



GM PLAST A/S

30 years of innovation and knowledge

Products such as micropipe, multipipe and flatliner is all products designed, produced and brought on the market by **GM**.

GM started the development and rolling out of the biggest **FTTH** project in 1999. The project is still alive and increases every day anno 2007.

Experiences from the first project, as well as many following has made the foundation for **GM**'s huge expertise in **FTTH**.

There is a great difference between developing and afterwards check in minor test instead of rolling out in full scale. Functionality and manpower has to go hand in hand to succeed.

Development of new pipe- and cablesystems for backbone- and citynet has also been a huge priority.

established in 1975, with a conventional production of pipe and cable cover band.

- think innovatively, not afraid to challenge traditions with new ground-breaking technology.
- is a high technology company with great importance on quality and efficiency.
- produce plasticpipes and pipesystems, mainly to the tele- and electricitysector.
- has saleoffices and partners on the most important markets in Europe.
- is in the middle of a strong expansion in Eastern Europe and on the African continent.



GM PLAST A/S is centrally located in Hedensted, right at the exit 58 on the E45.



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GM DRUM COLLECTION



TYPE 1 : 1200 X 375

Flange diameter : 120,0 cm
Flange diameter : 37,5 cm
Core diameter : 50,0 cm
Flange Thickness : 2,4 cm



TYPE 2 : 1200 X 700

Flange diameter : 120,0 cm
Flange diameter : 70,0 cm
Core diameter : 50,0 cm
Flange Thickness : 2,4 cm



TYPE 5 : 1650 x 1200

Flange diameter : 165,0 cm
Flange diameter : 120,0 cm
Core diameter : 60,0 cm
Flange Thickness : 4,6 cm

GM DRUM COLLECTION



TYPE 7 : OCTO DRUM

Flange diameter : 220,0 cm
Flange diameter : 120,0 cm
Core diameter : 80,0 cm
Flange Thickness : 5,3 cm



Type 10 : 2300 x 1200

Flange diameter : 230,0 cm
Flange diameter : 120,0 cm
Core diameter : 80,0 cm
Flange Thickness : 6,2 cm

GM MICRODUCT DL

technical specifications

DIRECT LAID



Size/ Name	Outside Diamtr. +0,15/- 0,05	Wall Thickness +0,1/- 0,1	Inside Diamtr. +0,55/-0,05	Density	Pull Force	Pull Burst	Pressure Burst	Drum Size	Meters pr. Drum
10/6	10,00	1,9	6,0	>950	300N	1300N	>50 BAR	1200x800	3600
12/8	12,00	1,9	8,0	>950	300N	1300N	>50 BAR	1200x800	3600
14/10	14,00	1,9	10,0	>950	300N	1300N	>50 BAR	1200x800	3000
16/12	16,00	1,9	12,0	>950	300N	1300N	>50BAR	1200x800	2100
18/14	18,00	1,9	14,0	>950	300N	1300N	>50BAR	1200x800	1800
20/16	20,00	1,9	16,0	>950	300N	1300N	>50BAR	1200x800	1500

GM MICRODUCT SUB

technical specifications



Size/ Name	Outside Diamtr. +0,2/- 0,1	Wall Thickness +0,1/- 0,1	Inside Diamtr. +0,1/-0,2	Density	Pull Force	Pull Burst	Pressure Burst	Drum Size	Meters pr. Drum
5/3,5	5,0	0,5	3,5	>0,950	70N	180N	>30 BAR	1200x400	6000
7/5,5	7,0	0,75	5,5	>0,950	80N	230N	>30 BAR	1200x400	6000
10/8	10,0	2,0	8,0	>0,950	150N	450N	>30 BAR	1200x400	2500
12/10	12,0	1,0	10,0	>0,950	150N	520N	>30 BAR	1200x400	2000
14/11,4	14,0	1,3	11,4	>0,950	150N	520N	>30 BAR	1200x400	2000

COLOURCODE

To prevent miscommunication and installation errors, our complete line of flexible ducts is color-coded. Color applications are available in solid hues or in natural shade with a colored stripe.



