



**NEW PRODUCTS INDUSTRIES CO. LTD** 

# Polyethylene Corrugated Duct (PEC) and HDPE Ducts

for Power & Telecommunication



Distributed by National Marketing Est. Co. Ltd.



0003052068 Project No: Class: 1613 Product Name: Polyethylene Pipe Product Type: Polyethylene Pipe Name of Listing Company: New Products Industrial Co., Ltd. Address of Listing Company: Industrial Area PO Box 460 Jeddah, 21411 Saudi Arabia Customer ID: 148015-1 Customer website w.neproplast.com Prepared by Revi Stanley M. Z Brace D also Stanley M. Ziobro Bruce Wood Senior Engineer Technical Team Manager 11. Richard Dunne Manager of Fire P April 24, 2015 Date of Approv 1 Boston--Box 9102 -1 MA 02062 Page 1 of 6



# FOREWARD

NEPROPLAST (New Products Industries) was established in the 1969 as the first manufacturing facility to introduce the uPVC piping systems to the market in Saudi Arabia. Since its establishment, NEPROPLAST has followed a strict policy in producing high quality pipes. Using state of the art equipment and tools in its production facilities, hiring a highly trained professional staff, and working with a very experienced team of consultants in the industry. The initial production of NEPROPLAST uPVC pipes were manufactured according to British Standard Specifications BS 3505/3506. At a later stage, NEPROPLAST started to manufacture pipes and fittings according to International Specifications ISO. NEPROPLAST actively participated with Saudi Arabia Standard Organization SASO to set the Saudi Arabian Standard SAS 14/15/1396. In the mid 80s, NEPROPLAST started the production of PVC pipes and fittings according to ASTM standards for schedule 40, schedule 80, and CPVC pipes for sch80. By producing a wide range of pipes and fittings according to different standards, NEPROPLAST has established for itself a strong position in the market to serve the construction industry in the fields of water network pressure lines, sewerage and drainage non-pressure lines, and electrical & telecommunication conduits . NEPROPLAST made its pipes and fittings available in both options of Rubber Ring or Solvent Cement jointing systems.

In 2009, NEPROPLAST made a significant move into modern, heavy metal free stabilizers for all its uPVC & cPVC products. A move which ensured total elimination of toxicological content throughout the entire NEPRO-PLAST product range.Organic stabilizers pipes and fittings ensure a safe drinking water supply, free of any possible toxic traces which can develop through the use of heavy metal uPVC stabilizers.

All NEPROPLAST drinking water products are now accreditised through NSF, proof of its excellent health safety factor.

NEPROPLAST added to its products portfolio the production of Polyethylene pipes (HDPE) in 2009. NEPRO-PLAST HDPE products range covers pipes and ducts to serve the water, gas, electrical, and telecommunication applications. NEPROPLAST recently introduced to the market the Polyethylene Corrugated-Optic-Ducts (COD) as a unique product for fiber optic and electrical cabling installations.

All NEPROPLAST products are marketed and sold through National Marketing Est. Co LTD. which has more than 25 branches covering all cities and urban areas across the Kingdom of Saudi Arabia. National Marketing has an export department responsible for exporting NEPROPLAST products to Middle East and North African (MENA) markets. In addition to NEPROPLAST products, National Marketing Est. Co. imports a wide range of fittings, valves, solvent cements, and other accessory components. Nowadays, National Marketing Est. Co LTD. is considered the largest trading company in Saudi Arabia that has all kinds of plastic pipes, fittings, valves, and cements available in its stocks for all traders and contractors in the Saudi market.

Both NEPROPLAST and NATIONAL MARKETING strive to be the largest quality leader in the supply of plastic piping systems to serve the water, gas, electrical & telecommunication sectors across the Middle East.



# INTRODUCTION

COD stand for Corrugated Optical Duct, specialized products, COD is a Multiple channel cable duct with plain surface, specially coated inner pipe and corrugated outer pipe as an integrated single body. both are manufactured from high Density Polyethelene(PE) materials. Possible combinations of inner pipe sizes can be done upon customer,s reuest. Hence, Combination is flexible, resistance enabling a rolled-on spool regardless of numbers of subduct built-in which can be coiled over 500m. COD is possible to transport easily and therfore reduce labour cost as well as faster installation and lower the construction cost.

COD open the new era of the telecommunication back bone with its built-in multiple sub ducts inside of the corrugated duct, with very distinctive differencec from the conventional telecommunication PVC ducting System. Telecommunication companies agree on the proven benifets of this product with its great economics and convenient installation than any other system.

