

SAPPCO DAMMAM FACTORY
Branch of Saudi Plastic Products Co. Ltd.
C.R. 2050050912

مصنع سابكو والدمام
فرع شركة منتجات البلاستيك السعودية المحدودة
س.ت. ٢٠٥٠٠٥٠٩١٢

THE
PE PIPE

WITH PRE-INSTALLED **PULL ROPE**



SAPPCO DAMMAM

SUB

DUCT

FOR FIBER OPTIC CABLE
INSTALLATION



ISO 9001:2008



Publication P. 9 Issue 9
April 2015

INTRODUCTION

The Kingdom of Saudi Arabia uses the latest and well proven technology for the development of industrial, Commercial and all types of public service projects.

In line with this prudent practice the Telecommunication Industry has adopted the use of fibre optic cables.

For the installation of fiber optic cables the Ministry of P.T.T. (MOPTT), Saudi Telecom and SEC have specified the use of long term performance Sub-Duct and Mini Duct made from latest generation of High Density Polyethylene (HDPE) piping compounds.

To fulfill this need SAPPCO DAMMAM FACTORY has designed and manufacture HDPE Sub-Duct and Mini Duct so that exposure to the environmental conditions of Saudi Arabia during storage, transport, installation and operation shall not degrade the physical or operation and maintenance characteristics of the Sub-Duct and Mini Duct.

Our Sub-Duct and Mini Duct are manufactured from the specifically designed ready-made black pipe higher strength grade compound in which the carbon black has been perfectly dispersed to give the maximum possible protection from sunlight and heat.

The experience of our Technical Department is freely available for advice and assistance when needed, on use of pipe products.

APPLICATION SUB-DUCT/MINI DUCT

This is a Technical Catalogue of SAPPCO DAMMAM FACTORY manufactured HDPE Sub-Duct and Mini Duct to meet the needs of Telecommunication Industry in Saudi Arabia and the other Gulf States.

High Density Polyethylene (HDPE) Sub-Duct and Mini duct are used in Telecommunication for security and convenience when hauling in small diameter fiber optic cables.

The Sub-Duct is also available with a Pre-installed rope to facilitate, the pulling of Fiber Optic Cables through it.

Four Sub-Ducts of small diameter may be installed in HDPE or PVC duct or single Sub-Duct may be installed over existing cables in ducts to protect the fiber optic cables during hauling in.

Mini Duct is also available with longitudinal grooves (Ribbed) on its inner surface or with smooth bore.

Mini Duct is used for direct buried application to protect cables.

MATERIAL CLASSIFICATION

| STANDARD | DESCRIPTION | DESIGNATION |
|-----------------------|---------------------------|-----------------------|
| EN ISO 12162/DIN 8075 | Minimum Required Strength | PE 100 / MRS 10.0 MPa |
| ASTM D 3350 | Cell Classification | 345440 CIE |
| ASTM D 2837/PP1 | Material Designation | PE 4710/3608 |

MANUFACTURING STANDARDS

| | |
|----------------|--|
| DIN 8074 | Polyethylene Pipes - PE 80, PE 100 - Dimensions |
| DIN 8075 | Polyethylene Pipes - General quality requirements, testing |
| STC TS 4111 | Technical Specification for Ducts, HDPE Main, Mini & Micro-Ducts |
| SEC 23-SDMS-01 | Material Specification for Duct, HDPE Main, Mini & Micro - Ducts |
| MOPTT MAT 2301 | Ministry of PTT Specification HDPE Sub-duct and Mini-duct |
| ASTM F 2061 | Solid wall HDPE conduit Based on Controlled outside Diameter |
| ASTM D 3035 | PE Plastic Pipe (DR-PR) Based on Controlled outside Diameter |

QUALITY MANAGEMENT SYSTEM



ISO 9001:2008

SAPPCO operates an upgraded Quality Management System in accordance with Quality Standard EN ISO 9001:2008 and has been successfully **ASSESSED** and **CERTIFIED** in this respect by **TUV NORD CERT** of Germany.

Routine testing is carried out as laid down in relevant manufacturing and testing standards requirements in our well equipped laboratory.

COLOUR

Sub-Duct and Mini Duct are Supplied in different colours as per request of our valued customers.

LENGTH

1. Coils are available in any length up to 600 meters depending on size.
2. Alternatively on sturdy wooden reels available in any length up to 2000 meters.