GM MICRODUCT SUB

technical specifications



GENERAL

- **GM MICRODUCT SUBs** are high quality products made from only the best raw materials. All ducts are made at our plant in Hedensted under strict and constant surveillance, and continuous testing, in order to ensure that we always deliver the best quality possible.
- **GM MICRODUCT SUB** are delivered on returnable drums.
- **GM MICRODUCT SUB** are manufactured with an internally rifled surface. Smooth internal surfaces are available upon request.
- All **GM** ducts are extruded from pipe grade, virgin high density polyethylene (PEHD) compound according to Danish and international standards.

RAW MATERIAL

a homopolymer HDPE grade, characterized by high stiffness, high rigidity and high flow.

Properties	Test based on	Typical value/unit	
Tensile Strength at Yield ¹	ASTM D 638	30 MPa	4350 psi
Tensile Strength at Break ¹	ASTM D 638	> 16 MPa	> 2300 psi
Elongation at Break ¹	ASTM D 638	> 450 %	
1% Secant Modulus ²	ASTM D 638	1050 MPa	152500 psi
IZOD Impact	ASTM D 256	12 kJ/m ²	5.7 ft-lb/in ²
Shore Hardness, D	ASTM D 2240		64
Environmental Stress Crack Resistance ³	ASTM D 1693		17 hrs
Environmental Stress Crack Resistance ⁴	ASTM D 1693		20 hrs

The properties have been measured on compression sheets, prepared according to ASTM D 4703.

(1) Specimen type T4 / thickness 3 mm (118 mil); speed of testing 50 mm/min (1970 mil/min).

(2) Specimen type T4 / thickness 3 mm (118 mil); speed of testing 5 mm/min (197 mil/min).

(3) Conditions B, F50, 10 % Igepal

(4) Conditions B, F50, 100 % Igepal

Can - in principle - be used in food contact applications in various EU Member States and in the USA (FDA). Migration or use limitations may apply.

PRODUCT PERFORMANCE

- **TENSILE** - recommended at installation 150N
- **COMPRESSION** - >30 bar/ 2 hrs., on drum >10 bar
- **BENDING** - >20 x diameter of duct at 20C⁰
- **OVALITY** - max. 3,5% in production, on drum max. 8%.
- **UV STABILIZED** - yes
- **MASTER BATCH** - 1-2%

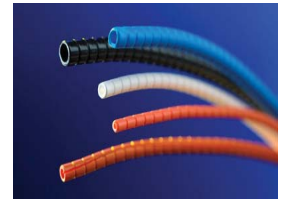
All drums are calibrated with a bullet matching 8% ovality and pressure tested with 10 bar.

WORKING WITH THE PRODUCTS

- **BLOWING RADIUS** - recommended radius 1600 to 1800 mm
- **INSTALLATION TEMPERATURE** - minus 10 °C to 50 °C
- **MARKING - FLATLINERs** are available in solid orange, opaque, or stripes dictated by the GM color-code. The customer can also request their firms name applied to the **FLATLINER**.

FTTH INDOOR FIBRE PROTECTION

zero halogen low smoke fire retardant



The FTTH INDOOR FIBRE PROTECTION system(FIFP) offers the ultimate protection to optical fibres and cables. It provides protection against crushing and kinking of fibres and hazardous tensile loads, while limiting any bends to an acceptable radius. The unique FIFP patented technology which makes very hard materials flexible, is specifically designed with this purpose in mind. FIFP provides an entire, selfmanaging solution to the routing of fibre.

Patch cords made from the 3mm FIFP is 5 times more resistant to crushing than conventional patch-cord in a Transverse Crush Resistance test that replicates effect of cable crush at jumper crosses. Due to its rigid flexibility and buckling resistance pigtails made from the 3mm FIFP can be easily installed in FTTH deployments by pushing into Microducts so avoiding costly blowing or the stresses and strains of pulling.