COD application services include Construction of underground ducts for High Speed Internet Superhighway networks Cable Television CCTV on the express highway, high & low voltage power cables, Video Phone Communication Downtown / Business quarters infrastructure Undersea's infrastructure.





Fig: 1.c - COD Pipes

All contact surfaces between main duct and built-in sub-ducts shall fuse together during extrusion process. This fusion shall prevent movement or twisting of subducts inside the main COD duct (in finished products).

COD ducts are used to provide a single and continuous duct laying operation from one point to another between manhole to manhole, without any cut. It can be laid directly into trench at standard depths even without sand bedding. Concrete encasement is normally not required.

### **Product Range:**

NEPROPLAST COD is available from diameter 90 mm to diameter 160 mm in coils and bars

Madal	Decian	Corruga	ted Duct		Sub Duct		No.Sub	
wodei	Design	O.D (mm)	I.D (mm)	O.D (mm)	THK (mm)	I.D (mm)	Duct	Application
28 x 3 Lines	8	90.0	70.0	33.0	2.5	28.0	3	FOC installations
28 x 4 Lines		100.0	80.0	33.0	2.5	28.0	4	FOC installations
28 x 5 Lines	8	110.0	90.0	33.0	2.5	28.0	5	FOC installations
32 x 4 Lines		110.0	90.0	38.0	3.0	32.0	4	FOC installations
36 x 3 Lines	8	110.0	90.0	42.0	3.0	36.0	3	FOC installations
36 x 4 Lines		120.0	100.0	42.0	3.0	36.0	4	FOC installations
50 x 3 Lines		160.0	125.0	59.0	4.5	50.0	3	FOC installations

#### Table 1:

### Standards

NEPROPLAST corrugated pipes for cable protection are produced according to EN50086 2-4 (DIN 16961, NFC 68-171), i.e. EN 13476 standards

### Color

The standard color is orange and is offered in a variety of other colors.





# INTRODUCTION

### Marking





### COD Specification

The following international and/or national standards are integral part of this specification:

ASTM F 405 Standard Specification for Corrugated Polyethylene Pipe and Fittings

ASTM D 2412 Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe By Parallel-Plate Loading

ASTM D 1505 Standard Test Method for Density of Plastics

ASTM D 882 Standard Test Method for Tensile Properties of Plastics

ASTM D 1693 Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

ASTM D 1603 Test Method for Carbon Black in Olefin Plastics

ASTM D 2122 Test Method for Determining Dimensions of Thermoplastic Pipes & Fittings

### Long Term Performance Requirements

The above specification require COD ducts and its accessories be

1- capable of withstanding the typical service conditions of the Kingdom of Saudi Arabia for a minimum period of fifty (50) years without detriment to the operation and maintenance of the product.

2- Designed, manufactured and packaged so that its physical or operation and maintenance characteristics shall not degrade when exposed to the environmental conditions of Saudi Arabia, and the expected environmental conditions during storage and transportation outside of the Kingdom.(The environmental conditions of Saudi Arabia may include ambient air temperature variations from -10° to +50°C.

#### **Technical Requirements**

COD should be compatible with the latest installation standards and operation and maintenance practices for the telecommunication's duct system.

COD should be free of blisters, shrinkholes and inhomogeneities, that might impair the service performance. COD should to be acceptably round. Supplied with its ends cut cleanly at right angles to the axis of the duct. COD deemed to have accessories easily connectable, e.g., connector, for connecting the duct to manholes/handholes; and joint closure, for enclosing COD joints.

# **ADVANTAGES OF COD**

### Better Flexibility

Due to the spiral formation of the product, COD bends easily without special bending efforts, and is easy to by-pass or over pass hurdles along with the duct line.

#### Lengthy pipe

The lengthy and coiled-on drum reduces considerable labor cost as well working period of installation by waving numerous connections in between two manholes in a one-time installation. On top of this, COD never requires inserting of sub duct into corrugated outer duct owing to the built-in production of multiple sub ducts.

#### Lighter in weight

Compared to the conventional duct, COD is considerably lighter which offers benefit while transporting and handling in the work site.

#### Stronger

The readily built-in multiples numbers of sub ducts perfectly eliminates any loose space inside of spiral corrugated duct, allowing COD to offer considerable advantage in terms of compressive load.

# ADVANTAGES OF COD

Safety

COD stands safe in Earthquakes and Land Subsidence owing to its strong compressive load and flexibility.

