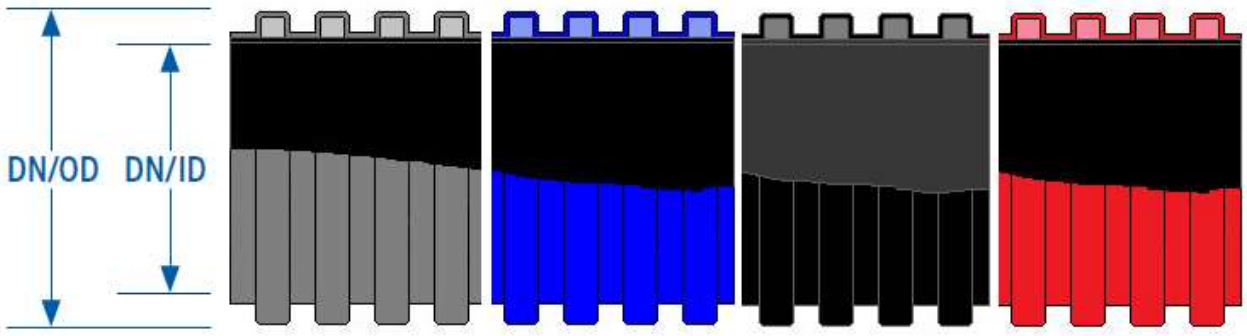
TECHNICAL DATA SHEET

CORRUGAR 450N

TRADE NAME	CORRUGAR CDP 450N
DESCRIPTION	Polyethylene High Density (HDPE) pipe double wall, corrugated external wall and smooth internal wall
FIELD OF USE	For cable passage in underground installations and/or external cemented building
NORMATIVE REFERENCES	- CEI EN 61386-1/A1 - CEI EN 61386-24 - Direttiva Bassa Tensione B.T.2014/35/UE (Annex I)
MARKS	- IMQ - CE
DIMENSIONAL RANGE	- From DN/OD 40 to DN/OD 200 - Compressive strength classification: 450N - L series (Light duty) / N series (Normal duty)
COLOURS	- External wall: **GREY** / **BLUE** / **RED** / **BLACK** - Internal wall: **BLACK**
LENGHT	25/50 m rolls / 6 m bar

EXTERNAL NOMINAL DIAMETER (mm) D_n	40	50	63	75	90	110	125	160	200
EXTERNAL DIAMETER REQUIRED BY REFERENCE STANDARD (mm) D_e	40,0÷ 40,8	50,0÷ 51,0	63,0÷ 64,2	75,0÷ 76,4	90,0÷ 91,7	110,0÷ 112,0	125,0÷ 127,3	160,0÷ 162,9	200,0÷ 203,6
MINIMUM INTERNAL DIAMETER REQUIRED BY REFERENCE STANDARD (mm) D_i	30	37	47	56	67	82	94	120	150
MINIMUM INTERNAL DIAMETER RICCINI PRODUCTIONS (mm) D_i	30,5	40,1	51,0	59,5	71,5	92,2	105,3	135,0	175,0
PACKAGING	ROLLS	ROLLS	ROLLS	ROLLS	ROLLS	ROLLS / BARS	ROLLS / BARS	ROLLS / BARS	ROLLS / BARS
COLOURS	EXTERNAL **GREY** (L and N series), **RED** (N series), **BLUE** (N series), **BLACK** (N series) / INTERNAL **BLACK**								



Images, drawings and colourings have a purely indicative purpose

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	CHARACTERISTICS	REQUIREMENTS	TEST PARAMETERS	TEST METHOD	TEST RESULT
PERFORMANCE CHARACTERISTICS	Compressive strength	≥ 450 N	- Test temperature: 23°C - Compression of 5% of the average internal diameter - Test speed: 15 mm/min	CEI EN 61386-24	> 450 N
	Impact strength L series	Max 3 breaks on 12 samples	- Test temperature: -5°C - Mass: 3kg - Falling height varies from 10 to 50 cm depending on the nominal size of the tube	CEI EN 61386-24	Breaks ≤ 3 on 12 samples
	Impact strength N series	Max 3 breaks on 12 samples	- Temperatura di prova -5°C - Mass: 5kg - Falling height varies from 30 to 80 cm depending on the nominal size of the tube	CEI EN 61386-24	Breaks ≤ 3 on 12 samples
	Bending test (optional)	No breakage of external/internal walls during bending	- Sample lenght: 1m - Temperature 23°C - Temperature -10°C	CEI EN 61386-24	Bending radius of at least 10 times the nominal diameter of the pipe

