Arab Dreams
Company for Industry

# COD

## PIPING SYSTEM

INTERNET
BROADCASTING
SECURITY
ELECTRICAL
TRANSPPORT
INFRASTRUCTURE

ADCO's technical manual for COD pipes

NEOM AMAALA MODON Red Sea Global

www.adcopipes.com

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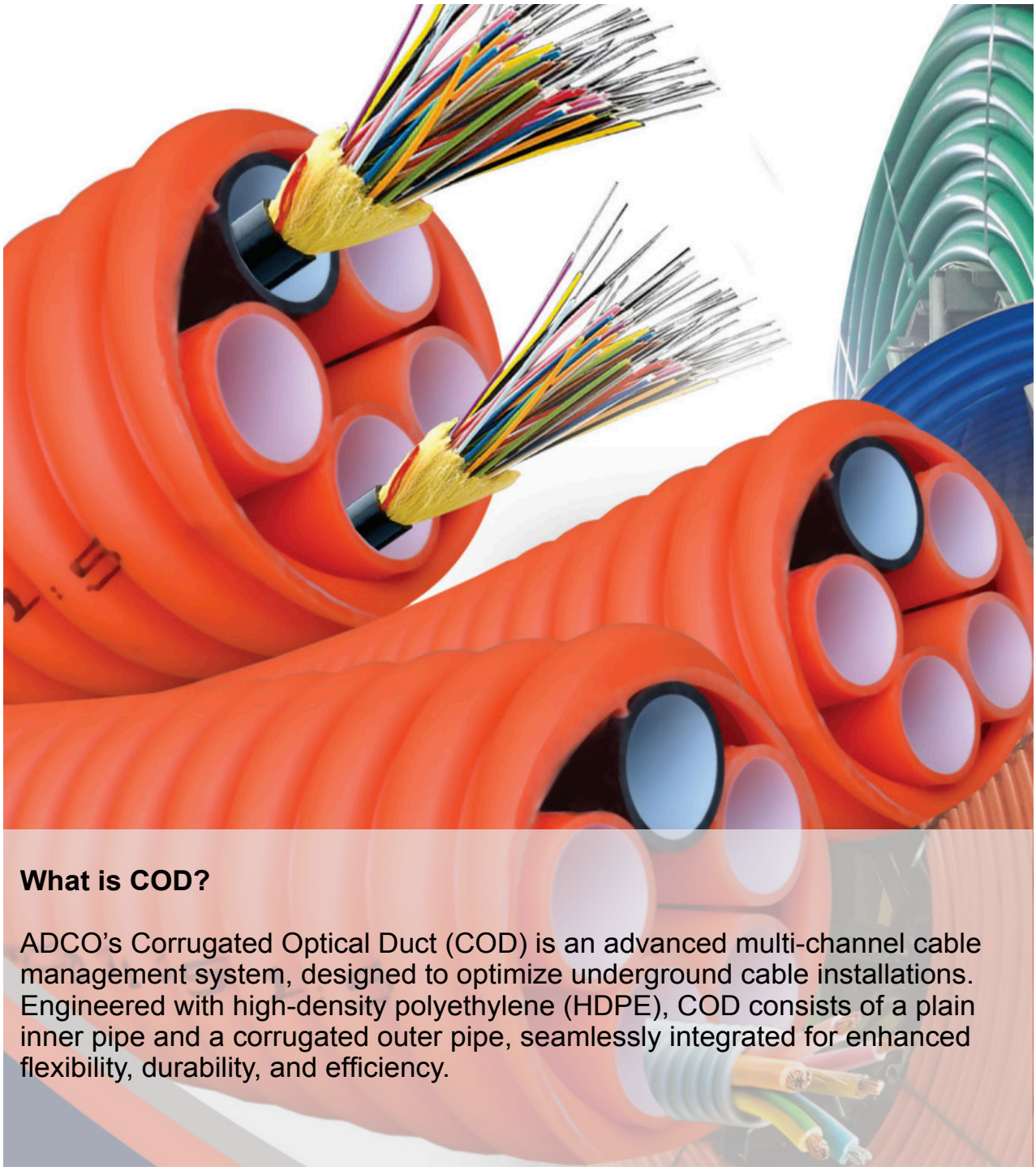
# ADCO Pipes:

## Corrugated Optical Duct (COD)

**Innovative Multi-Channel Ducting Solution**

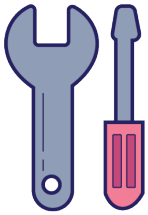


### What is COD?

ADCO's Corrugated Optical Duct (COD) is an advanced multi-channel cable management system, designed to optimize underground cable installations. Engineered with high-density polyethylene (HDPE), COD consists of a plain inner pipe and a corrugated outer pipe, seamlessly integrated for enhanced flexibility, durability, and efficiency.

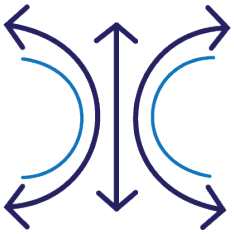
# Why Choose ADCO'S COD?

