAGES OF FUTURE MANHOLES

### WATER TIGHTNESS & SHOCK RESISTANCE

Concrete manholes are produced from water permeable concrete. That talks that with difficulty it can be guarantee the tightness and resistance of the systems to the waste waters composed of agents.

#### vice versa

FUTURA manholes thanks to the material and specially designed rubber offers 100 % guarantee of impermeability, resistance to acid, chemical agents and different kind of aggressive materials. (according EN 1277, EN 12061)

### DAMAGED STEPS

Concrete manholes have steps that corrode due to the wet environment therefore represent a huge security risk to the worker.

#### vice versa

FUTURA manholes for that purpose have more anti-corrosive type scales (PE, PP, fiberglass, stainless steel, aluminum, etc.), which are integrated part of the manhole without using welding technology or adhesive.

### BAD LINK CONNECTIONS

The old water and sewage networks in the past were made with concrete or metal pipes.

### vice versa

FUTURA manholes can offer a mixture of every kind of pipe, size and material with integrated fabric manufactured waterflow - angle channel.

### CHARACTERISTICS OF THE MATERIAL

Concrete manholes are mixture of sand and cement which is elastic and flexible. Due to mechanical stress, earth and water pressures arising as a result of natural disasters, concrete gutters leak and fire.

#### vice versa

FUTURA manholes thanks to the superiod blend of strength, flexibility and elasticity of materials used for manufacturing do not have cracs and are durable in various environments. Futura manholes have reinforced external structure and are produced using high injection technology in different diameters in line with EN-13598-1; EN 13598-2; EN -14802, EN 476, ISO 9969, standards.

### · DAMAGED COVER

The lack of a suitable framework or concrete ring causes damage to the manhole cover.

The solution of FUTURA manholes is using concrete ring where heavy loads is guided straight to the ground.

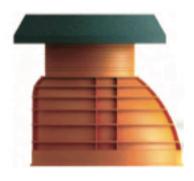
### UNDERGROUND WATER

The solution of FUTURA manholes: reinforced waterflow bottom and additional flat double bottom if it is needed.





- 1) Polyethylene Полиетиленски мазни
- 2) Cast iron Лиено желего
- 3) Polypropylene Полипропиленски
- 4) Clay Глина
- 5) GRP (FIBERGLASS)
- 6) PVC IIBU
- 7) Corrugated pipes Ребраски цевки

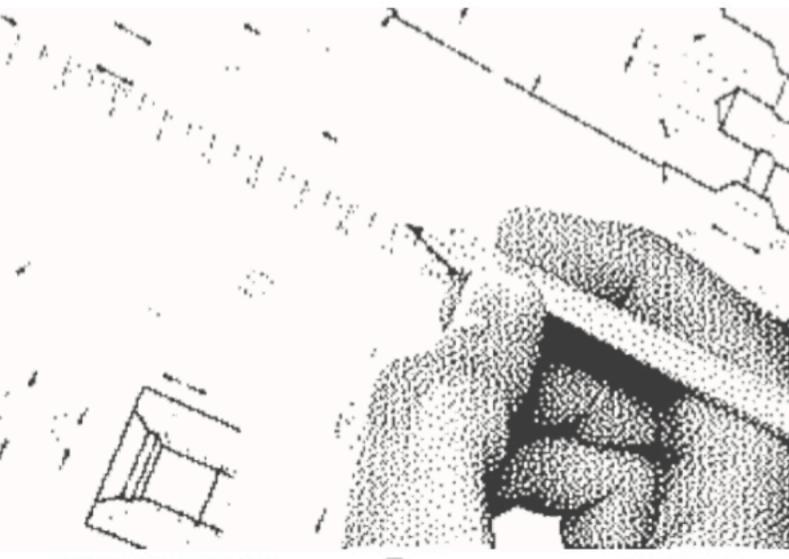






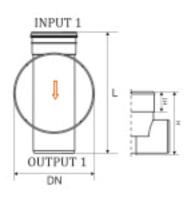
### TECHNICAL CHARACTERISTICS

# FUTURA - new generation manholes



### INTER



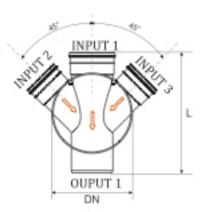


BS 400.200/160				
DN	400			
Н	415			
H1	155			
L	580			
INPUT 1/ OUTPUT 1	DN 200/160			

dimensions (mm)