TECHNICAL SPECIFICATIONS
The CORRUGAR 450N pipe is supplied with quick jointing coupling sleeve and eventual interposition of gasket seal for watertight. Equipped with pull-roll in polyester wire
UV protection up to 18 months (for 100-110 kly/year average solar radiation)
High resistance to chemical agents (acids, alkaline, hydrocarbons and surfactants)
High legibility marking according to industry standards and with marker numerator

INSTRUCTIONS for INSTALLATION and LAYING

The conditions of installation and use of the pipes are established in accordance with the standard UNI EN 1610 that illustrates the laying conditions valid for any type of pipe not under pressure and of rigid or flexible type.
A correct laying procedure is also described in the UNI ENV 1046 standard and in Publication No. 3 of the Italian Institute of Plastics (IIP).
The realization of a correct laying, compliance with the requirements of the reference standards and the use of suitable products and proven quality guarantee safety and durability of the work.

TYPES of EXCAVATION
The excavation to be carried out is closely linked to the load assessment, the type of land and the organisation of the construction site.
In the execution phase, scrupulous correspondence between the project and the actual modalities of its implementation is therefore essential.
n the table we report the main types of excavation comparing the following parameters:
- D: Pipe diameter
- B: Width of the trench at the level of the upper tube generator
- H: Filling height on top of pipe generator

TYPE of TRENCH	B	
NARROW TRENCH	≤ 3 D	< H/2
WIDE TRENCH	> 3 D < 10 D	< H/2
ENDLESS TRENCH	≥ 10 D	≥ H/2

- NARROW TRENCH: It's the best place to put a pipe.
The tube is lightened by the overlying load, transmitting part of it to the surrounding soil as a function of the deformation by crushing to which the article itself is subjected.
- WIDE TRENCH: The load on the pipe is always greater than that on the narrow trench.
For this reason, in the design phase, it is advisable to start from this hypothesis to maintain a good margin of safety in the calculations of sizing.
- EMBANKMENT (positive position): The top of the pipe is above the natural level of the soil.
If the action of heavy loads is foreseen, this type of laying must not be adopted due to the subsidence of the soil induced by the absence of the excavation sides.
- EMBANKMENT (negative position): The pipe is placed at a level below the natural level of the ground.
As a result of the friction, even if modest, between the filling material placed on the embankment and the natural sides of the excavation, the pipe can withstand loads slightly higher than those of the positive position, but in any case inferior to those bearable in the arrangements to narrow and wide trench.