MATERIAL PROPERTIES

MATERIAL

HIGH DENSITY POLYETHYLENE (HDPE)

All values at 23°C unless otherwise specified

TABLE 1

| Property | Test Method | Unit | Values |
|--|------------------|---------------|------------------------|
| | | | PE 100 |
| Physical Properties | | | |
| Density (Compound) | D 792 | g/cc | 0.961 |
| Carbon black content | D 1603 | % | 2.25 ± 0.25 |
| Melt Index, load 2.16 Kg. | D 1238 E | g/10min | < 0.1 |
| Induction temp. (DSC) | D 3350 | °C | > 220 |
| Poisson's ratio | - | - | 0.45 |
| ESCR | D 1693 | h | > 10000 |
| Izod impact (notch) | D 256 | ft.lb/in | > 2.5 |
| Co-efficient of friction | Hazen William | Factor "C" | 150 |
| | Colebrook white | Factor "K" mm | 0.003 |
| Mechanical Properties | | | |
| Tensile Strength (Break) | D 638 (50mm/min) | MPa | 38 |
| Tensils Strength (Yield) | D 638 (50mm/min) | MPa | 25 |
| Elongation (ultimate) | D 638 (50mm/min) | % | > 600 |
| Modulus of elasticity | D 790 | MPa | 1400 |
| Hardness | D 2240 | Shore "D" | > 60 |
| Electrical Properties | | | |
| Volume Resistivity | DIN 53482 | ohm.cm | >10 ¹⁷ |
| Surface Resistance | DIN 53482 | ohm | >10 ¹⁴ |
| Dielectric Strength | DIN 53481 | kV cm | 2.2 x 10 ² |
| Dielectric Constant | DIN 53483 | Factor | 2.6 |
| Thermal Properties | | | |
| Brittle Temperature | D 746 | °C | <-100 |
| Vicat Softening Temp. | D 1525 | °C | 127 |
| Co-efficient of Linear Thermal Expansion | D 696 | °C | 1.3 x 10 ⁻⁴ |
| Specific Heat | Calorimetric | kJ/kg °K | 2.7 - 2.9 |
| Thermal Conductivity | DIN 52612 | W/m °C | 0.38 |

CHEMICAL RESISTANCE

SAPPCO PE PIPE is unaffected by all kinds of water, soils, corrosive liquids, most common acids and alkalies and all forms of corrosion normally encountered in metallic pipes. Care must be taken when PE pipes are used for oxidizing agents.

SAPPCO HDPE DUCTS
WITH AND WITHOUT
PRE-INSTALLED PULL ROPE INSIDE

TABLE 2 Dimensions Based on MOPTT MAT 2301 and DIN 8074

| Duct Type | Nominal Outside Diameter mm | Nominal Wall Thickness mm | Nominal Weight kg/m |
|-----------|--------------------------------|------------------------------|------------------------|
| Sub-Duct | 32 | 2.0 | 0.196 |
| Mini Duct | 50 | 2.9 | 0.440 |

TABLE 3 Dimensions Based on DIN 8074 SDR 11

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

PE100-50 mm size co-extruded is supplied in black colour with outer layers in blue and orange colours to meet Mobily requirements.

TABLE 4 Dimensions Based on ASTM - F2160 SDR 11 / D3035 SDR 11

| Nominal Duct Size inch | Nominal Outside Diameter mm | Nominal Wall Thickness mm | Nominal Weight 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 | 5.49 | 0.952 |

Sub-duct to ASTM F2160 in other sizes and DR. please consult our sales Technical Department.

TABLE 5 Dimensions Based on SAPPCO SPEC. and DIN 8074

| Longitudinal (Ribbed) Groove Conduit Series | Nominal Outside Diameter mm | Nominal Wall Thickness mm | Nominal Weight kg/m |
|---|--------------------------------|------------------------------|------------------------|
| GC 11 | 50 | 4.0 | 0.557 |
| GC 12 | 50 | 4.6 | 0.680 |

Note: HDPE Ducts to other dimensions are available on request, Please contact our technical sales department for further inquiries.

SAPPCO HDPE SUB-DUCT, MINI DUCT & MAIN DUCT

SEC AND STC SPECIFICATIONS WITH AND WITHOUT PRE-INSTALLED PULL ROPE INSIDE SUB-DUCTS & MINI DUCTS

| TABLE 6 | | Dimensions based on SEC SPECIFICATION 23-SDMS-01 and DIN 8074 | | |
|----------------|--------------------------|--|----------------|-------------|
| HDPE | Nominal Outside Diameter | Nominal Wall Thickness | Nominal Weight | SDR of duct |
| Duct type | mm | mm | kg/m | Class |
| Mini - Ducts | 20 | 1.8 | 0.108 | SDR 13.6 |
| | 32 | 1.9 | 0.189 | SDR 17 |
| | 40 | 2.4 | 0.294 | SDR 17 |
| | 50 | 3.0 | 0.452 | SDR 17 |
| Main Ducts | 75 | 3.5 | 0.806 | SDR 22 |
| | 110 | 5.0 | 1.67 | SDR 22 |

| TABLE 7 | | Dimensions based on STC SPECIFICATION TS 4111 and DIN 8074 | | |
|----------------|--------------------------|---|----------------|-------------|
| HDPE | Nominal Outside Diameter | Nominal Wall Thickness | Nominal Weight | SDR of duct |
| Duct type | mm | mm | kg/m | Class |
| Mini - Ducts | 20 | 1.8 | 0.108 | SDR 13.6 |
| | 32 | 1.9 | 0.189 | SDR 17 |
| | 40 | 2.4 | 0.294 | SDR 17 |
| | 50 | 3.0 | 0.452 | SDR 17 |
| Main Ducts | 75 | 3.4 | 0.806 | SDR 22 |
| | 110 | 5.0 | 1.67 | SDR 22 |

Note(s); 01: Please specify Duct type, outside diameter, wall thickness & SDR, in your inquiry

02: Ducts in Tables 6 & 7 are smooth wall, for longitudinal ribbed wall refer to Table 5

03: Ducts in other dimensions please consult our technical sales for further inquiries

REFERENCES

SAPPCO HDPE Sub-Duct has been used in the following major Telecommunication Projects.