Applications Used in any fibre application where enhanced protection is necessary.

FIFP can be used for both short and long runs, from patch cords to industrial installations. Slit FIFP can be retro fitted using the appropriate Zipping Tool where the cabled fibre is already installed or is pre-terminated.

FEATURES & BENEFITS

- Super low friction FIFP lining
- Superior crush protection and bend limiting
- Very smooth inner bore
- Available with pull cord
- Permits very quick fibre installation
- Sequential length markings
- Standard reel sizes of 100m, 500m and 1000m

For Outside Plant (OSP) applications the DVC™ Microduct is available in either UV-stabilised polypropylene (UVPP) or high density polyethylene (HDPE) materials.

TUBE SIZES

- 10 mm OD x 6.4 mm ID
- 8 mm OD x 5.4 mm ID

CABLE DUCTS

Low friction

The unique GM TAPE SOLUTION

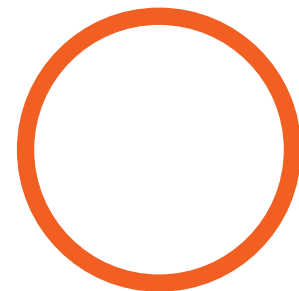
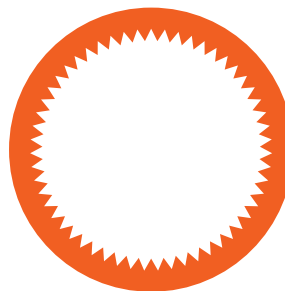
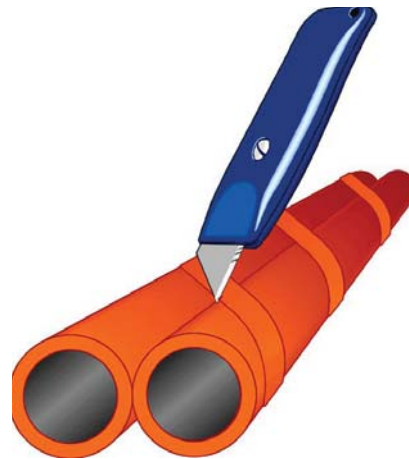
The taped solution brings together the cable ducts in a block. The tubes are taped together for optimized decoiling and easier handling of the cable ducts in the trenches. The tape is easy removable and leaves no problems when mounting the sleeves.

By roadcrossings you can easily cut up the tape to loosen the cable ducts. Loose cable ducts has the advantage that they more easily comes through if by drilling an ovality in the the empty-duct has occurred.

GM 's tape system combines the needs for holding together in the trenches and loose cable ducts in roadcrossings.

GM 's cable ducts for fibreblowing are lowfriction ducts, manufactured with or without a lubricant.

GM manufactures a large number of various tubes and pipes. Colour, inside surface e.t.c can all be changed upon customers request.



GM- WOODEN DRUM

GM-WOODEN DRUM mini

GM-STEE L TROMLE

DRUM DIAMETER	230 cm	280 cm	280 cm
CORE DIAMETER	110 cm	120 cm	280 cm
DRUM WIDTH	120 cm	160 cm	280 cm

OF PIPES ON DRUM

	●	●●	●●●	●●●●	●	●●	●●●	●●●●	●	●●	●●●	●●●●
Ø 32	3.000	1.400	900	650	6.000	2.900	1.800	1.300	6.000	2.900	1.800	1.300
Ø 40	2.000	900	600	400	4.000	1.900	1.250	900	4.000	1.900	1.250	900
Ø 50	1.200	600	400	250	2.500	1.250	800	600	2.500	1.250	800	600