#### Easy insertion of optic fiber cables

COD facilitates easy insertion of cables up to the maximum-coiled length owing to perfect alignment of inner ducts and less friction, as it has no connections. In addition, it enables to extend the manhole distance.

#### **High Reliability**

COD is non-conductive of electricity and therefore, it is ideal to apply for power cable ducts.

#### **Cost Efficiency**

COD offers cost efficiency throughout all consecutive work stages and endurances.

#### Better resistance against chemicals

COD lasts semi-permanently, having resistance against chemicals and corrosion from salt water or wetland.

#### The HDPE-COD shall comply with the test requirements of Table 2.

Clause	Properties	Values	Test Method
1.	Compound Density @ 25°C	0.95 g/cm³, min	ASTM D 1505
2.	Pipe Stiffness @ 5% Deflection, average:		
	– HDPE-CD (with 7-29 mm OD sub-ducts)	> 27 kgf/cm <sup>2</sup>	
	– HDPE-CD (with 5-33 mm OD sub-ducts)	27 kgf/cm <sup>2</sup>	
	– HDPE-CD (with 3-42 mm OD sub-ducts)	21 kgf/cm <sup>2</sup>	
	<ul> <li>HDPE-CD 110 mm OD (Empty main duct)</li> </ul>	15 kgf/cm <sup>2</sup>	ASTIVI D 2412
	<ul> <li>HDPE-CD (with 3-27 mm Outside Dia. sub-ducts)</li> </ul>	27 kgf/cm <sup>2</sup>	
	<ul> <li>HDPE-CD 77 mm OD (Empty main duct)</li> </ul>	24 kgf/cm <sup>2</sup>	
3.	Compressive Strength @ 5% Deflection, average:		
	– HDPE-CD (with 7-29 mm OD sub-ducts)	> 1,200 kgf/m	
	– HDPE-CD (with 5-33 mm OD sub-ducts)	1,200 kgf/m	
	– HDPE-CD (with 3-42 mm OD sub-ducts)	950 kgf/m	
	<ul> <li>HDPE-CD 110 mm OD (Empty main duct)</li> </ul>	660 kgf/m	A31101 D 2412
	– HDPE-CD (with 3-27 mm OD sub-duct)	770 kgf/m	
	– HDPE-CD 77 mm OD (Empty main duct)	668 kgf/m	
4.	Tensile Strength @ Yield (film properties)	30 MPa	ASTM D 882
5.	Elongation @ Break (film properties)	400%	ASTM D 882
6.	Carbon Black Content (for black color)	2% minimum	ASTM D 1603
7.	Water Absorption	0.03% maximum	ASTM D 570 24 hrs immersion
8.	Voltage Resistance	2,000 Vac, >15 min	
9.	Insulation Resistance	> 200 Mohm	

# **COMPARISON BETWEEN CONVENTIONAL PRODUCT & COD**

Description	Conventional system		New system		
Description	PVC & FC duct	PE duct	COD		
	S				
	①PVC				
Material	②Foamed polyvinyl chloride	High Density polyethylene	High Density polyethylene		
	①Duct made of PVC	①One piece duct made of polyethylene	①Corrugated concavo-convex shape.		
Shape	②PVC + foamed vinyl chloride + PVC duct	②Flat surface of inside and outside duct	②Multiple sub ducts are readily built-in		
	③Flat surface of inside and outside duct		③The inside of sub duct is protruded connecting		
Connection	in every 6 meters	none	none		
Length	6m (At Maximum)	No Limit	Up to 500 to 1000m		
Weight	medium	light	light		
Insertion of Inner Duct	Insert	Insert	No Need		
Excavation Depth	100%	60%	60%		
Working condition	medium	medium	fine		
Flexibility	medium	fine	fine		
Coefficient of friction	high	medium	low		
Tension	high	high	low		
Strength	weak	strong	strong		
Use of inner space	-	low	high		
Torsion of the inner duct	-	occur	free from torsion		
Breakage	-	may occur	free from crash		
Damage Rate	Over 90%	0 %	0%		



# COD INSTALLATION

# **Striping Outer duct**



Set the two ends of the ducts to be jointed. Mark each end of the duct to13 cm from duct end.



Put the cutter into the outer duct



Pill off the skin of COD spinning right



Cutting Skin of COD and remove COD cutter spinning left



Trimming Sub-duct and complete



To clamp and secure both ends of the COD ducts.



Insert Couplings in each sub duct clamped beside the tool's lever arm.



Operate the lever arm of the Jointing Tool to move the duct towards the opposite duct.



Guide the Sub duct Couplings until they mate with the opposite sub-ducts.



