

Plastic conduit systems
for buried underground networks



**FOR THE PROTECTION & MANAGEMENT
OF ENERGY & TELECOMMUNICATION
BURIED NETWORKS**



A MORE SUSTAINABLE
ENVIRONMENT IS OUR
MAIN PRIORITY...

Marina Ayia Napa (under construction)

One of the most important investments in the Mediterranean
area that trusted GEONFLEX N750 & GEOSUB L450 conduits.



we design innovative
conduit systems that improve
our quality of life



MAXIMUM PROTECTION OF POWER SUPPLY & TELECOMMUNICATION NETWORKS

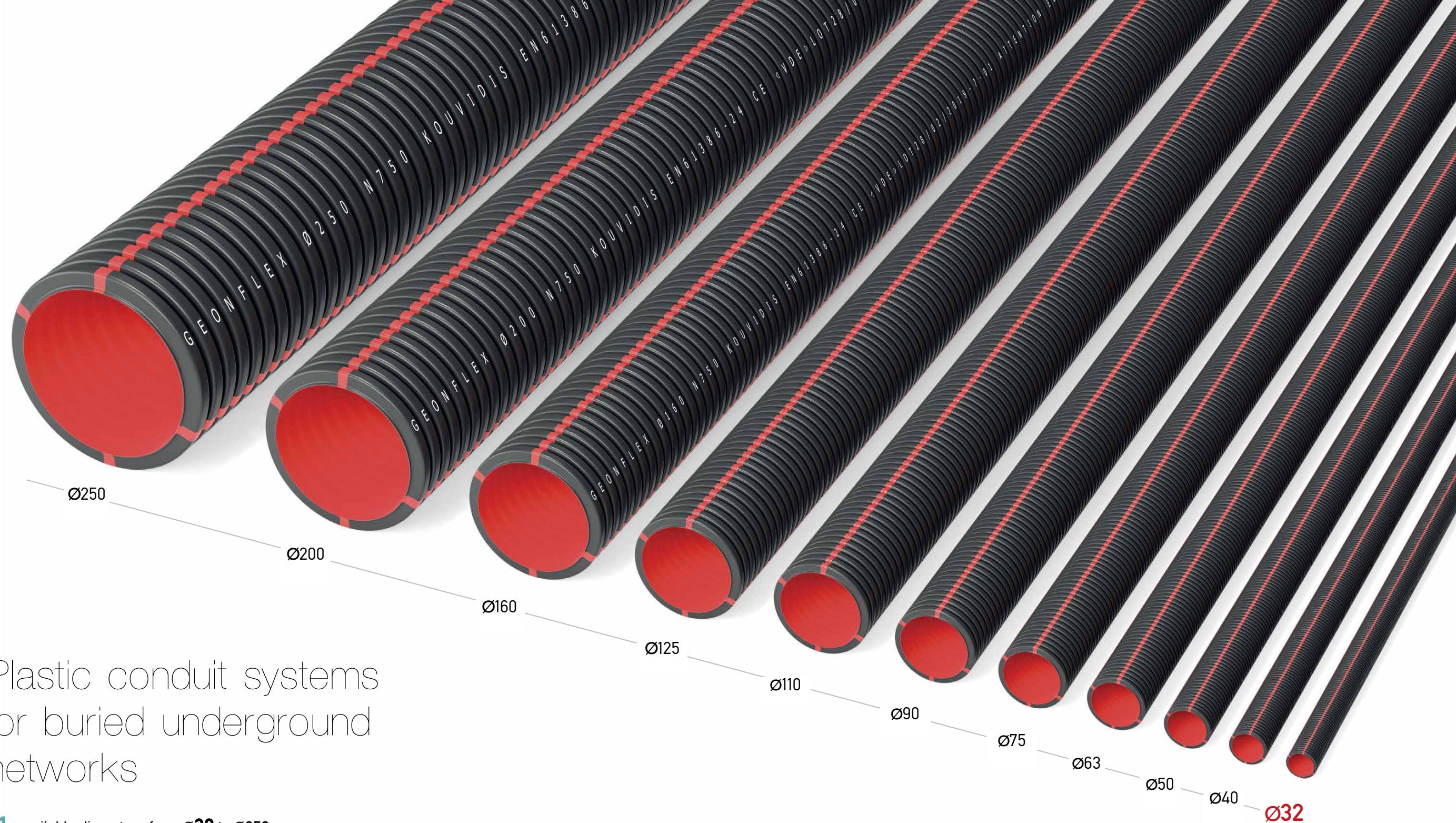
double structured wall conduits

N GEONFLEX® N750 **L** GEOSUB® L450

at a glance...

GEONFLEX® N750 & GEOSUB® L450 double wall conduits are two of the most precious products in KOUVIDIS history because their arrival was a breakthrough that changed the protection of cables in buried underground installations.

- 2011** KOUVIDIS designed the first generation of GEONFLEX® N750 conduits.
- 2012** GEONFLEX® N750 gained electricians and engineers respect and KOUVIDIS became the first company in Greece investing in double structured wall conduits.
- 2014** KOUVIDIS expanded its product family with GEOSUB® L450 conduits, and with over 1 million meters of production, they were placed in hundreds of major construction projects, such as Stavros Niarchos Foundation Cultural Center.
- 2016** KOUVIDIS acquired the second production line for double structured wall conduits.
- 2017** KOUVIDIS launched the 2nd generation of GEONFLEX® N750 & GEOSUB® L450 conduits with color marking upgrading both product itself and Electrician's work.
- 2019** KOUVIDIS acquired the third production line for double wall conduits, and expanded its product range with **spacers** and a **new diameter of Ø 32** for GEONFLEX® & GEOSUB® conduits.
- 2022** Since 2012, GEONFLEX® and GEOSUB® fulfill a 10-year presence of phenomenal success with increasing usage both in Greece and abroad. Additionally, the conduits were recognized with the golden award at the Made in Greece awards in the "Branded Industrial Product" category.



Plastic conduit systems for buried underground networks

11 available diameters from Ø**32** to Ø250

2 product families, GEONFLEX® N750 & GEOSUB® L450

10 years of know-how in production of double wall conduits

New diameter!