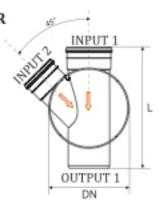


BS 400.200/160 2x45°					
400					
415					
155					
580					
DN 200/160					
DN 160					

dimensions (mm)







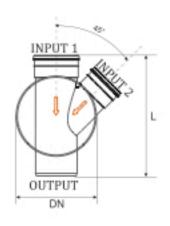
BS 400.200 1x45° R					
400					
415					
155					
580					
DN 200/160					
DN 160					

dimensions (mm)



BS OD 400 1x45° L





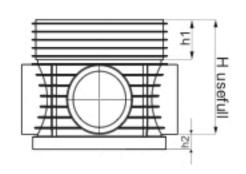
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H1	155				
L	580				
INPUT 1/ OUTPUT 1	DN 200/160				
INPUT 2	DN 160				

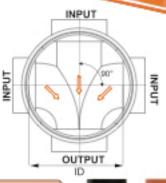




### BASE DN 600.300







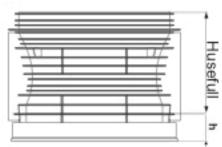
۱	INDEX	H usefull	h1	h2	ID	Input/Output
I	BS 600.300	400	170	55	600	OD/ID 110-300
ì	dimensions (mm)					5-

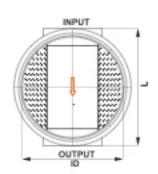




BASE DN 800.400 straight flow







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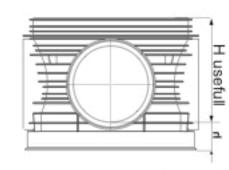


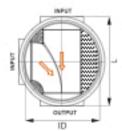


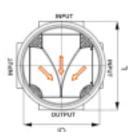
dimensions (mm)

BASE DN 800.400-T, 2T









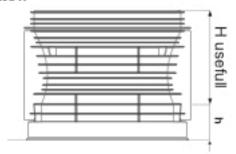
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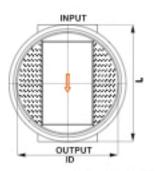




BASE DN 800.600 straight flow







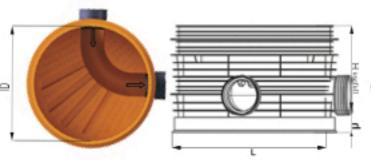
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1	BS 800.600	650	930	800	150	OD/ID 110 - 600





### INTER CONSTRUCTION

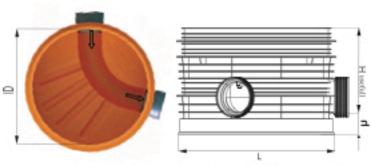
BASE 800 - 90°



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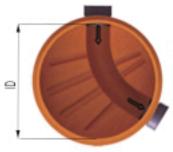
BASE 800 - 120°

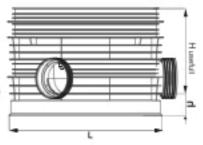
BASE 800 - 105°



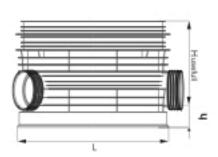
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BS 800	540	930	800	150	OD/ID 110 - 400
Harrison Louis Course					