To close and cover the joint. One part below the joint, covering 2 grooves of the duct and the other part to mate with the other half.





Tighten the bolts of the closure. The completed PECD jointing is as shown.

# COD MANHOLE CONNECTORS TYPE I:





COD Manhole connector M,L Body: PE-Cap: PP(PP 90% + PE 10%) - Fixing cover:(PP 90%+PE 10%) -Rubber gasket



Remove outer layer: use the outer layer remover to remove about 50cm of outer laver.



Insert Body of Manhole Connector, Place the Body in the correct position.



use bolts and nuts to connect the body with the upper and lower fixing covers



Complete The Installation

# **COD MANHOLE CONNECTORS TYPE II:**



COD Connector connected to COD duct, and for connection to the PVC Coupling.

Jointing COD to Manhole:



Pull the COD duct up to the manhole or hand-hole wall.



Use COD CONNECTOR to connect COD duct into MH or HH entry hole. Apply duct solvent cement



Insert the COD duct into the MH or HH entry hole.



7



# COD CONNECTOR TYPE III FOR EMPTY DUCT



### COD CORRUGATED COUPLING

Designed to fit 116mm OD COD

COD Corrugated	Dimension ( mm )				
Coupling	Inside Dia. Wall Thickness		А	В	
For 110 mm COD	94	2.5 +/-0.5	116	250	





Use COD CORRUGATED COUPLING, for jointing the two ducts. Screw the full length of the Coupling into one end of COD



# SEALING OF INSTALLED COD DUCT



Insert the COD into the MH or HH entry hole. The sub-ducts shall protrude outside the hole by approx. 20 cm.



Prepare the Plugging Compound and inject between the foam barriers.



First, insert foams around the spaces at one end of the duct terminator.



Insert foams near the hole's opening.



**Completed Installations** 



# COD ACCESSORIES

## **COD Cutter:**



# **COD Connecting Jig:**



# **COD Cutter:**

Material of COD Cutter

- Flange Adapter : ABS
- Steel ring/Handle/Fixing plate/Blade 90 degree
  Steel
- Bolt, Nut and Washer : Steel or SUS

# **COD Cutter:**

Material of COD Connecting Jig

Steel ring/Handle/Fixing plate/Locking Mechanism

### **Minor tools**



A set of minor tools installation of COD

# **COD Connectors**



### **COD End Caps**



### Sub-duct End-cap





# **COD ACCESSORIES**

# **Sub-Duct Coupling:**



Sub - Duct coupling equipped with rubber "O" rings



÷

D

Sub-Duct Coupling		Dimension ( mm )			
Туре	А	В	С	D	
Sub-Duct Coupling , for 29 mm OD sub-ducts, Type 1	39	31	4 +/- 0.5	170	
Sub-Duct Coupling , for 33 mm OD sub-ducts, Type 2	43	35	4 +/- 0.5	170	
Sub-Duct Coupling , for 42 mm OD sub-ducts, Type 3	52	44	4 +/- 0.5	170	
Sub-Duct Coupling , for 27.2 mm OD sub-ducts, Type 4	37.2	29.2	4 +/- 0.5	170	



Sub-Duct Coupling after Connection













# SSD (SILICONE SUB DUCT) - Protecting fiber optical cable

NEPROPLAST SSD is made from virgin, flexible HDPE and is used for Optic Fiber and copper cable networks. It can easily be swept to make gradual bends without special forming equipment.. It has Superior resistance to natural or mechanical damage. The inner wall of the duct is with silicone coated.

Silicone coated internal wall is a solid slick lubricant insulator. Silicone Sub Duct has 80% reduction of co-efficient of friction than non-silicone coated internal ducts, and provides complete cable protection before, during and after installation.

### Advantages:

22

25

29

35

Silicone lasts as long as the Duct itself

Silicone does not evaporate or burn out due to heat or friction

Silicone does not dry by high volume of air nor reduce its efficiency

Silicone is preferred by all Network Builders of the world and is the Industry standard for duct lubrication Silicone co-efficient of friction does not change with time

Silicone supports blowing and pulling







### Long Term Performance Requirements

	Test Name	Performar	nce		Related Materials
	Tensile strength	180kgf/cm2			KS M 3006
	Coefficient of friction	0.30 Below		Bellcore Spec	
		Division	5% strain (kgf or higher)	Inner contact (kgf or higher)	
		22mm	4	33	KS M 3413
Mechanical	Compressive strength (flat)	25mm	7	50	
Properties		29mm	10	100	
		35mm	14	130	
	Compression resilience	Recovery rate more than 10.0%			KS C 8454
	Heat deformation	Strain 3.0%			KS M 3408
	impact	Balance shall be free from cracks		KS C 8454	
		HCL aqueous solution: change in weight 12g/m <sup>2</sup>			KS M 3407
Chemical Properties	Chemical resistance	NaOH aqueous solution: change in weight 12g/m <sup>2</sup>			
		Polyethyle			
		Should be no change in the surface of the sample and Delamination.			