GEONFLEX® & GEOSUB® double wall conduits

Following the method of co-extrusion a third independent layer of longitudinal lines, of indelible color, is incorporated, during the production process, on the outer conduit's corrugated wall creating a long lasting color marking between electrical installations and communication systems.

RAL 3020

Red color coding protection
of cables in **electrical**
installations

RAL 6037

Green color coding protection
of cables in **communication**
systems

In this way, our new second-generation conduits, protect the personnel performing technical installation or maintenance tasks by warning them about the riskiness of the buried underground pipelines. At the same time, they facilitate engineer's work providing a better and safer way of networking.

Finally, our new second-generation conduits achieve increased resistance to solar radiation (UV), longer than 5 years, which is necessary in order to ensure their mechanical properties after a long period of storage in the warehouse or in the construction site.

The color identification of GEONFLEX® & GEOSUB® conduits follows the rules set by the Standard NF P 98-332 which specifies the pipeline coloring according to the application field and the minimum distances buried pipes should have between each other. The new warning marking, of our conduits, follows the specifications of products intended to protect and warn of buried underground installations according to the European Standards EN 12613 & EN 50520.

GEONFLEX® and GEOSUB® conduits can be produced with different color coding upon request.

main properties of GEONFLEX® & GEOSUB® conduits



GEONFLEX®

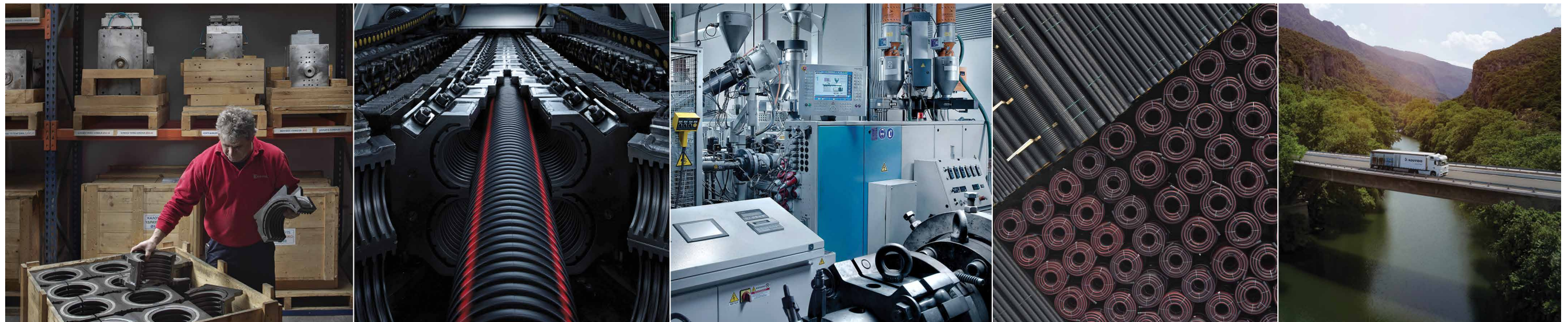
GEOSUB®

Type	N750	L450
Resistance to compression	≥750Nt (Type 750)	≥450Nt (Type 450)
Resistance to impact	Normal	Light
IP ingress protection	IP44/IP68*	IP40/IP68*
Virgin raw materials	•	—
Halogen free raw materials	•	•
Flame propagating	•	•
Warning marking	•	•
Ageing resistance > 5 years	•	•
VDE marks approval	•	•
Rodent Repellent (internal layer)	•	—
Low friction (Special material (slip) speeds up the routing of cables)	•	—
Antistatic technology	•	•
Suitable for Concrete formwork	•	—
Label color (coils)	Green	Red
Safety strap color (coils)	White	Black
Packaging	Coils 25m: Ø40 to Ø200 Coils 50m: Ø32 to Ø125 Bars 6m: Ø75 to Ø250	Coils 25m: Ø160 and Ø200 Coils 50m: Ø32 to Ø125 Bars 6m: Ø75 to Ø250
Color	Outer wall: Black RAL 9004 Inner wall: Red RAL 3020	Outer wall: Black RAL 9004 Inner wall: Red RAL 3020

VDE marks approval certificates for GEONFLEX® - GEOSUB® conduit systems are available in our website www.kouvidis.com

* Coupler bonded with KOUVIDIS sealant and adhesive.





the design



Need

The underground routing of the public utility networks for safety reasons (avoid exposure to extreme natural phenomena and transmission of electromagnetic radiation) and the upgrading of the urban environment (better aesthetics since they are not an eyesore).



Research

The design of a robust, easy to use and environmentally friendly product that will protect the cables from external factors and will facilitate the installation and accessibility to the network combining the properties of a pliable and a rigid pipe at the same time.



Manufacturing technology

Welding of three different walls during the production process through co-extrusion. The corrugated external wall of the conduit provides the necessary flexibility and the required mechanical strength with the use of less raw materials. The internal smooth wall ensures the smooth insertion of the cables during the installation/replacement.



Generation

Acquisition of two fully automated production lines, from top European companies, that produce double structured wall HDPE conduits, in nominal outer diameters from Ø32 to Ø250, with the brand name GEONFLEX® and GEOSUB® with mechanical resistance N750 (the maximum resistance according to EN 61386-24) and L450 respectively.



Application field

Protection and management of buried underground power and telecommunication networks (motorways, road networks, tunnels etc.), urban development projects (pedestrianization, shaping of public spaces, rehabilitation of historic centers, etc.), RES urban development projects (photovoltaic and wind parks), construction projects such as industrial buildings, shopping centers, housing, etc.



Distribution Network

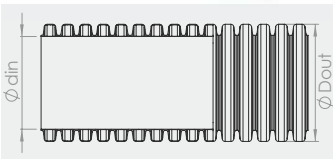
A distribution network with authorized wholesalers of electrical materials, with more than 500 sales points all over the Greek and Cypriot territory, served on a daily basis by our 50 privately owned low emission fleet.



Environmental footprint

Made from 100% eco-friendly materials that comply with the requirements of the European RoHS and REACH regulations, regarding the use of chemicals and hazardous substances, respectively, and can be recycled at the end of their product life cycle, without burdening the environment.