BASE 800 - 135°





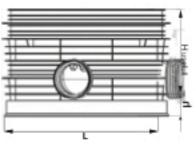
INDEX	H usefull	L	ID	h	Input/Otput
BS 800	540	930	800	150	OD/ID 110 - 400
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INDEX	H usefull	L	ID	h	Input/Otput
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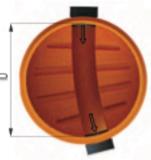
BASE 800 - 150°





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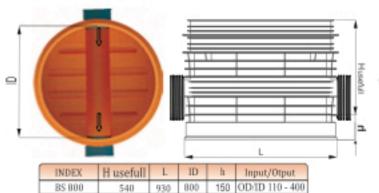
BASE 800 - 165°



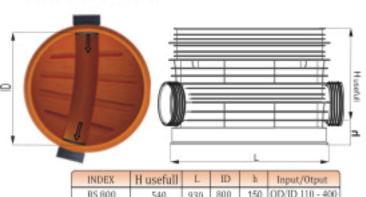


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disservations during					

BASE 800 - 180°





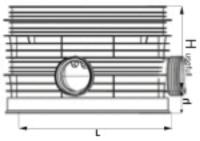




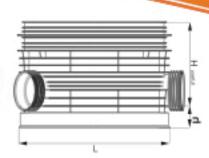


BASE 800 - 225°









800

930

Input/Otput

150 OD/ID 110 - 400

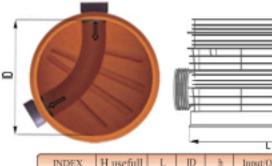
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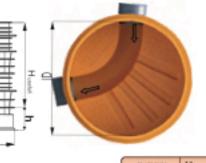
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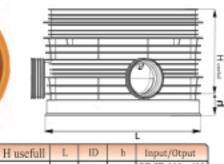
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H usefull

BASE 800 - 240°



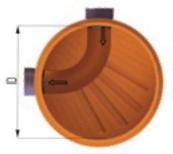


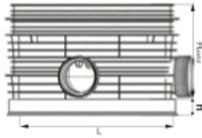


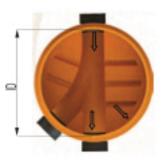
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dimensions (mm)					

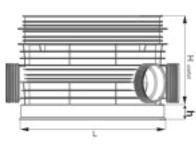
BASE 800 - 270°

BASE 800 - 1x45° R









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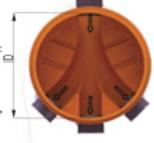
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BASE 800 - 1x45° L

BASE 800 - 2x45°





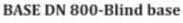


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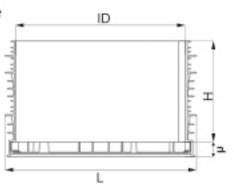
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BS 800	- 540	930	800	150	OD/ID 110 - 400

INDEX	H usefull	L	ID	h	Input/Otput
BS 800	540	930	800	150	OD/ID 110 - 400
iracasions (mm)	-				

### INTER CONSTRUCTION







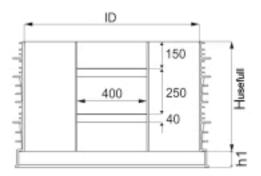
BS 8	BS 800-BLIND BASE						
DN	as it is needed						
Н	690						
h	90						
L	930						
ID	800						





EXTENSION 800





EXTENSION 800						
h1	Husefull	ID 800				
90	250					
90	500	800				
90	600	800				
90	1000	800				



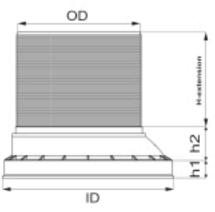
dimensions (mm)





COVER 800-TYPE 1





COVER ID800 - TYPE 1 h1 90 h2 180 H-extension 400

dimensions (mm)