# SSD (SILICONE SUB DUCT) - Protecting fiber optical cable

### Sub-duct wall design

Outer and inner walls shall be plain and smooth. Inner wall shall have low coefficient of friction to facilitate cable installation by blowing technique.

Fusion of main duct and Subducts

All contact surfaces between main duct and built-in subducts shall fuse together during extrusion process. This fusion shall prevent movement or twisting of sub-ducts inside the main COD (in finished products).

### Color of Sub-ducts:

Sub Duct shall have the same color as that of the main duct, except that one sub-duct should always have a distinct color separate from the other. So, if one sub-duct is black the remaining shall be orange. Likewise, if one sub-duct is orange the remaining shall be black.











# HDPE SUB-DUCT AND MINI DUCT

For Telecommunication Networks

NEPROPLAST HDPE Sub - Duct meets the requirements of Telecommunication industry as housing of small diameter fiber optical cables. Upto 4 Sub-Ducts of size. 1" are normally installed in 110mm/4" main duct. Sub-Ducts are available with optional pre-installed rope to facilitate hauling of fiber optic cables. HDPE pipes are normally manufactured in black color, other color is available upon request. HDPE pipes size from 20 mm upon 110 mm are available in coils, alternatively larger size are available in any length.

### MATERIAL

HDPE Ducts are manufactured from piping grade compound fully meeting the material requirements of DIN 8075, also meets the requirements of ASTM D 3350 for class PE 345444C/E designated as PE 3408.

### STANDARDS

HDPE Sub-Duct manufacturing is in accordance to

1) German Standard DIN 8074 and 8075 conforming to the STC material specification. TC 4111

2) American Standard ASTM D3035 / ASTM F2160

Nominal Duct Size	Nominal Out Diameter	Nominal Wall Thickness	Nominal Weight
mm	mm	mm	kg/m
32	32	3.0	0.279
40	40	3.7	0.430
50	50	4.6	0.666

### Table 14: Dimensions based on DIN 8074 SDR 11

### Table 15: Dimensions based on STC.TS 4111 and DIN 8074

Duct Type	Nominal Out Diameter	Nominal Wall Thickness	Nominal ID	SDR
	mm	mm	mm	
Main Duct	110	5.0	100	22
	75	3.4	68.2	22
Mini Duct	50	3.0	44	17
	40	2.4	35.2	17
	32	1.9	28.2	17
Micro Duct	20	1.8	16.4	13.6
	14	1.5	11	9

### Table 16: Dimensions based on ASTM D3035 F2160 SDR 11

Nominal Duct Size	Nominal Out Diameter	Nominal Wall Thickness	Nominal Weight
inch	mm	mm	kg/m
1	33.40	3.05	0.299
1 1/4	42.16	3.84	0.465
1 1/2	48.26	4.39	0.610
2	60.33	4.49	0.952



# Material Properties

NEPROPLAST HDPE ducts are made from high density polyethylene compound fully meeting the material requirements of DIN8075. Also meets the requirements of ASTM D3350 for Class:345444 C/E

NEPROPLAST HDPE ducts shall meet all the material properties and test requirements as specified in ASTM F2160 with customized sizes and dimensions to metric measurements (DIN 8074) and inch measurements (ASTM D3035 and F2160 SDR11)

All values at 23°C unless specified otherwise.