GM CABLE COVER BANDS

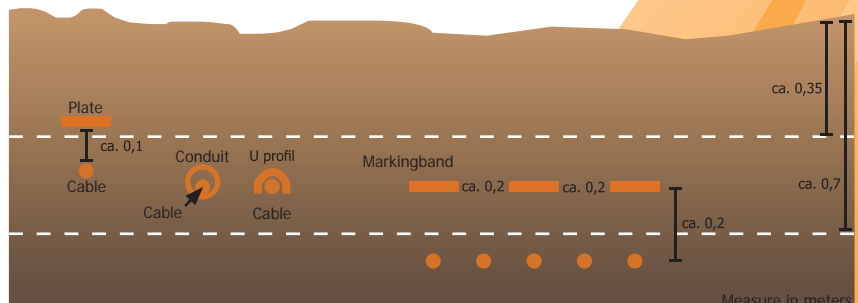
GM cable cover bands are made from a soft PE which makes the cover band easy to handle when installing in a trench. Can be supplied in other dimensions or colours to suit the customers requirements. Also manufactured with individual texts and required dimensions.



Thickness x width in mm	Lenght/ pr. roll in m.	Colours: red, blue orange	Demko approval	Pallet size in meter	GM-code number
1,5x75	50/100	X		3000	11-1,5/075
1,5x100	50/100	X		3000	11-1,5/100
1,5x150	50/100	X		1500	11-1,5/150
1,6x100	50/100	X		3000	11-1,6/100
1,7x100	50/100	X		3000	11-1,7/100
1,8x100	50/100	X	X	2700	11-1,8/100
2,0x100	50/100	X		3000	11-2,0/100
2,2x170	50	X	X	2000	11-2,2/170
2,2x200	50	X	X	1600	11-2,2/200
2,8x100	50/100	X		3000	11-2,8/100
3,0x100	50/100	X	X	3000	11-3,0/100
3,4x170	50	X	X	2000	11-3,4/170
3,4x200	50	X	X	1500	11-3,4/200
3,5x400	25	X		675	11-3,5/400
3,5x600	25	X		300	11-3,5/600
5,0x500	25	X		300	11-5,0/500

To the left cables with mechanical protection in 0.35 to 0.70 below the finished surface.

To the right cables without protection in 0.70 or deeper below the finished surface, but shown with the cover bands.



GM CABLE COVER PLATE & MITRE

GM CABLE COVER PLATE



Recommended for
FLATLINER



Width in mm	Lenghts per roll/m.	Colours Red	Pallet size in meters
3,5x110	1-2	X	2000
3,5x180	1-2	X	2000

GM cable cover plates can be supplied with or without edges. Can be supplied in various lenghts and colours to suit the customers requirements.

GM CABLE COVER MITRE

GM cable cover mitre is a special product and is supplied in rolls of 50 meters. Can be supplied in different lenghts and colours to suit the customers requirements also complete with individual text indentification.



Width in mm	Lenghts per roll/m.	Colours Orange	Pallet size in meters
1,5x150	2-6-50	X	5000
2,0x150	2-6	X	5000
3,5x150	2-6	X	5000

GM MARKINGBAND & WARNING MESH

GM MARKING BAND

GM marking band is strong and does not uncoil easily when not required. Can be supplied in various lengths and colours complete with individual text to suit the customers requirements. Can also be supplied with an intergrated metal detection core.

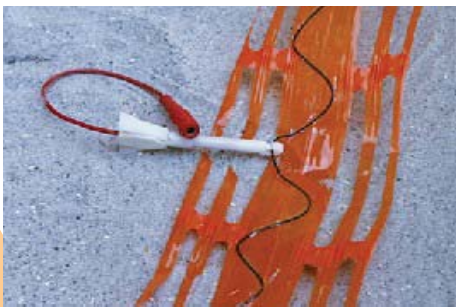
Thicknes x width in mm	Text (printing)	Lenghts in meters	Colour	GM-code numbers
0,30x25	Warning! Power cable below (D)	250	Red	15-0010-00
0,30x25	Warning! Main water pipe below	250	Blue	15-0020-00
0,30x25	Warning! Tele cable below invisible laser light—Danger to eyesight	250	Orange	15-0011-10
0,30x25	Warning! Tele cable below	250	Orange	15-0011-20
0,30x25	Warning! Tele / Television cable below	250	Orange	15-0011-00
0,05x50	Warning! High pressure steam pipe below	500	Purple	15-0030-00
0,05x50	Warning! Television cable below	500	Orange	15-0021-20