ID

OD



800

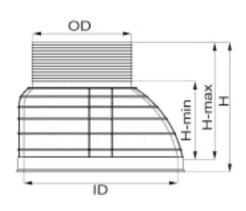
645



### COVER 800-TYPE 2

possibilities of reducing/increasing the height of the cover





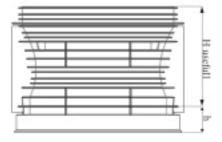
COVER ID	COVER ID800-TYPE2						
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H-min	420						
H-max	670						
OD	645						
ID	800						

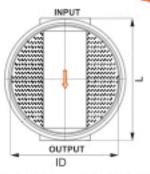




### BASE DN 1000.400 straight flow







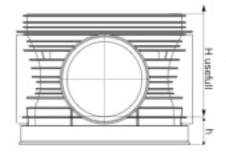
all L	117	11	Input/Output
1130	1000	150	OD/ID 110 - 400
		1130 1000	

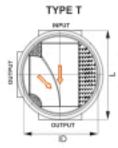


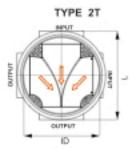


BASE DN 1000.400-T, 2T







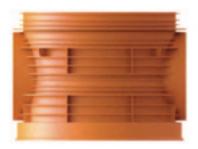


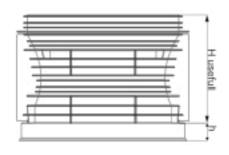
l L	11.	11	Input/Output
1130	1000	150	OD/ID 110 - 400
	1130	1130 1000	1130 1000 150

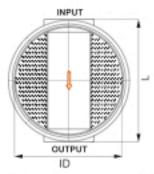




BASE DN 1000.600 straight flow







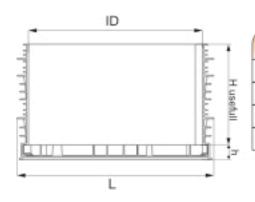
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BASE DN 1000-Blind base





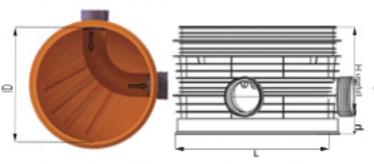
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DN	as it is needed					
H usefull	depends of needs					
L	1130					
ID	1000					





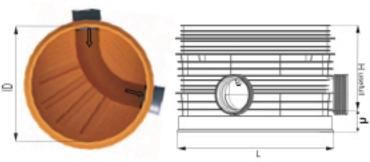
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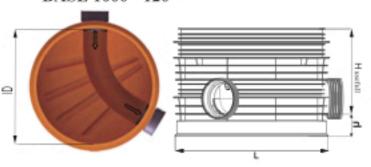
INDEX	H usefull	L	- ID	h	Input/Otput
BS 1000	540	1130	1000	150	OD/ID 110 - 400
dimensions (mm)	2.00				

BASE 1000 - 105°



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dimensions (mm)	1				

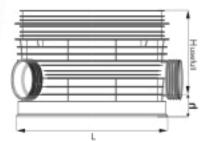
BASE 1000 - 120°



INDEX	H usefull	L	ID	h	Input/Otput
BS 1000	540	1130	1000	150	OD/ID 110 - 400
elitera maileren Comoni					

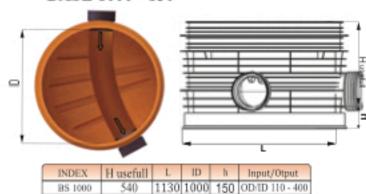
BASE 1000 - 135°





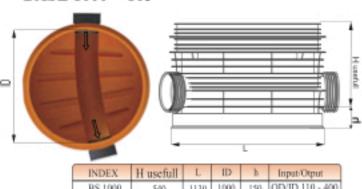
INDEX	H usefull	L	ID	h	Input/Otput
BS 1000	540	1130	1000	150	OD/ID 110 - 400
diamentary (see					