Properties	Requirements	Test Method
Density (compound)	0.941 to 0.955 g/cc, >0.955 g/cc (Cell 3 or 4 as per ASTM D3350)	ASTM D 792
Melt Flow index at 190°C/2.16 Kg	< 0.15 g/10 min	ASTM D 1238 E
Flexural Modulus	552 - < 1103 Mpa	ASTM D 790
Tensile Strength	21 - < Mpa	ASTM D 638
Slow Crack Growth Resistance (10% Igepal)	F20 > 600 Hours ESCR per ASTM D 1693 condition C; or > 10 hours per ASTM F 1473 PENT	ASTM D 1693; ASTM F 1473
Color and UV Resistance	C-Black with 2% min. Carbon Black. E-Colored with UV Stablizer Note that Carbon Black content, 2.25 +0.25% as per ASTM D1603	ASTM D 3350
Physical Properties		
Induction temp (DSC)	220°C	ASTM D 3350
Poisson Ratio	0.45	-
Izod Impact (Notch)	> 2.5 ft. lb/in	ASTM D 256
Co - efficient of friction	=0.15</td <td>Telcordia GR-356</td>	Telcordia GR-356
Ovality (Prior to building or coiling)	< 5%	ASTM D 2160
Mechanical Properties		
Tensile Strength (Break) (50 mm/min)	38 MPa	ASTM D 638
Tensile Strength (Yield) (50 mm/min)	25 MPa	ASTM D 638
Elongation at Break (ultimate)	> 600%	ASTM D 638
Hardness	> 60 Shore "D"	ASTM D 2240
Thermal Properties		
Brittle Temperature	< -100°C	ASTM D 746
Vicat Softening Temp	127°C	ASTM D 1525
Co-efficient of linear thermal expansion	0.2 mm/m°C	ASTM D 696
Specific Heat	2.7 - 2.9 kj/kg°k	Calorimetric
Thermal Conductivity	0.38 W/m. °C	DIN 52612
Chemical Properties		
Chemical Resistance	Resistance to hydrous solution of acids, alkalis and salts as well as to a large number of organic solvents	DIN 8075 Supplement 1 ISO/TR 10358

# Product Data Sheet: PEC - COD 50 mm. Empty HDPE Duct



# DIMENSIONAL REQUIREMENTS

#### **Specifications**

	Description	Max.	Min.
Outer Diameter	50 mm	49.0 mm	48.0 mm
Inside Diameter		37.0 mm	35.0 mm
Wall Thickness		1.90 mm	1.40 mm
Corrugated Depth		8.00 mm	7.00 mm
(O.D. to I.D.)			

#### Product Weight 0.300 kg/meter

# **QUALITY REQUIREMENTS**

#### Appearance

Product shall be free from surface defects that will impair product characteristics, diminish its function or result to customer rejection.

#### Marking on Outer Duct (1.0 meter interval)

HDPE PEC - DUCT 50 mm (Arabic logo) (Arabic Origin) NEPROPLAST Jeddah, K.S.A. (date) (shift no.) (time)

Note: Marking can be as per customer requirements.

#### Test

Flattening Test (50% of Outside Diameter)

#### **Material Class**

Color:

Material: HDPE

435500 as defined in ASTM D3350 standard

Orange for Outer Duct 50 mm Orange for 4 Inner Ducts (14 mm)

Black for 1 Inner Duct (14mm)

# Product Data Sheet: Micro PEC - COD 5 Lines, 50mm O.D. HDPE





### **DIMENSIONAL REQUIREMENTS**

#### **Specifications**

For Outer Duct	(mm)	For Inner Duct	(mm)
Outer Diameter	48.5 ± 0.5	Outer Diameter	14.0 ± 0.5
Inside Diameter	36.0 ± 1.0	Inside Diameter	11.5 ± 0.5
Wall Thickness	1.35 ± 0.15	Wall Thickness	1.25 ± 0.25
-	-	Ovality	5% max.

#### Ovality % = <u>Maximum O.D. – Minimum O.D.</u> X 200% Maximum O.D. + Minimum O.D.

#### **Product Weight**

**Total Weight** (Outer Duct and 5 Inner Ducts = **0.5360 kg./1.0 meter** each with Silicon Insulation)

 Component Weights
 Weight of Outer Duct Only
 = 0.3000 kg/ 1.0 meter

 Weight of Individual Inner Duct
 = 0.0472 kg/ 1.0 meter
 = 0.236 kg/ 1.0 meter

# **QUALITY REQUIREMENTS**

#### **Appearance**

Product shall be free from surface defects that will impair product characteristics, diminish its function or result to customer rejection.

#### Tests

#### **Oven Test for Inner Duct Only**

Acceptance Criteria	: Maximum 3.0% change in length
	: No blistering and scaling

Flattening Tests for PEC - COD with Inner Ducts

Acceptance Criteria : No crack at 50% flattening

#### Marking on Outer Duct (1.0 meter interval)

NEPROPLAST MICRO PEC - COD 50mm O.D. with 5 built-in SUB-DUCT O.D. 14mm (Arabic logo) (Arabic origin) Jeddah K.S.A. (date) (shift no.) (time) (line no.) .....xxx M. (sequential)

Note: Marking can be as per customer requirement.



www.namat.com



Color:

Orange for Outer Duct 50 mm Orange for 3 Inner Ducts (15 mm) Black for 1 Inner Duct (15mm)

Material: HDPE

# DIMENSIONAL REQUIREMENTS

#### **Specifications**

For Outer Duct	(mm)	For Inner Duct	(mm)
Outer Diameter	48.5 ± 0.5	Outer Diameter	15.0 ± 0.5
Inside Diameter	36.0 ± 1.0	Inside Diameter	12.5 ± 0.5
Wall Thickness	1.35 ± 0.15	Wall Thickness	1.25 ± 0.25
-	-	Ovality	5% max.