GM ADVARSELNET

GM warning mesh is used to lay over cables, pipe lines and conduits. The meshes cover size is designed so that if an excautor should come in contact with it the teeth of the digger bucket catch the mesh thereby giving the operators ample warning of possible damage to underlying installations. The mesh is flexible and will follow up with the diggers bucket. GM warning mesh can also be supplied complete with an intergrated metal detection core and individual text to suit the customers requirements.

Width in mm	Lenghts per roll/m.	Various colours	GM-code numbers
100	100	X	15-100/100
200	100	X	15-200/100
300	100	X	15-300/100
500	100	X	15-500/100
1000	50	X	15-1000/100

GM DETECTABLE MARKING BAND & MESH



Telepoint for quick error detection.



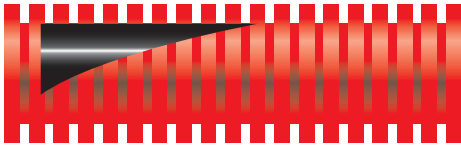
Tel-splice-connectors and connector plier for quick connection of the metal detection core.



Detectable marking band

GM CABLEDUCT

Corrugated/smooth, material: PE



GM Corrugated cablepipe with a smooth inside complete with coupler. Also supplied in other colors and lengths upon request.

Diameter out/in in mm	PEH 6 meters w/coupler	Colors: Red, orange	Bundle size in meters	GM-item number
50/42	X	X	1170	17-050/042
75/63	X	X	978	17-075/063
90/77	X	X	270	17-090/077
110/95	X	X	402	17-110/095
117/103	X	X	270	17-117/103
120/100	X	X	270	17-120/100
125/108	X	X	288	17-125/108
160/135	X	X	198	17-160/135
175/150	X	X	198	17-175/150
200/176	X	X	120	17-200/176

GM FLEXDUCT

Corrugated/smooth, material: PE

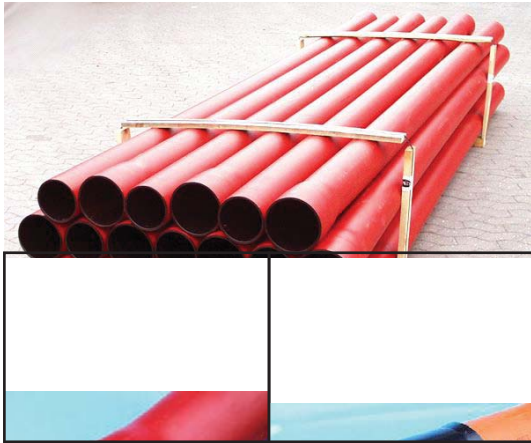


Reeled GM flexpipe w/coupler has a smooth inside, which increases strength and minimizes the frictional resistance. Is also produced in other colors and lengths upon request.

Diameter out/in in mm	PEH in 50m. w/pullcord	Color: Red, orange	GM-item number
40/31	X	X	12-040/031
50/42	X	X	12-050/042
63/53	X	X	12-063/053
75/63	X	X	12-075/063
90/77	X	X	12-090/077
110/95	X	X	12-110/095
120/100	X	X	12-120/100
125/108	X	X	12-125/108
160/135	X	X	12-160/135
175/150	X	X	12-175/150
200/176	X	X	12-200/176

GM CABLEDUCT

Smooth, material: PE



Diameter out/in in mm.	6 meters lengths w/ coupler	Color: Red, orange	Frame size in meters	GM item number
40/35	X	X	570	13-040/035
50/46	X	X	570	13-050/046
63/57	X	X	570	13-063/057
75/69	X	X	570	13-075/069
82/78	X	X	288	13-082/078
90/82	X	X	288	13-090/082
110/102	X	X	288	13-110/102
160/150	X	X	156	13-160/150

GM smooth PEH cablepipe is a strong cablepipe, with a minimal frictional resistance when conveying cable. Is also produced in other colors and lengths on demand. Also delivered with coupler.