BASE 1000 - 150°



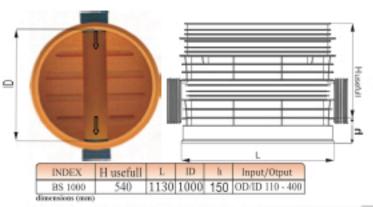


BASE 1000 - 165°

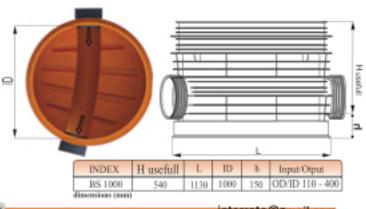


INDEX	H usefull	L	ID	h	Input/Otput
BS 1000	540	1130	1000	-150	OD/ID 110 - 400

BASE 1000 - 180°



### BASE 1000 - 195°

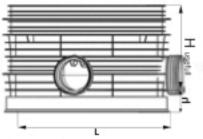




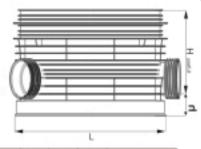










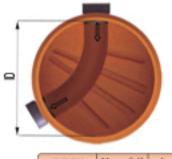


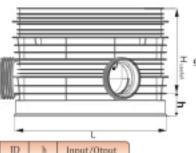
INDEX	H usefull	L	ID	h	Input/Otput
BS 1000	540	1130	1000	150	OD/ID 110 - 400
dimensions (mm)	i				

| INDEX | H usefull | L | ID | h | Input/Osput | BS 1000 | 540 | 1130 | 1000 | 150 | OD/ID 110 - 400 |

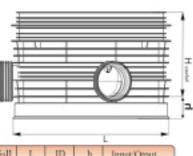
BASE 1000 - 240°

BASE 1000 - 255°







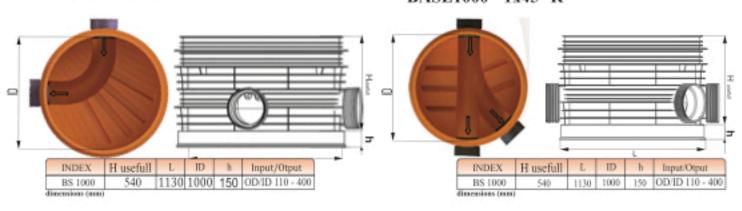


INDEX	H usefull	L	ID	h	Input/Otput
BS 1000	540	1130	1000	150	OD/ID 110 - 400
dimensions (mm)		1130	1000	130	ODAID ITO

| INDEX | H usefull | L | ID | h | Input/Otput | BS 1000 | 540 | 1130 | 1000 | 150 | OD/ID 110 - 400 |

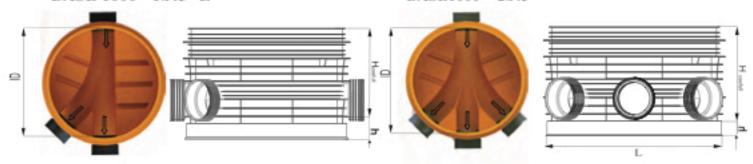
### BASE 1000 - 270°

BASE1000 - 1x45° R



### BASE 1000 - 1x45° L

BASE1000 - 2x45°



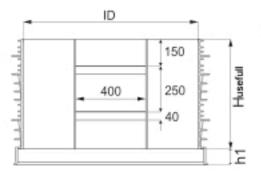
BS 1000 540 1130 100	00 150	OD/ID 110 - 400

	Input/Otput
150	OD/ID 110 - 400
	150



### **EXTENSION 1000**





EXTENSION 1000		
Husefull	ID	
250	1000	
500	1000	
600	1000	
1000	1000	
	Husefull 250 500 600	