Normal Type (N750)



Standards: EN 61386-24

Reference Standards: NF P 98-332, EN 12613 & EN 50520

More features of GEONFLEX® bars and coils

Assembled with
Connection coupler with hooks
End caps

Red color coding protection of cables in **electrical installations**

Green color coding protection of cables in **communication systems**

Patent protected: 1009810, EP2698792, 1009158, 1008090
Hellenic Industrial Property Organization

GEONFLEX® bars are also available with **green** color marking (acc. to NF P 98-332) with part numbers 1011XXX (where XXX is the diameter of the conduit).



All product's certificates are available at www.kouvidis.com

N GEONFLEX® IAS (in bars)

Properties

Resistance to compression	750Nt (type 750)
Resistance to impact	Normal
Lower temperature range	-5°C
Upper temperature range	+90°C
Resistance to bending	Rigid
Electrical characteristics	With electrical insulated characteristics
IP ingress protection	IP44 (coupler connected) IP 68 (coupler bonded with KOUVIDIS sealant)
Resistance to flame propagating	Flame propagating

Additional properties

Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Ageing resistance	UV stabilized (≥ 5 years)
Low friction (internal layer)	Special material (slip) speeds up the routing of cables
Rodent Repellent	Not attractive to rodents (the internal layer incorporates rodent repellent)
Color marking	Longitudinal stripes of indelible color indicate the power of the protected cables
Antistatic Technology	Protection against static electricity

+ Double structured wall conduits, corrugated outside and smooth inside, printed with indelible color with their basic properties and affixed with an informative waterproof indelible green label. Ideal for buried underground power and telecommunication networks, urban development projects, RES urban development projects and construction projects.

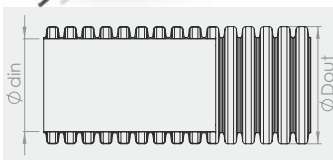
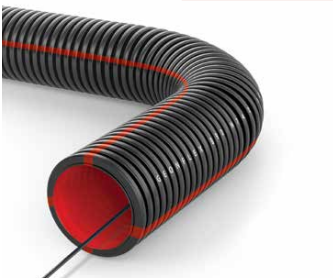
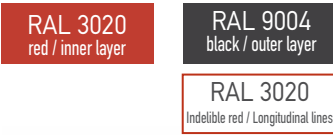
Their special design ensures higher mechanical resistance, over 750Nt in compression.

Type	Part number					
Ø75	1007075	75	60.0	6	2,90	10080
Ø90	1007090	90	74.0	6	3,60	6912
Ø110	1007110	110	92.0	6	5,00	4800
Ø125	1007125	125	104.5	6	5,30	3072
Ø160	1007160	160	136.0	6	8,30	2520
Ø200	1007200	200	167.5	6	9,70	1800
Ø250	1007250	250	212.0	6	16,70	960

NOTE: Product with minimum order quantity requirement

NOTE: GEONFLEX® bars come with a connection coupler with hooks at one end.

Normal Type (N750)



Standards: EN 61386-24

Reference Standards: NF P 98-332, EN 12613 & EN 50520

GEONFLEX® coils are also available with **green** color marking (according to NF P 98-332) with part numbers 2018XXX (25m) 2019XXX (50m) (where XXX is the diameter of the conduit)

NOTE: GEONFLEX® conduits come with cable guide and protective caps at each conduit's end.

In 50m coil packaging an internal safety strap is placed on the 25th meter to keep the initial shape of the coil unchanged when its external straps are snipped off.



N GEONFLEX® IAS (in coils)

Properties

Resistance to compression	750Nt (type 750)
Resistance to impact	Normal
Lower temperature range	-5°C
Upper temperature range	+90°C
Resistance to bending	Pliable
Electrical characteristics	With electrical insulated characteristics
IP ingress protection	IP44 (coupler connected) IP 68 (coupler bonded with KOUVIDIS sealant)
Resistance to flame propagating	Flame propagating

Additional properties

Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Ageing resistance	UV stabilized (≥ 5 years)
Low friction (internal layer)	Special material (slip) speeds up the routing of cables
Rodent Repellent	Not attractive to rodents (the internal layer incorporates animal repellent)
Internal guide	Cable guide with minimum tensile strength 650Nt
Color marking	Longitudinal stripes of indelible color indicate the power of the protected cables
Antistatic Technology	Protection against static electricity

+ Double structured wall conduits, corrugated outside and smooth inside, printed with indelible color with their basic properties, packed with **WHITE** safety straps and affixed with an informative waterproof indelible green label. Ideal for buried underground power and telecommunication networks, urban development projects, RES urban development projects and construction projects.

Type	Part number 25m / 50m					
Ø32	2007032 /2008032	32	24.0	25m/50m	2,58/5,15	33750/40000
Ø40	2007040/2008040	40	30.0	25m/50m	3,80/7,72	26250/31500
Ø50	2007050/2008050	50	37.0	25m/50m	4,40/9,80	16250/21000
Ø63	2007063/2008063	63	47.0	25m/50m	6,40/14,29	11500/14000
Ø75	2007075/2008075	75	60.8	25m/50m	9,13/18,20	6250/7750
Ø90	2007090/2008090	90	74.9	25m/50m	14,43/28,92	3750/5500
Ø110	2007110/2008110	110	92.5	25m/50m	16,98/34,01	3000/4000
Ø125	2007125/2008125	125	105.3	25m/50m	21,13/42,41	3125/3500
Ø160	2007160/-	160	137.1	25m	32,84	1900/-
Ø200	2007200/-	200	169.1	25m	39,13	1225/-



Standards: EN 61386-24
Reference Standards: NF P 98-332,
EN 12613 & EN 50520
More features of GEOSUB® bars and coils

Assembled with
Connection coupler with hooks
End caps

Red color coding protection of cables
in **electrical installations**

Green color coding protection of cables
in **communication systems**

**Patent protected: 1009810,
EP2698792, 1009158, 1008090**
Hellenic Industrial Property
Organization

GEOSUB® bars are also available with **green**
color marking (acc. to NF P 98-332) with part
numbers 1009XXX (where XXX is the diameter
of the conduit)