GM CABLEDUCT

Smooth, coiled, material: PE



Diameter out/in in mm.	Coils in 100 m	Color: Red, orange	GM item number
32/28	X	X	08-032/028
40/35	X	X	08-040/035
50/44	X	X	08-050/044
63/56	X	X	08-063/056
75/68	X	X	08-075/068
82/72	X	X	08-082/072
90/79	X	X	08-090/079
110/96	X	X	08-110/096

GM smooth PEM cablepipe in coils, is especially used for roadcrossings. Smooth cablepipe in coils has the big advantage that a minimum size of trench or manhole is required. The smooth inside minimizes frictional resistance.

GM FLEXPipe

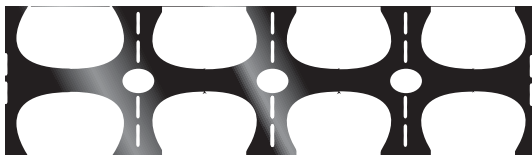
coiled, corrugated, material: PE



Is also produced in other colors and lengths upon request.

Diameter out/inside in mm	PEH in 50 mtr. w/ pullcord	Colors: Red, orange	GM-item number
25/18	w/pullcord	white	18-025/018
46/40	X	X	18-046/040
50/42	X	X	18-050/042
58/50	X	X	18-058/050
61/50	X	X	18-061/050
75/63	X	X	18-075/063
93/80	X	X	18-093/080
94/80	X	X	18-094/080
110/95	X	X	18-110/095
128/113	X	X	18-128/113
160/145	X	X	18-160/145
200/180	X	X	18-200/180

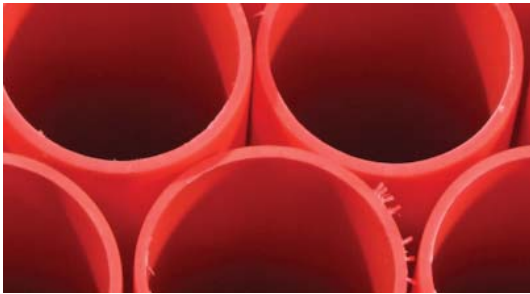
GM SPACERS



Measure in mm	2-4-6-8 pcs. spacers	GM item number
50	X	26-D050
63	X	26-D063
75	X	26-D075
90	X	26-D090
110	X	26-D110
117	X	26-D117
120	X	26-D120
125	X	26-D125
160	X	26-D160
175	X	26-D175
200	X	26-D200

GM CABLEDUCT

smooth, w/ coupler, material: PEH



GM smooth PEH cableduct with couple is a dimensionally stable cableduct, when glued it offers watertight solution, ideal for casting and digging. The PEH ensures minimal friction in the pipe. Is also produced in other colors and lengths upon request.

Diameter out/inside in mm	PEH in 6 meter w/ coupler	Colors: Red, orange	Frame size in meters	GM item number
25/21	X	X	960	22-25/21
32/28	X	X	570	22-32/28
40/36	X	X	570	22-40/36
50/46	X	X	570	22-50/46
63/59	X	X	570	22-63/59
75/70	X	X	570	22-75/70
90/85	X	X	288	22-90/85
110/104	X	X	288	22-110/104
125/119	X	X	288	22-125/119
160/152	X	X	156	22-160/152
180/171	X	X	156	22-180/171
200/190	X	X	150	22-200/190
250/238	X	X	96	22-250/238
280/268	X	X	54	22-280/268
315/302	X	X	54	22-315/302

GM SPLIT DUCTS



GM's split ducts (PEH) are due to a new construction easy to slide together - no tools necessary. Even when assembled in the trenches with dirt and sand, they slide together without any problems. It is especially useful when moving already laid cables or by repair.