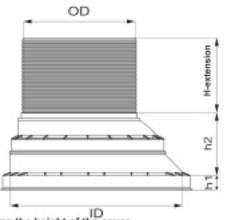
dimension (mm)











possibilities for reducing / increasing the height of the cover

COVER ID1000 -TYPE 1		
h1	90	
h2	420	
H-extension	400	
ID	1000	
OD	645	

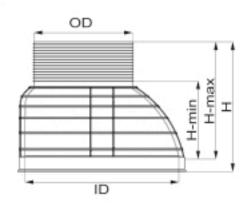
dimensions (mm)





### COVER 1000-TYPE 2





COVER ID1000-TYPE 2		
Н	870	
H-min	520	
H-max	770	
OD	645	
ID	1000	

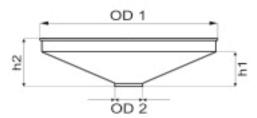
dimensions (mm)





### TANGENTEN CONUS OD 1000





TANGENT (	TANGENT CONUS OD 1000		
OD 1	1000		
OD 2	160		
h-1	220		
h - 2	270		

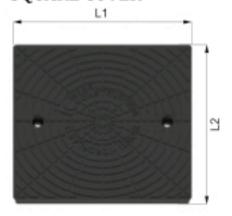


### ROUND COVER



index	diameter (mm)	
cover	Ø 400	Ø 600

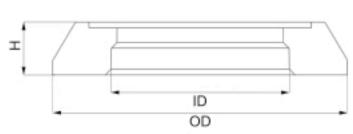
### SQUARE COVER

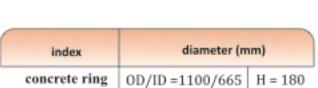


index	diameter (mm)	
square cover	L1 = 600	L2 = 600

### CONCRETE RING REINFORCED WITH FIBER GLASS

### SEAL FOR CONCRETE RING

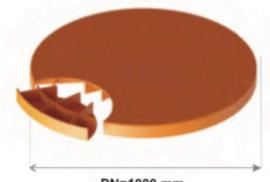




•	Ø	-
	10000	
1		

index	diameter (mm)		
seal	Ø = 645	H = 38	

### REINFOCED DOUBLE BOTTOM according customer needs



DN=1000 mm DN=800 mm

### SEAL FOR MANHOLE

OD/ID	Diameter of knife (mm)
OD 110	114
ID 110	125
OD 160	166
ID 160	193
OD 200	208
ID 200	240
OD 250	262
ID 250	295
OD 315	337
ID 300	355





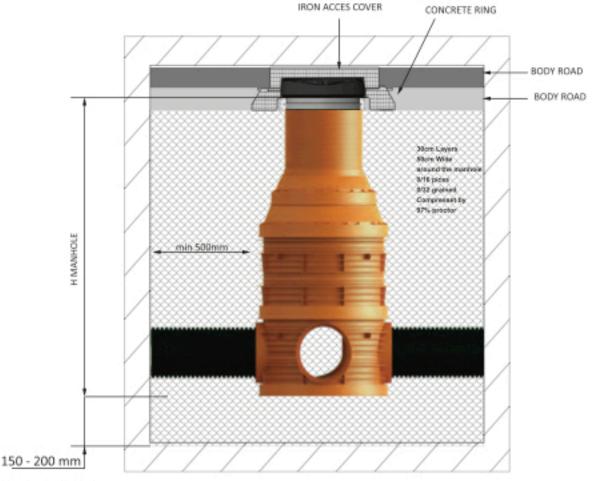


### INSTALATION OF THE FUTURE MANHOLE

### MANHOLE SETTINGS

PE and PP manholes must be set on sandy surface which should be a hard, and to used material that fits on lateral charging or fillings (compression). The dimensions of the separated material should be from 0 to 32 cm, and dimensions of the crushed material should be from 0 to 16 cm.

The surface should be made in layers of 15 to 20 cm and filled (compressed) to 97% by Procter. In case of presence of groundwater, the surface should be 30 cm made of concrete MB 15. Due to low weight the manual installation is possible, in case of machine handling tying the ropes and ribbons is allowed only around the button, bases manhole or to apertures intended for it.