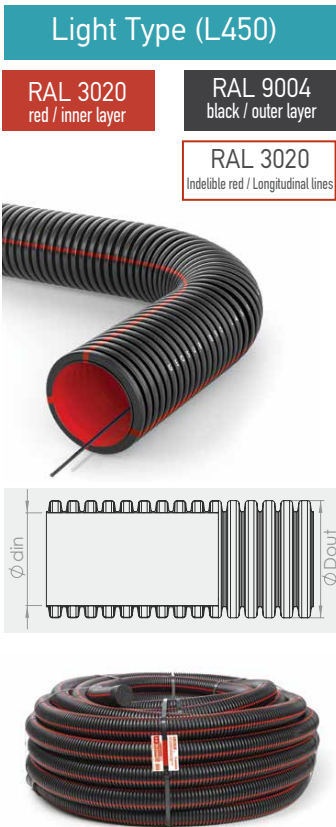
L GEOSUB® IAS (in bars)

Properties	
Resistance to compression	450Nt (type 450)
Resistance to impact	Light
Lower temperature range	-5°C
Upper temperature range	+90°C
Resistance to bending	Rigid
Electrical characteristics	With electrical insulated characteristics
IP ingress protection	IP40 (coupler connected) IP 68 (coupler bonded with KOUVIDIS sealant)
Resistance to flame propagating	Flame propagating
Additional properties	
Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Ageing resistance	UV stabilized (≥ 5 years)
Color marking	Longitudinal stripes of indelible color indicate the power of the protected cables
Antistatic Technology	Protection against static electricity

+ Double structured wall conduits, corrugated outside and smooth inside, printed with their basic properties and affixed with an informative waterproof indelible mauve label.
Ideal for buried underground power and telecommunication networks, urban development projects, urban development and construction projects.

Type	Part number					
Ø75	1006075	75	61.0	6	1,95	10080
Ø90	1006090	90	75.8	6	2,75	6912
Ø110	1006110	110	92.0	6	3,57	4800
Ø125	1006125	125	105.5	6	4,45	3072
Ø160	1006160	160	137.5	6	6,30	2520
Ø200	1006200	200	169.3	6	7,65	1800
Ø250	1006250	250	212.0	6	10,80	960

NOTE: Product with minimum order quantity requirement



Standards: EN 61386-24
Reference Standards: NF P 98-332,
EN 12613 & EN 50520

NOTE: GEOSUB conduits come with a cable guide and protective caps at each conduit's end.
In 50m coil packaging an internal safety strap is placed on the 25th meter to keep the initial shape of the coil unchanged when its external straps are snapped off.

GEOSUB® coils are also available with **green** color marking (acc. to NF P 98-332) with part numbers 2020XXX (where XXX is the diameter of the conduit).



L GEOSUB® IAS (in coils)

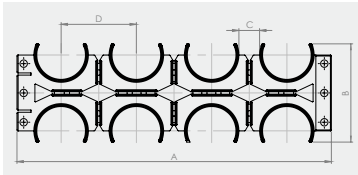
Properties	
Resistance to compression	450Nt (type 450)
Resistance to impact	Light
Lower temperature range	-5°C
Upper temperature range	+90°C
Resistance to bending	Pliable
Electrical characteristics	With electrical insulated characteristics
IP ingress protection	IP40 (coupler connected) IP 68 (coupler bonded with KOUVIDIS sealant)
Resistance to flame propagating	Flame propagating
Additional properties	
Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Ageing resistance	UV stabilized (≥ 5years)
Internal guide	Cable guide with minimum tensile strength 650Nt
Color marking	Longitudinal stripes of indelible color indicate the power of the protected cables
Antistatic Technology	Protection against static electricity

+ Double structured wall conduits, corrugated outside and smooth inside, printed with their basic properties, packed with special **BLACK** safety straps and affixed with an informative waterproof indelible mauve label.
Ideal for buried underground power and telecommunication networks, urban development projects, urban development and construction projects.

Type	Part number					
Ø32	2006032	32	24.0	50	4,20	40000
Ø40	2006040	40	30.0	50	5,86	31500
Ø50	2006050	50	37.0	50	6,99	21000
Ø63	2006063	63	47.0	50	10,59	14000
Ø75	2006075	75	61.5	50	14,21	10000
Ø90	2006090	90	76.3	50	20,05	7000
Ø110	2006110	110	92.7	50	26,09	4500
Ø125	2006125	125	106.1	50	30,57	3500
Ø160	2006160	160	138.4	25	25,19	1900
Ø200	2006200	200	171.1	25	32,43	1225

Fittings

RAL 9004
black



Spacer

Properties

Raw material	Specially stabilized thermoplastic PP, halogen free and heavy metals free (RoHS)
Electrical characteristics	With electrical insulated characteristics
Resistance to flame propagating	Flame propagating
Temperature resistance range	-5°C to +90°C
Compatibility (conduit nominal outer diameter)	Ø50 Ø63 Ø75 Ø90 Ø110 Ø125 Ø160