MINISTRY OF P.T.T., SAUDI TELECOM

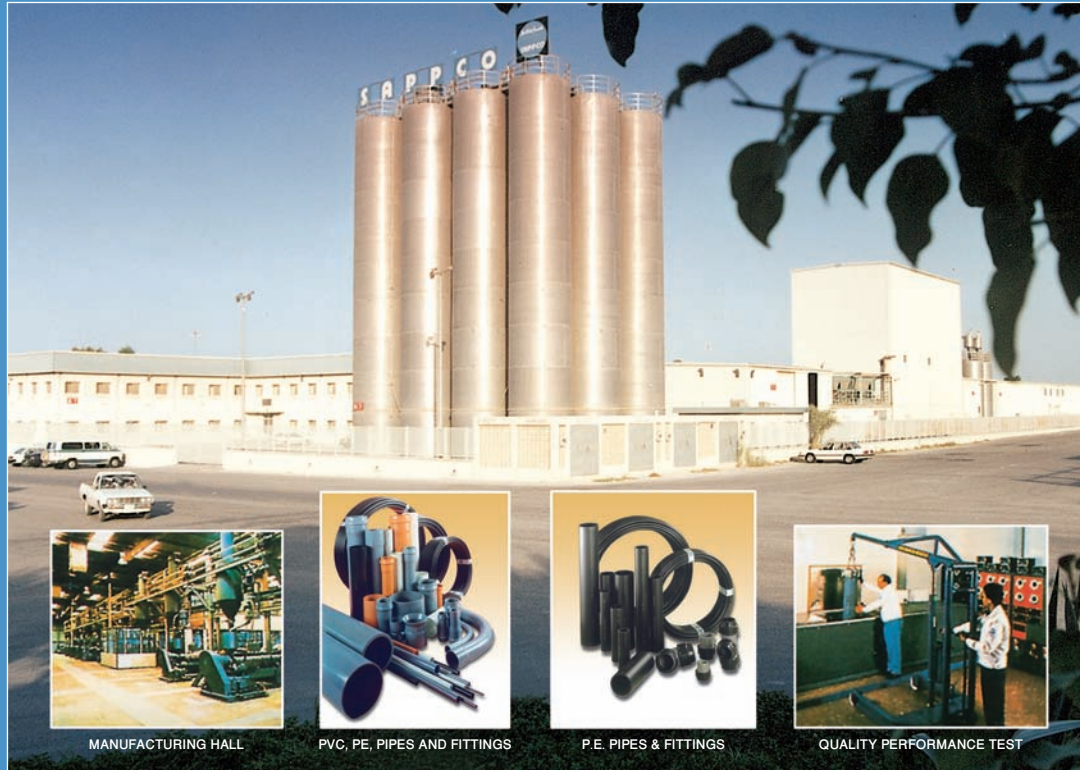
1. King Fahd Causeway to Bahrain
2. Telephone network Dammam Central Telephone Board to King Fahd International Airport (KFIA)
3. Telephone network Dammam to KFIA Abu-Hadriah Road
4. Telephone network Arar - Turaif
5. Telephone network at Yanbu
6. Telephone network at Riyadh
7. Telephone network at Rabigh
8. Telephone network at Makkah
9. Telephone network at Kuwait
10. Telephone network ABV site 1, 5, & 6
11. Cable protection SWCC Al-Khobar
12. Eastern Province Water Transmission System
13. STC Dammam Project
14. SEC-ERB Contract No. 83799/00
15. SEC-ERB, Jubail
16. SCECO East 81720/00
17. SCECO No. 30431083100

SAUDI ARAMCO

1. Telephone network at Hawtah - Contract No. 66000/00
2. Telephone network at Hawtah - Contract No. 44379/00
3. Telephone network at Hawtah Gas plant project
4. Telephone network for contract No. 44379/00
5. Telephone network at Rabigh
6. 5 SDGM wells
7. 4 UTMN JOUF wells
8. 4 HADH replacement well
9. 6041819 - Hawiyah - Inner duct
10. Aramco Power Dist. Support facilities
11. RABIGH JV Project / CBC
12. Microwave replacement & Bank none PHI NEC
13. Haradh increment III - Fiber optic

MOBILY PROJECTS IN DIFFERENTS AREAS OF SAUDI ARABIA

SAPPCO DAMMAM FACTORY A LEADING MANUFACTURER OF CPVC, PVC, LDPE & HDPE PLASTIC PIPES



MANUFACTURING HALL

PVC, PE, PIPES AND FITTINGS

P.E. PIPES & FITTINGS

QUALITY PERFORMANCE TEST

*SAPPCO after sales and service
provides its customers with advice on any
technical problems they may encounter.*

For further details and information, contact

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