## Corrugated Optical Duct Features

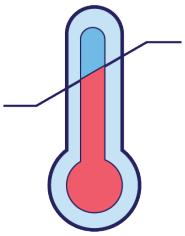


**Versatile Installation**

**High-Quality** HDPE Material



**Extreme Flexibility** Coils of 500m+

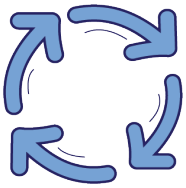


**Operation, storage** and **installation** at temperatures ranging from -20°C to +40°C

**Resistant to Ground Movement** prevents damage from shifts

**Light weight** easier handling compared to conventional ducts

**Low Electrical & Thermal Conductivity**

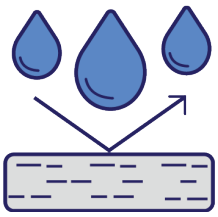


**100% Recyclable & Sustainable**

**UV Resistance** With-stands exposure during storage and installation

**Pull out resistance** during installation

**Water infiltration resis-tance** during storage, installation and operation



**Corrosion free system operation**

# CHARACTERISTICS of

## PE Corrugated Optical Duct (COD)

### Colours

- RAL 2004
- RAL 3024
- RAL 5012
- RAL 6038
- RAL 1021
- RAL 9007
- RAL 8016
- RAL 9010
- RAL 4001

Custom color configurations for micro ducts and corrugated sheaths available upon request.

### Areas of Application

- Internet
- Fiber Optics
- 5G Networks
- Smart Cities
- Undersea Cabling
- Broadcasting
- CCTV
- Video Communication
- Power Distribution
- Highways
- Railways
- Metro Networks
- Industrial Zones

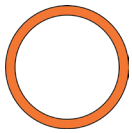
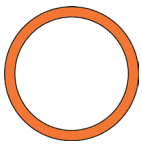
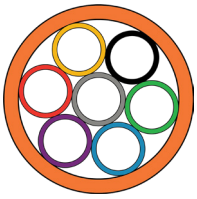
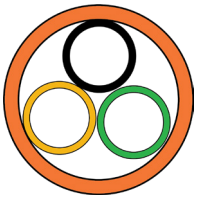
### COD's Cutting-Edge Technology

**Outer Sheath:** HDPE-based corrugated outer structure for superior protection and flexibility.

**Micro Ducts:** HDPE inner silicone-coated surface ensures effortless cable pulling.

# PRODUCT RANGE

ADCO's corrugated optical ducts systems are available in different sizes and configurations.

| Type | Design Configuration | Outer Diameter (OD) mm | Inner Diameter (ID) mm | Wall Thickness |
|---|---|---|---|---|
|  | COD main duct | 77 ± 2 | 58 ± 2 | 2.5 ± 0.5 |
|  | COD main duct | 110 ± 2 | 90 ± 2 | 2.5 ± 0.5 |
| **COD with 7 subducts**  | COD main duct | 110 ± 2 | 90 ± 2 | 2.5 ± 0.5 |
| | sub-ducts | 29 ± 1 | 25 ± 1 | 2.0 ± 0.2 |
| **COD with 5 subducts**  | COD main duct | 110 ± 2 | 90 ± 2 | 2.5 ± 0.5 |
| | sub-ducts | 33 ± 1 | 28 ± 1 | 2.5 ± 0.5 |
| **COD with 3 subducts**  | COD main duct | 77 ± 2 | 58 ± 2 | 2.5 ± 0.5 |
| | sub-ducts | 27.2 ± 1 | 22.2 ± 1 | 2.5 ± 0.5 |
| **COD with 3 subducts**  | COD main duct | 110 ± 2 | 90 ± 2 | 2.5 ± 0.5 |
| | sub-ducts | 42 ± 1 | 36 ± 1 | ± 0.5 |

# TECHNICAL DATA

| S.L. No. | Properties | Values | Test Method |
|---|---|---|---|
| 1 | Compound Density @ 25°C | 0.95 g/cm3, min | ASTM D 1505 |
| 2 | Pipe Stiffness @ 5% Deflection, average: | | ASTM D 2412 |
| | – HDPE-CD (with 7-29 mm OD sub-ducts) | > 27 kgf/cm2 | |
| | – HDPE-CD (with 5-33 mm OD sub-ducts) | 27 kgf/cm2 | |
| | – HDPE-CD (with 3-42 mm OD sub-ducts) | 21 kgf/cm2 | |
| | – HDPE-CD 110 mm OD (Empty main duct) | 15 kgf/cm2 | |
| | – HDPE-CD (with 3-27 mm Outside Dia. sub-ducts) | 27 kgf/cm2 | |
| | – HDPE-CD 77 mm OD (Empty main duct) | 24 kgf/cm2 | |
| 3 | Compressive Strength @ 5% Deflection, average: | | ASTM D 2412 |
| | – 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 | |
| | – HDPE-CD 110 mm OD (Empty main duct) | 660 kgf/m | |
| | – 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 | Nominal Pressure (Sub-duct) | 16 Ba | SASO 15 |
| 7 | Hydrostatic Strength (Sub-duct) | 8 MPa | ASTM D 2837 |
| 8 | Environmental Stress Crack Resistance (ESCR),F20 | 192 h, Condition C | ASTM D 1693 |
| 9 | Carbon Black Content (for black color) | 2% minimum | ASTM D 1603 |
| 10 | Water Absorption | 0.03% maximum | ASTM D 570 24 hrs immersion |
| 11 | Voltage Resistance | 2,000 Vac, >15 min | |
| 12 | Insulation Resistance | > 200 Mohm | |