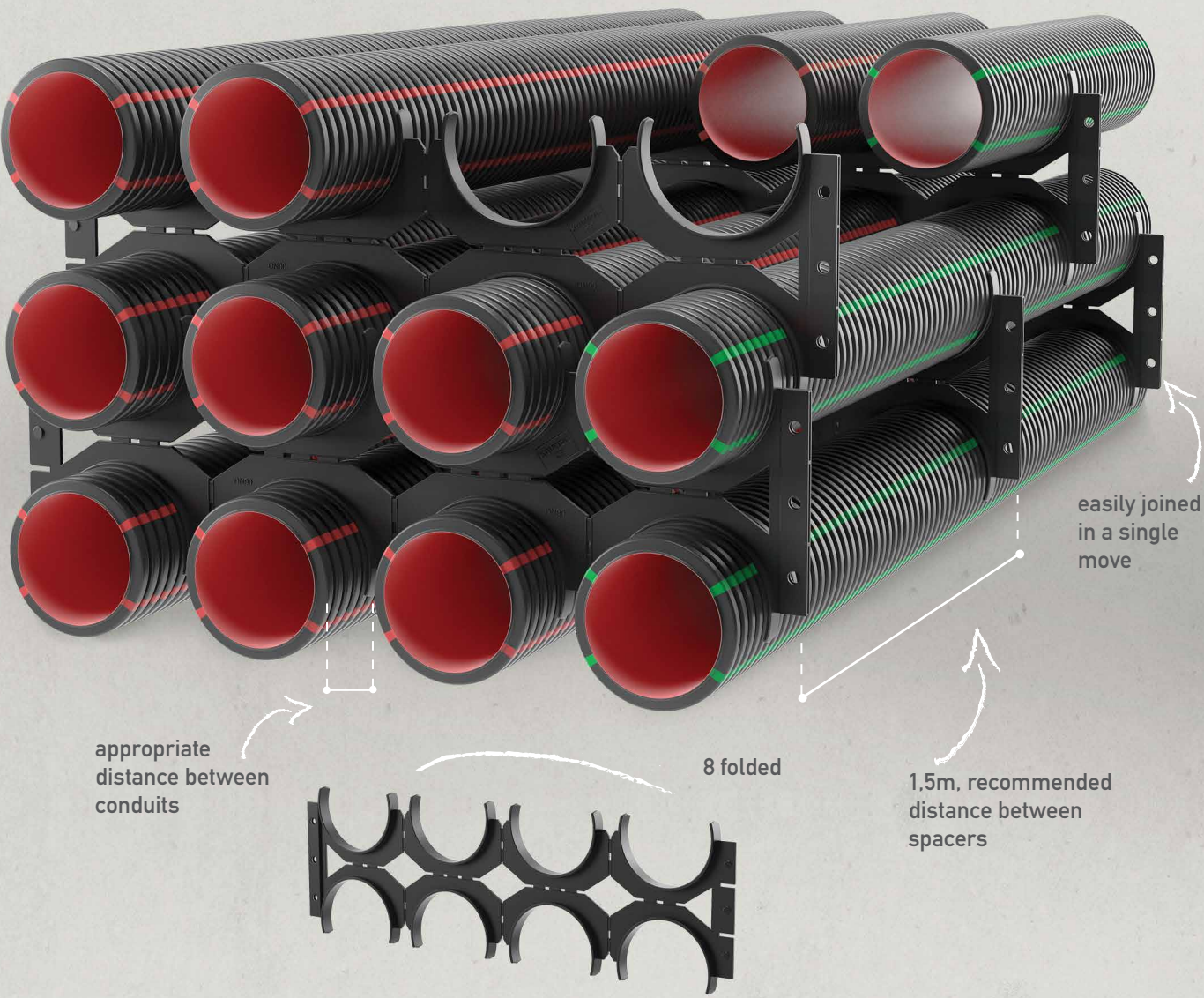
Instructions for Installation

It is recommended that spacers should be placed at 1.5 meters intervals, so that the appropriate distance between them can be maintained.

+ Spacers have two rows of support points (four support points each). They can also be easily joined, thanks to their intelligent connection system. Moreover, their special construction allows them to be easily separated in a single move, in one row or in fewer positions, depending on the requirements of the specific installation. Finally, there is sufficient support width at each position to prevent the creation of point loads on the conduits.

Type	No. of Positions	Part Number	A mm	B mm	C mm	D mm		
Ø50	8(4x2)	6121050	323	101	28	78	45	4500
Ø63	8(4x2)	6121063	376	116	28	91	25	2400
Ø75	8(4x2)	6121075	425	131	28	103	20	1920
Ø90	8(4x2)	6121090	484	147	28	118	72	2016
Ø110	8(4x2)	6121110	575	210	30	140	42	672
Ø125	8(4x2)	6121125	664	233	38	163	32	384
Ø160	4(2x2)	6121160	452	299	60	219	39	468

for the proper installation of
GEONFLEX® N750, GEOSUB® L450
conduits in buried underground networks



Fittings

RAL 9004
black



Standards: EN 61386-24



Packaging parts

RAL 9004
black



All product's certificates are available at
www.kouvidis.com

Connection couplers with hooks

Properties

Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Temperature range	-5 °C to +90 °C
IP ingress protection	IP 40 (coupler connected to GEOSUB conduit) IP 44 (coupler connected to GEONFLEX conduit) IP 68 (coupler bonded with KOUVIDIS sealant)
Ageing resistance	UV stabilized

+ They carry three perimetric internal double hooks on each side and an inner lip for the proper conduits fixing and assembling.

Type	Part number		
Ø32	6101032	12	756
Ø40	6101040	12	576
Ø50	6101050	12	192
Ø63	6101063	15	150
Ø75	6101075	15	15
Ø90	6101090	10	10
Ø110	6101110	5	5
Ø125	6101125	5	5
Ø160	6101160	2	2
Ø200	6101200	3	3

End caps

Properties

Raw material	Halogen free, heavy metals free (RoHS) and specially stabilized thermoplastic HDPE
Ageing resistance	UV stabilized

+ Ideal for the protection of the internal side of conduits. Caps offered with a ventilation hole.

Type	Part number		
Ø32	6100032	40	2520
Ø40	6100040	30	1620
Ø50	6100050	30	720
Ø63	6100063	30	510
Ø75	6100075	15	210
Ø90	6100090	15	120
Ø110	6100110	8	80
Ø125	6100125	8	64
Ø160	6100160	6	6
Ø200	6100200	6	6

Required materials



Adhesive & Sealant

Properties

Consistency	Paste
Cured 2mm after	18 hours
Toxic	No
Solubility in water	Insoluble
Skin over time	Approx. 10 minutes
Expansion	No
Color	White
Working temperature	+5°C to +40°C
Shelf conditions	12-18 months

+ Capable to provide IP68 ingress protection. Free of silicone, isocyanides, solvents and halogens.

Part number		
6001004	6x310ml	-

Required materials



Lubricant for plastic pipes and fittings

Properties

Consistency	Paste
Solubility in water	Insoluble
Color	White
Working temperature	+15°C to +40°C
Ph Value	8.5 - 9.5
Shelf conditions	+5°C to +25°C