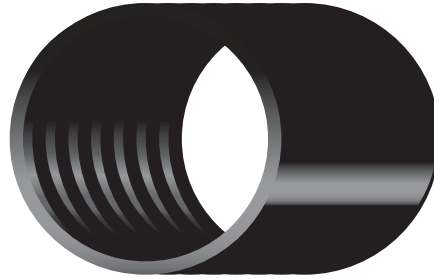
Diameter out/inside in mm	Meters pr. unit	Colors: Red, orange	Frame size in meters	GM item number
58/50	5	X	525	13-058/50
110/100	3	X	162	13-110/100
160/138	3	X	72	13-160/138
120/110	3	X	144	13-120/110

GM DOUBLE COUPLERS

material: PE, PVC or Polycon.

GM double couplers are manufactured in the same sizes as the extensive GM duct program. Corrugated double couplers is also manufactured as a watertight coupler by mounting a rubbering between the grooves.

Also supplied in other dimensions upon request.



GM ENDCAPS

Manufactured in the same sizes as the extensive GM duct program.

Also supplied in other dimensions upon request.



GM PROTECTIONCAP

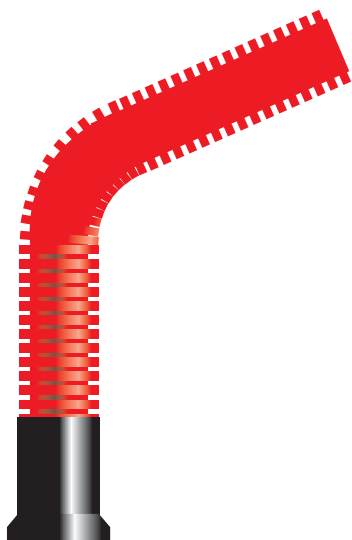
GM protectioncap prevents dirty and rodents to enter the duct.

Manufactured in dimentions \varnothing 40-160 mm.



GM CABLEDUCT BEND

Corrugated/Smooth, material: PE

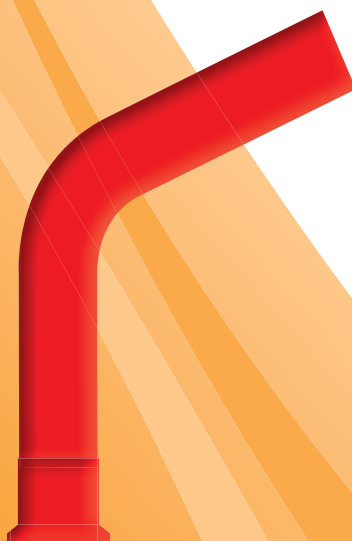


Ydre/indre out/inside in mm	45 & 90 degrees	Bending radius in mm	Bending length in mm	Colour: Red, orange	GM item number
50/42	X	550	1000	X	36-050/042
63/52	X	550	1000	X	36-063/052
75/63	X	550	1000	X	36-075/063
90/75	X	800	1500	X	36-090/075
110/95	X	800	1500	X	36-110/095
117/103	X	800	1500	X	36-117/103
120/100	X	800	1500	X	36-120/100
125/108	X	800	1500	X	36-125/108
160/136	X	800	1500	X	36-160/136
175/150	X	800	1500	X	36-175/150
200/176	X	800	1500	X	36-200/176

Also supplied in other colors an lengths upon request.

GM CABLEDUCT BEND

Smooth, material: PE



Ydre/indre out/inside in mm	45 & 90 degrees	Bending radius in mm	Bending length in mm	Colour: Red, orange	GM item number
32/28	X	3	350	X	26-032/028
40/36	X	300	450	X	26-040/036
50/44	X	550	850	X	26-050/044
63/57	X	550	850	X	26-063/057
75/68	X	550	1100	X	26-075/068
82/75	X	550	1100	X	26-082/075
90/82	X	550	1100	X	26-090/082
110/100	X	550	1100	X	26-110/100
160/150	X	800	1500	X	26-160/150

Also supplied in other colors an lengths upon request.

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