### MANHOLE FILLINGS

You have to use same material as for the foundation. Fill the manhole correctly, grained material has to compressed by layers of 30 cm max, up to 97% of Procter, at least 50 cm wide from manhole. Filling around and under the manhole is important to prevent possible deformation and leaning.



### MANHOLE HEIGHT

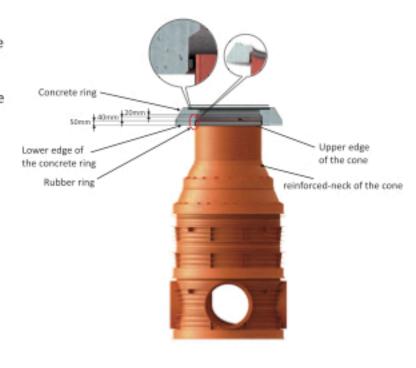
### SET UP OF CONCRETE RING

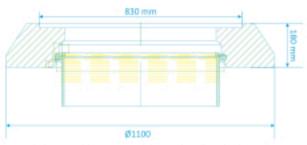
In case of heavy traffic, it is necessary to put a concrete ring on the cone. This concrete ring must not be in touch with the cone of the manhole. The empty space above the cone and the concrete ring should be 40mm, and between the cone and the ring a rubber is set up.

The cone should penetrate in the concrete ring 50mm.

In this way the static and dynamic burdening will not be transferred on the body of the manhole but on the pressed sand and the base around the manhole.

The concrete ring is not necessary in case of installation where there is no traffic and can be used a direct polyethylene / polypropylene cover or metal cover B 125.





### STORAGE AND TRANSPORT INSTRUCTIONS

- During storage and transport of manhole components storing over sharp and spiny objects is not allowed therefore avoiding point overloading.
- While unloading manholes from trucks to the forklifts should be used assisted by straps, without throwing it from height.
- 3. While moving, pulling over sharp edges or sharp objects be avoided.
- Storage height depends of the geometry of the components, but heights above 2.5 m are not recommended.
- The products can be stored outdoors because they have UV protection. If storage period is longer than 2 years, protection from direct sunlight is needed.
- Freezing is not an issue for components of Interhol manholes because PE and PP are stable until 35°C.
   Although elasticity of rubber sealing rings might be reduced, which might cause installation difficulties.
- Products should be kept out of contact with organic solvents and direct flame exposure.
- Module components are delivered together.
- Every components of the manhole has its ID number.



### INTERHOL TECHNICAL SOLUTIONS

### Technical solutions INTERHOL

Sometimes it is necessary to be designed specific solutions, and in that case we use INTERHOL elements in order to be satisfied the needs of the customers, while at the same time to meet the norms and standards.

Inter Construction pays special attention to design, and even more of the functionality of their products.

### Variants of special solutions of manholes:

- Sewage flow and right-angle flow manholes
- sewage-collecting tanks
- collection tanks
- manhole covers for installation systems
- underground tanks
- oil separators
- · treatment plants

### Manholes for reducing the speed flow INTERHOL-tg

At the steep terrains, many elements need to be placed at a short distance, and that means high fees for materials and excavation. Inter Construction offers solutions for reducing costs if manholes and other elements are adapted to the profile of the terrain. The technical solution that offers Inter Construction is tangentially manhole.



waste treatment tanks





oil separators

Using Interhol elements it can be performed manholes with sedimention item for cleaning sludge from the water.

Also items can be used for making tight storage tanks, that can be mounted exploatation measurement or other equipment.



### CERTIFICATES





















### WHEN IT COMES TO MANHOLES



Tel:

00389 34 231 300

00389 34 231 301

00389 72 272 603

00389 72 272 604

Fax:

00389 34 218 898

e-mail:interroto@gmail.com www.inter-construction.com.mk/en

Industrial Zone Prdejci - Gevgelija

MACEDONIA