#### Ovality % = <u>Maximum O.D. – Minimum O.D.</u> X 200% Maximum O.D. + Minimum O.D.

#### **Product Weight**

**Total Weight** (Outer Duct and 5 Inner Ducts = **0.5036 kg./1.0 meter** each with Silicon Insulation)

 Component Weights
 Weight of Outer Duct Only
 = 0.3000 kg/ 1.0 meter

 Weight of Individual Inner Duct
 = 0.0509 kg/ 1.0 meter

 Total Weight of 4 Inner Ducts w/silicon insulation
 = 0.2036 kg/ 1.0 meter

# **QUALITY REQUIREMENTS**

#### Appearance

Product shall be free from surface defects that will impair product characteristics, diminish its function or result to customer rejection.

#### Tests

#### **Oven Test for Inner Duct Only**

Acceptance Criteria : Maximum 3.0% change in length : No blistering and scaling Flattening Tests for PEC - COD with Inner Ducts

Assessment of the second second

Acceptance Criteria : No crack at 50% flattening

#### Marking on Outer Duct (1.0 meter interval)

NEPROPLAST MICRO PEC - COD 50mm O.D. with 4 built-in SUB-DUCT O.D. 15mm (Arabic logo) (Arabic origin) Jeddah K.S.A. (date) (shift no.) (time) (line no.) .....xxx M. (sequential) Note: Marking can be as per customer requirements.

# Product Data Sheet: Micro PEC - COD 3 Lines, 50mm O.D. HDPE



#### Color:

Orange for Outer Duct 50 mm Orange for 3 Inner Ducts (16 mm) Black for 1 Inner Duct (16 mm)

Material: HDPE

# **DIMENSIONAL REQUIREMENTS**

#### **Specifications**

For Outer Duct	(mm)	For Inner Duct	(mm)
Outer Diameter	$48.5 \pm 0.5$	Outer Diameter	16.0 ± 0.5
Inside Diameter	36.0 ± 1.0	Inside Diameter	13.5 ± 0.5
Wall Thickness	1.35 ± 0.15	Wall Thickness	1.25 ± 0.25
-	-	Ovality	5% max.

#### Ovality % = <u>Maximum O.D. – Minimum O.D.</u> X 200% Maximum O.D. + Minimum O.D.

# **Product Weight**

**Total Weight** (Outer Duct and 5 Inner Ducts = **0.4707 kg./1.0 meter** each with Silicon Insulation)

 Component Weights
 Weight of Outer Duct Only
 = 0.3000 kg/ 1.0 meter

 Weight of Individual Inner Duct
 = 0.0569 kg/ 1.0 meter

 Total Weight of 3 Inner Ducts w/silicon insulation
 = 0.1707 kg/ 1.0 meter

# **QUALITY REQUIREMENTS**

#### **Appearance**

Product shall be free from surface defects that will impair product characteristics, diminish its function or result to customer rejection.

#### **Tests**

#### **Oven Test for Inner Duct Only**

Acceptance Criteria	: Maximum 3.0% change in length
	: No blistering and scaling

Flattening Tests for PEC - COD with Inner Ducts

Acceptance Criteria : No crack at 50% flattening

#### Marking on Outer Duct (1.0 meter interval)

NEPROPLAST MICRO PEC - COD 50mm O.D. with 4 built-in SUB-DUCT O.D. 16mm (Arabic logo) (Arabic origin) Jeddah K.S.A. (date) (shift no.) (time) (line no.) .....xxx M. (sequential)

Note: Marking can be as per customer requirements.