To be continued

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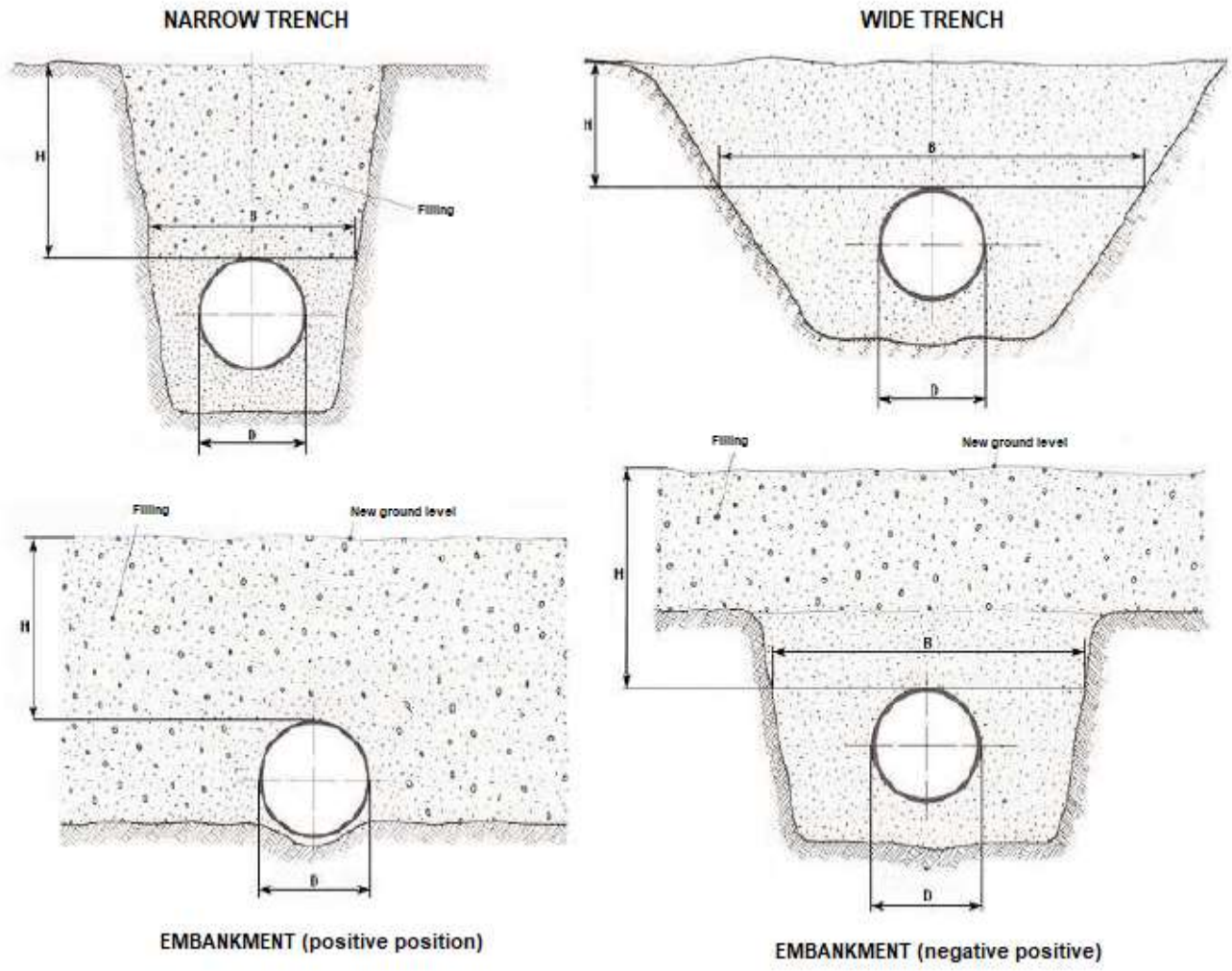


DEPTH of the TRENCH

The depth of the trench is determined by the slope to be imposed on the pipe and/or the protection that is intended to be provided to it.

The depth, in general, must meet the most cautionary of the following requirements:

$H \geq 1{,}0$ m and $H \geq 1{,}5\ D$

for pipes under road traffic or embankment and:

$H \geq 0{,}5$ m and $H \geq 1{,}5\ D$ in the other cases.

WIDTH of the TRENCH

The width of the trench is determined by the depth of installation and the diameter of the pipe and must be such as to allow the arrangement of the bottom, the connection of the pipes to each other and the accessibility to the staff.

The minimum width of bottom B (in m) is normally:

$B = D + 0{,}5$ (for $D \leq 0{,}4$ m) and $B = 2D$ (for $D \geq 0{,}4$ m)

It is advisable not to exceed these limit values since the efficiency of the trench is the greater the smaller its width.