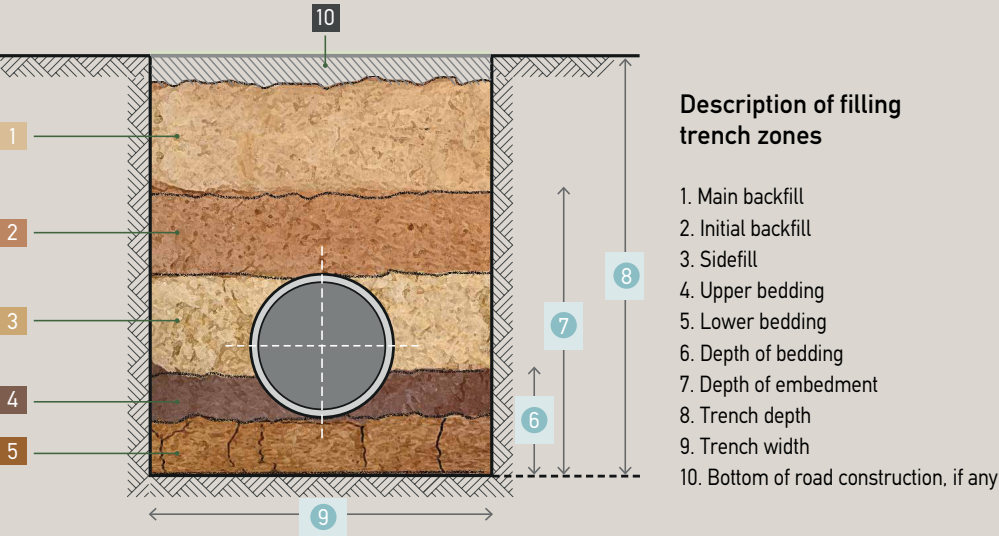
+ Based on synthetic raw materials, is water miscible and fulfills the current requirements of the German DVGW institute after the basis of type examination VP641.

Part number		
6001005	5kg	-

recent
major projects

A few defining projects, that trusted GEONFLEX® & GEOSUB®.

Project	Product	Location	Type of project
Ptolemaida V	GEONFLEX N750	Greece (Ptolemaida)	Infrastructure
Marina Ayia Napa	GEONFLEX N750	Cyprus (Ayia Napa)	Infrastructure
Fraport Airports	GEONFLEX N750	14 airports in Greece	Infrastructure
Robinson Club Luxury Hotel operated by TUI	GEONFLEX N750	Greece (Crete)	Hotels
Stavros Niarchos Foundation Cultural Center	GEONFLEX N750	Greece (Athens)	Culture projects
Halcor Industry	GEONFLEX N750	Greece (Athens)	Industrial properties
Anemos Luxury Grand Resort	GEONFLEX N750	Greece (Crete)	Hotels
Miramare Beach and Spa Hotel	GEONFLEX N750	Greece (Corfu)	Hotels
Nigeria AFAM III (Power Plant 180MW)	GEONFLEX N750	Nigeria	RES projects
Photovoltaic park 14MW	GEONFLEX N750	Mauritania	RES projects
Jumbo & AB Vasilopoulos Department Stores	GEONFLEX N750	Greece (Kefalonia)	Commercial buildings
LIDL Grocery stores	GEONFLEX N750	Greece & Cyprus	Commercial buildings
Public infrastructure project in Skopje - EVN (Public Electricity Company)	GEONFLEX N750	North Macedonia (Skopje)	Infrastructure
Parnassos Ski center	GEONFLEX N750	Greece (Fokida)	Infrastructure
Nana Princess luxury suites & villas	GEONFLEX N750	Greece (Crete)	Hotels
Power interconnection project between Crete & Mainland of Greece	GEONFLEX N750	Greece	Infrastructure
Kozani Photovoltaic Project	GEONFLEX N750 - GEOSUB L450	Greece (Kozani)	RES project
Falirikos Ormos	GEOSUB L450	Greece (Athens)	Infrastructure
Piraeus III Floating Dock	GEOSUB L450	Greece (Athens)	Infrastructure
Smart Park	GEOSUB L450	Greece (Athens)	Commercial buildings
National Gallery of Athens	GEOSUB L450	Greece (Athens)	Culture projects
Ionía Highway	GEOSUB L450	Greece	Infrastructure
Olympia Highway	GEOSUB L450	Greece	Infrastructure
AEK Larnaca football stadium	GEOSUB L450	Cyprus (Larnaca)	Infrastructure
National Observatory of Athens	GEOSUB L450	Greece (Athens)	Culture projects
Thessaloniki metro (subway)	GEOSUB L450	Greece (Thessaloniki)	Infrastructure
Park Lane Resort & Spa	GEOSUB L450	Cyprus (Limassol)	Hotels
Domes of Elounda	GEOSUB L450	Greece (Crete)	Hotels
Athens Underground Railway Extension	GEOSUB L450	Greece (Athens)	Infrastructure
Lyttos Mare	GEOSUB L450	Greece (Crete)	Hotels



Installation guide

Installation of conduits in underground networks requires a series of works that need to be carried out as specified in the design so as to ensure the safety of the works and the installation itself. Some details on best practice for safe installation in accordance with the specification of Standard EN 1610 are given below.

Basic information on trenches

When digging a trench for conduit installation care must be taken in order to ensure a smooth, even underlying surface. It is best that trenching is performed as late as possible before the laying of the conduits and for backfilling to take place as soon as possible after their laying. Some basic accuracy checking criteria for the trench works are:

- » Slope and level of the bottom of the trench in accordance with the differences in height provided for.
- » Dimensions of the excavated sections.
- » Evenness of the trench surfaces, bottom and walls.
- » Removal of surface and ground water.
- » Selection, reuse and temporary storage of the excavated materials and removal of those which are unsuitable.

Trench dimensions

The trenches should have the width and depth specified in the design. This should be the minimum required for a workmanlike installation of the underground network and compaction of the backfilling materials in accordance with the diameter of the conduit and its depth of installation. It is recommended that the minimum width of the trench be the greater than the values shown in the 2 tables below:

Minimum recommended width of trench in relation to outside diameter of conduit	
Nominal Diameter (DN)	Minimum trench width (OD + Xm)
≤ 225	OD + 0,4
OD: outside diameter	

Minimum recommended width of trench in relation to trench depth	
Trench depth (m)	Minimum trench width (m)
< 1	No minimum width required
≥ 1 ≤ 1,75	0,80
> 1,75 ≤ 4,00	0,90
> 4,00	1,00
conduits with outside diameter OD up to 200 mm	

Differences may occur in the above minimum recommended widths in the case of works which do not require a person to be inside the trench or

in other special circumstances. A very important factor that needs to be taken into account at the time of selecting from the above sizes is the installation of more than one conduit in the trench.