# NEPROPLAST

Manufacturing Plant, JEDDAH P.O. Box 460 - Zip Code 21411 Tel: 02-6363558 / 1596 / 1205 Fax:02-6362364 Email: info@neproplast.com

# MARKETING OFFICES

# Western Region

#### Jeddah

National Marketing Est Co. Ltd P.O. Box 16375, Zip Code 21464 Tel : 02 227 4515/6716/2912 Fax : 02 227 1796 Email: cont@namat.com

### Taif

National Marketing Est Co. Ltd King Khaled Street Tel : 02 744 1345 Fax : 02 744 1645 Email: nader.grenawi@ikkgroup.com

#### Madina

National Marketing Est Co. Ltd P.O. Box 5362, Al Jamat Road Tel : 04 850 0011 / 1010 / 0505 Fax : 04 850 0165 Email: madinah@namat.com

### Yanbu

National Marketing Est Co. Ltd P.O. Box 773, Zip Code 41911 Tel: 04 3223880/3917483/3900505 Fax : 04 322 3857 Email: yanbu@namat.com

#### Tabuk

National Marketing Est Co. Ltd Al Munawarah Road Tel: 04 423 0550 / 2502 Fax : 04 421 5761 Email: tabuk@namat.com

#### Jezan

National Marketing Est Co. Ltd Sabia city, Darir Baney Malk St Tel : 07 327 0072 Fax : 07 326 7577 Email: saher.almossa@ikkgroup.com

#### Sabt Al Alaya

National Marketing Est Co. Ltd Near Al Farouk Mosque, Tel : 07 630 0701 Fax : 07 630 0705 Email: waheeb.trad@ikkgroup .com

#### **Khamis Mushait**

National Marketing Est Co. Ltd P.O. Box : 2819, New Khamis Mushait Industrial Area, Tel : 07 233 0997 / 238 2977 / 2887 Fax : 07 233 0660 Email: khamis@ikkgroup .com

# **Central Region**

Riyadh

National Marketing Est Co. Ltd P.O. Box 60738, Zip Code 11555 Tel : 01 478 0015 / 477 3378 Fax : 01 478 2567 Email: riyadh@namat.com

#### Al Kharj

National Marketing Est Co. Ltd P.O. Box 2589, Zip Code 11942 Tel : 01 548 9057 Fax : 01 548 4773 Email: kharj@namat.com

#### Qassim

National Marketing Est Co. Ltd P.O. Box 2218, Buraidah Tel : 06 382 0916 / 381 3350 Fax : 06 381 3982 Email: gassim@namat.com

#### Hail

National Marketing Est Co. Ltd P.O. Box 7479, Hail Tel : 06 533 0476 Fax : 06 534 4248 Email: hail@namat.com

#### Arar

National Marketing Est Co. Ltd P.O. Box 1251, Zip Code 91431 Tel : 04 664 2529 Fax : 04 662 1626 Email: arar@namat.com

#### Wadi Dawasser

National Marketing Est Co. Ltd P.O. Box 2589, Zip Code 11942 Tel : 01 786 1029 Fax : 01 786 1029 Email: kharj@namat.com

#### Qurrayat

National Marketing Est Co. Ltd P.O. Box 1251, Zip Code 91431 Tel : 04 642 7779 Fax : 04 641 6233 Email: arar@namat.com

# Eastern Region

#### Dammam

National Marketing Est Co. Ltd P.O. Box 2145, Zip Code 31952 Tel : 03 847 1315 Fax : 03 847 1312 Email: dammam@namat.com

#### Saud Branch

National Marketing Est Co. Ltd P.O. Box 2145, Zip Code 31952 Tel : 03 834-4904 Fax : 03 834-5247 Email: dammam@namat.com

#### Al Ahsa

National Marketing Est Co. Ltd P.O. Box 4251, Zip Code 31982 Tel : 03 580 0699 Fax : 03 588 5681 Email: alahsa@namat.com

#### Jubail

National Marketing Est Co. Ltd P.O. Box 810, Zip Code 31951 Tel : 03 361 2159 Fax : 03 361 2155 Email: jubail@namat.com

#### Hafr Btain

National Marketing Est Co. Ltd Hafr Btain, Zip Code 31991 Tel : 03 723 5200 Fax : 03 723 5240 Email: hafralbaten@namat.com

#### Khafji

National Marketing Est Co. Ltd P.O. Box 810, Zip Code 31951 Tel : 03 767 0557 Fax : 03 767 1146 Email: khafji@namat.com

# **Export Offices**

National Marketing Est Co. Ltd P.O. Box 16375, Zip Code 21464 Tel : 02 647 4204 Fax : 02 647 4503 Email: export@namat.com





شركة صناعات المنتوجات الجديده المحدودة

# انابيب نيبروبلاست المموجة من البولي اثيلين للقنوات البصرية الرئيسية و الفرعية



شركة المؤسسة الوطينة للتسويق المحدودة