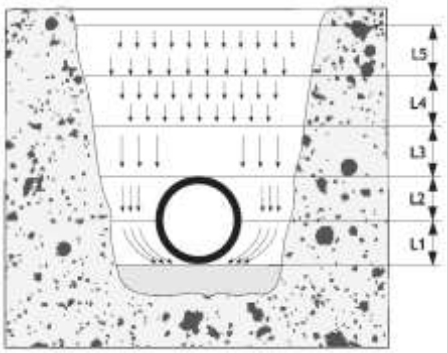
To be continued

GROOT BED

It must be verified that the laying bed is paved and levelled eliminating any roughness that may damage the pipes.
If it is necessary to build the laying bed by using materials other than excavation, it is necessary to ascertain the possible existence of materials capable of damaging the pipe during installation.
In no case is it allowed to adjust the position of the pipes in the trench using stones or bricks or other discontinuous supports.
The laying plan must guarantee absolute continuity of support and, in the areas where settling is feared, special measures must be taken such as the use of appropriate joints or special treatments of the bottom of the trench.
Pipes damaged during installation must be repaired or replaced according to the severity of the damage.
In case the bottom of the excavation is made of soft materials and free of stones or hard debris, the pipe can be installed directly on the bottom of the excavation provided that the level (section where there is no variation in the slope) is correct.
Typically this condition occurs rather rarely.
It is almost always necessary to make a bed of sand or gravel of small size of at least 10 cm high, so that the lower part of the pipe never rests directly on the ground of the excavation.
It is absolutely not recommended to use material that has sharp edges.
The UNI EN 1610 STANDARD provides that the maximum particle sizes of the materials used for the realization of the laying bed are:
22 mm for DN ≤ 200
40 mm for 200 < DN ≤ 630
For the lifting and laying of the pipes in trenches, in relief or on supports, maximum caution must be taken, avoiding damaging the surfaces of the pipes and using suitable means depending on the diameter to be handled.
During the laying operation, it must also be avoided that any debris or foreign matter of any nature that may damage the internal surface as well as the joints of the pipes enters the pipes.

BACKFILL PROCEDURE

The filling of the trench and in general of the excavation is a delicate and important operation in the installation of sewage pipes; a filling carried out without adequate compaction adversely affects the performance of the system.
1) The material already used for the construction of the groot bed should be placed around the tube and compacted by hand to form successive layers of 20-30 cm, up to the center of the tube, taking the utmost care to verify that no empty areas remain under the pipe and that the layer of bulk between the pipe and the wall of the excavation is continuous and compact (layer L1 in the figure).
2) The second layer of bulk (L2) reaches the top of the tube.
Its compaction must always be carried out with the utmost care
3) The third layer (L3) must reach a height of about 15 cm above the upper tube generator.
Compaction should be carried out only laterally to the pipe, never on its vertical.
The compaction of the filling material surrounding the tube must be uniform.
For installations of considerable lenght the compaction should be programmed in limited sectors and in hours not too hot, to avoid uneven compaction due to thermal expansion.
For the shoulder is strongly discouraged the use of peaty, muddy, clay or icy soils, which, given the high water content, are difficult to compact.
4) Additional fillings L4 and L5 shall be carried out with the material from the excavation, possibly purified of the elements with a diameter greater than 10 cm and of the plant and/or animal fragments; it shall be carried out in successive layers equal to 20-30 cm which must be compacted and, if necessary, wetted to the thickness of 1 m (measured by the upper tube generator).
Finally, a free space should be left for the last layer of vegetable soil.



To be continued

SPECIAL INSTALLATION CONDITIONS

CORRUGAR 450N pipe, like other types of HDPE structured pipes, has a certain buoyancy when immersed in water.
More over the filling, even with arid and dry material, tends to lift the pipe.
Special attention is therefore needed at this stage of work.
Laying in the presence of groundwater must be carried out in dry excavation bottom conditions.
To do this it is essential to use well-point systems to extract excess water.
Filling must prevent buoyancy or wall collapse.
Finally, the particle size of the backfill material must be such as to prevent a migration of particles to the adjacent soil and vice versa, migration that can be prevented by placing appropriate filter fabric (geotextile membrane type).
Where there are, for limited sections, more difficult laying conditions than those of the project (sagging of the walls, landslides, etc...), the construction of special protective walls in stone and/or concrete must be carried out, or other reinforcement solutions authorized by the Works Management.
If, for technical reasons, the covering height is at some point lower than the prescribed minimum, it is appropriate to affix products such as rigid diaphragms of protection and load distribution, to be placed above the last layer of compact minute material.
If the sewerage system is located under roads with frequent heavy traffic or under railway tracks, a protective steel sheath pipe may be provided or the pipe may be laid in a reinforced concrete tunnel.

CORRUGAR CDP 450N pipes are produced by Riccini S.r.l., a company operating with Quality System compliant with ISO 9001:2015 and ISO 14001:2015 certified by accredited third parties (CSQ-IQNet)

San Martino in Campo (Perugia-Italy) – March 01, 2023