Trench materials

The suitability of the ground materials for backfilling the trenches for underground networks depends on their geotechnical properties and their capacity for compaction. The backfill materials can be taken from the excavated materials. When these materials do not meet the requirements, are non existent or unavailable then suitable materials must be chosen as specified in the design. It is best to preclude the presence of backfill materials that are larger than 22 mm in diameter. It is also necessary that the backfill materials are free from organic substances (such as leaves, roots, grass etc.), snow and ice since their water content affects compaction. The trenches must be protected from surface water. It would be good to use pumps to remove and drain off any water towards nearby natural receptacles or other suitable receptacles.

Installation

Reception and transportation to the installation point

The conduits and their fittings must be inspected upon delivery, to see that they bear the correct labels and markings and meet all the necessary specifications laid down in the design. Prior to installation they must be carefully checked for any signs of damage.

Storage

The conduits must be stored in such a way as to ensure that they remain incorruptible. They must not be placed next to open trenches and their

storage area must be clean and free from any foreign bodies such as sharp stones that could cause damage.

Laying

In the case of interruption of the installation process, or due to a temporary break in the works, or in view of connection at a later date, the ends of the conduits must be sealed with protective caps. The caps must not be removed before the connection process. The area of the conduit that will come into contact with the connection fitting (coupler) must be clean and show no signs of damage.

BEST PRACTICE: It is recommended that external caps be used to protect the inside of the conduits from wet and dry particles.

Connection

During the connection process (coupler, trench, etc.) it must be ensured that no foreign bodies can get inside the conduits. In order to achieve this, particular care must be taken when cutting and assembling the conduit.

Trenching

After completion of the works for digging, shaping and inspecting the bottom of the trench, the next step is the laying of the conduit and backfilling with the material provided for in the design. It is recommended that the conduit be laid over a substrate (underlying layer) of 100 mm in the case of soil and 150 mm for stony or hard ground, and covered respectively to a height of 300 mm above the highest point of the outside diameter of the conduit (see diagram).

It is recommended that the filling and compaction of the trench be carried out simultaneously on both sides of the conduit. It is suggested that the compaction, the degree of which must be provided

for in the design, be carried out from the wall of the trench towards the conduit in uniform layers using manual equipment. Compaction using mechanical means must not be performed in an area above the zone of the pipe that is less than 300 mm deep. When choosing the mechanical means of compaction, the number of drillings and the thickness of the layers of compaction, it is necessary to take into account the type of compaction material and the type of conduit that will be laid in the trench. Compliance of the above with the specifications provided for in the design must be a priority.

Inspection

During the installation, in addition to visual checks, the following checks must also be performed: checks for any deformation of the conduits, change in degree of compaction and the adequacy and effectiveness of the laying. Checks on degree of compaction must be carried out throughout the works. The surface on which the conduits are laid must be thoroughly inspected and meet the requirements of the design regarding its degree of slope and evenness.

ATTENTION: The above information comprises an informative guide for the safe digging of trenches and installation of conduits for cable protection as defined by European standard EN 1610. In NO way must be used as a specification or be confused with the specifications laid down in each individual design.

Classification code (acc. to European standard EN 61386-24)

Resistance to impact

Nominal conduit dimension (mm)	Light (L)			Normal (N)		
	Hammer mass (kg) +1% - 0%	Height of fall (mm) 1%	Force of mass (Joule)	Hammer mass (kg) +1% - 0%	Height of fall (mm) 1%	Force of mass (Joule)
≤60	3	100	3	5	300	15
61 to 90	3	200	6	5	400	20
91 to 140	3	400	12	5	570	28
>140	3	500	15	5	800	40

Resistance to compression

Resistance to compression	
Classification	Compression Strength (Nt)
Type 250	≥250
Type 450	≥450
Type 750	≥750



KOUVIDIS laboratory (quality control department).

Label explanation

Product description

GEONFLEX[®] IAS **KOUVIDIS[®]**

ΣΩΛΗΝΕΣ ΔΙΠΛΟΥ ΔΟΜΗΜΕΝΟΥ ΤΟΙΧΩΜΑΤΟΣ HDPE ΓΙΑ ΑΣΘΕΝΗ ΠΕΥΜΑΤΑ
DOUBLE STRUCTURED WALL HDPE CONDUITS FOR TELECOMMUNICATIONS CABLE PROTECTION

CE Black RAL 9004 | Red RAL 3020 Made in GREECE

Ø32 **25m** **N750**

CODE: 2018032
5 205650 116773 >

Σωλήνες με πράσινη σήμανση για την προστασία αγωγών σε υπόγειες εγκαταστάσεις στο έδαφος.
Conduits with green marking for cable protection in buried underground installations.

www.kouvidis.gr Patent Protected: 1009810

GEONFLEX[®] IAS **KOUVIDIS[®]**

ΙΔΙΟΤΗΤΕΣ / PROPERTIES

- Πρότυπα εφαρμογής / Standards applied: EN 61386-24
- Αντοχή στη συμπίεση / Compression resistance: min 750 Nt (type 750)
- Αντοχή στην κρούση / Impact resistance: Normal duty
- Βαθμός στεγανότητας / Ingress protection: IP44 / IP68 (με χρήση καλλωσ KOUVIDIS)
- Θερμοκρασιακή αντοχή / Temperature resistance: -5°C / +90°C
- Δεν διαδίδει τη φλόγα / Flame retardant: —
- Ελεύθερο αλογόνων / Halogen free: •
- Αντοχή στη γήρανση (UV) / UV stabilized: •
- Μη ελκυστική τροχή για τρωκτικά / Rodent repellent: •
- Μειωμένες τριβές (slip) / Low friction: •
- Ανταστατική Τεχνολογία / Antistatic Technology: •

905 S

CE ISO 9001 ISO 14001 ISO 45001 RD 201972 VDA 6.3 RoHS REACH ANTI-STATIC +30 2810 831 500 ΤΕΧΝΙΚΗ ΥΠΟΣΤΗΡΙΞΗ TECHNICAL SUPPORT

Nominal outer diameter

Length

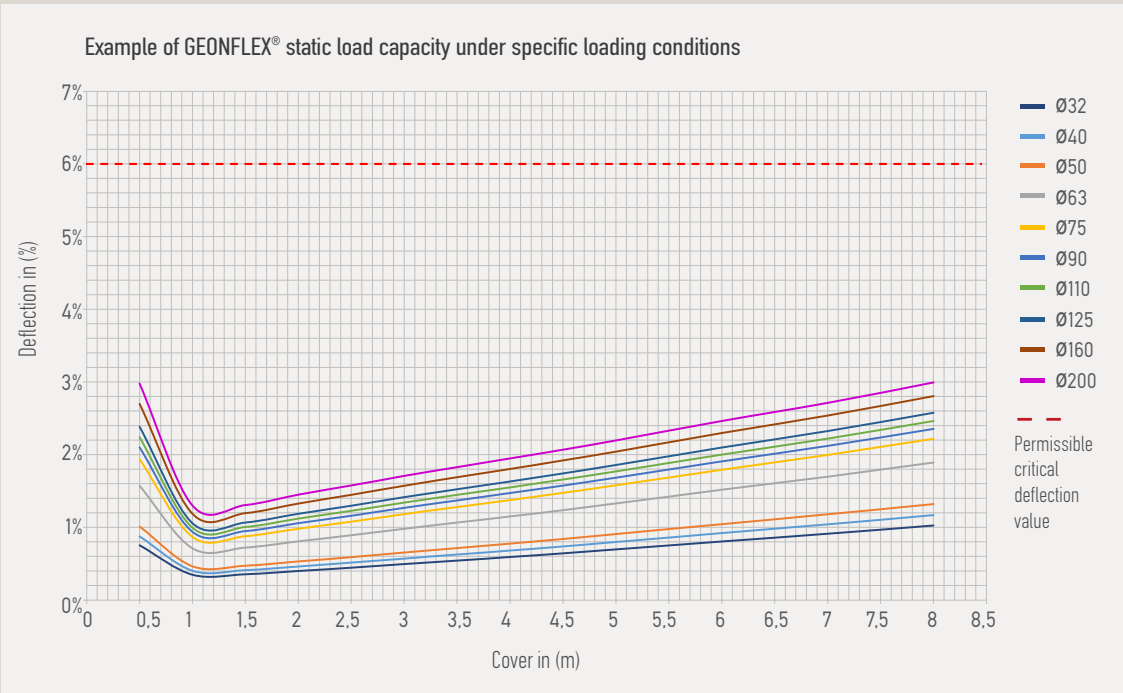
Mechanical properties

Deflection value

(example with deflection degree of GEONFLEX[®] pliable conduits under certain conditions)

Basic parameters:

- CEN / TR 1295-3: 2007 " Structural design of buried pipelines under various conditions of loading - Part 3: Common method"
- Underground installation with embankment
- Moderate traffic load conditions
- Single pipe & cable installation only
- Without affecting the aquifer
- Pipe zone: Soil of Gs2 - SP3
- Degree of bedding: 180 degrees
- Soil: Gs4 - SN2
- Soil and backfill concentration: 90% - 92% Dpr



The above diagram is an example of GEONFLEX[®] pipes strength in specific static load under certain load conditions. It is a guide in order to be understood the degree of deflection. In NO way must be used as a specification or be confused with the specifications laid down in each individual study.

5 things
to remember...

- 1

Safety

The longitudinal lines, in indelible color that are incorporated on the outer conduit's corrugated wall, protect the personnel performing technical installation or maintenance tasks by warning them about the riskiness of the buried underground pipelines. At the same time, they facilitate engineer's work providing a better and safer way of networking.
- 2

Weight

Due to the specific geometry of their external wall they achieve high mechanical strength with a significantly lower weight than the single wall conduits. Thus they are less weight, a fact that facilitates their storage, transportation and installation.
- 3

Resistance

GEONFLEX® conduits achieve the maximum mechanical strength that the Standard for buried underground networks EN 61386-24 defines, a fact that makes them suitable to be installed in smaller trench depths, when engineer approves so, reducing significantly the installation cost while maintaining the safety at the maximum level.
- 4

Low cost

Their reduced weight, their easiness in loading and installation and their easy cutting using only basic professional cutting tools ensure great installation cost and time savings.
- 5

100% environmentally friendly

They are made from high density polyethylene (HDPE), halogen free and fully recyclable with the lowest possible environmental footprint.

... one more thing about GEONFLEX® conduits

Their inner wall incorporates two innovations:

- 1

They are not an attractive food to rodents due to the particular ecological additive they contain in their internal layer.
- 2

They incorporate a special material (slip) on their internal smooth surface to facilitate easier introduction and guiding of cables thanks to the significant (up to 50%) reduction in friction.

LEGEND

Nominal outer diameter (mm)

Nominal minimum inner diameter (mm)

Packing (m/coil)

Normal
(According to EN 61386-24, impact test)

Light
(According to EN 61386-24, impact test)

Product Conformity to all requirements of relative European Directives

Certification body of Quality Management System
EN ISO 9001

Bars (m)

Bar's Weight (kg)

Coil's Weight (Kg)

Halogen free product

Patent protected product

The product and its production process are inspected and approved by VDE German institute

Certification body of Environmental Management System
EN ISO 14001

Packing (pieces/box)

Bigger Packing for fittings (pieces)

Double wall conduits loaded on a truck (m)

Environmentally friendly product. Halogen free, heavy metals free (RoHS), low smoke, SVHC-free (REACH) with 100% eco-friendly packaging

The product does not contain hazardous substances acc. to 2011/65/EE RoHS Directive. Certification body VDE

Certification body of Occupational Health and Safety Management System
ISO 45001

**MANUFACTURING
EXCELLENCE AWARDS
2021** Τα βραβεία της Ελληνικής Βιομηχανίας

WINNER



ISO 9001



ISO 14001



ISO 45001



ID 201572



REACH
Compliant

KOUVIDIS was founded in 1979 when Emmanuel Kouvidis, an electrician-installer, decided to quit his job and set up a business of his own in order to produce high quality conduits which would not break and which would ensure the safety of electricians-installers.

His vision came true and KOUVIDIS evolved to one of the largest Greek plastic pipe manufacturers characterized by continuous development and innovation.

Keeping its people at the heart of all its actions and aiming to the sustainable development and the cycling economy, KOUVIDIS will continue to provide value added products and services and to constantly improve the installer's work.

Learn more about
our 40+ years journey

www.kouvidis.com

K KOUVIDIS®

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