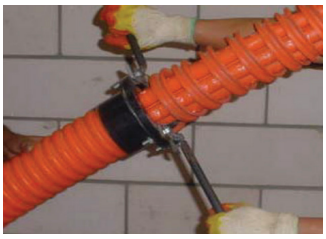
# Why COD is better?

| Description | Conventional system | | New system |
|---|---|---|---|
| | PVC & FC duct | PE duct | COD |
| Material | 1. PVC<br>2. Foamed polyvin chloride | High Density poly-ethylene | High Density polyeth-ylene |
| Shape | • Duct made of PVC<br>• PVC + foamed vinyl chloride + PVC duct<br>• Flat surface of in-side and outside duct | • One piece duct made of poly-ethylene<br>• Flat surface of inside and out-side duct | • Corrugated conca-vo-convex shape.<br>• Multiple sub ducts are readily built-in<br>• The 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 Guide

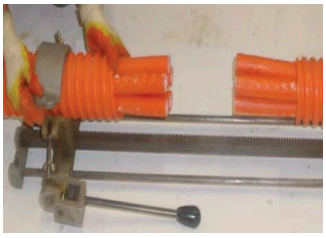
### *1. Stripping Outer Duct*

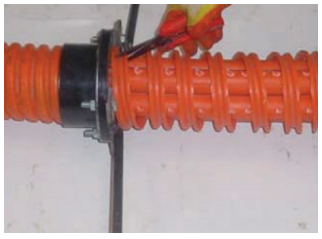
- Set the two ends of the ducts to be jointed. Mark each end 13 cm from the duct end.
- Insert the cutter into the outer duct and peel off the outer skin by spinning the cutter to the right.
- Remove the COD cutter by spinning left.



### *2. Trimming and Securing Sub-Ducts*

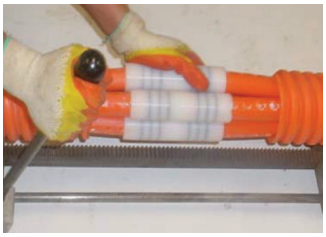
- Trim the sub-ducts and ensure both ends are properly clamped.
- Insert couplings into each sub-duct, ensuring alignment beside the tool's lever arm.
- Operate the lever arm to move the ducts towards each other.
- Guide the sub-duct couplings until they securely mate with the opposite sub-ducts.





### *3. Sealing the Joint*

- Place one part of the closure below the joint, covering two grooves of the duct.
- Mate the other part with the closure and tighten the bolts securely.
- The completed PECD joint is now ready for operation.



# COD Manhole Connectors

## Type I: COD Manhole Connector M, L

- Body: PE
- Cap: PP (90% PP + 10% PE)
- Cover: PP (90% PP + 10% PE)


**Installation Steps:**

1. Remove 50 cm of the outer layer using an outer layer remover.
2. Insert the Manhole Connector Body into position.
3. Secure with bolts and nuts using upper and lower fixing covers.
4. Complete the installation.

## Type II: COD Connector for Manhole or Hand-Hole Entry

1. Pull the COD duct up to the manhole or hand-hole wall.
2. Use a COD Connector to secure the duct into the entry hole.
3. Apply duct solvent cement.
4. Insert the COD duct into the entry hole.

## Type III: COD Corrugated Coupling for Empty Ducts

1. Apply duct cement around the ducts, 15 cm from the ends.
2. Use COD Corrugated Coupling for jointing.
3. Screw the full length of the coupling into one end of COD.
4. Secure after connection.

## Sealing of Installed COD Duct

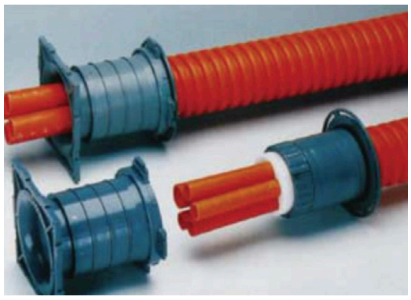
1. Insert COD into the MH/HH entry hole, ensuring sub-ducts protrude 20 cm.
2. Insert foams around gaps near the hole's opening.
3. Prepare the Plugging Compound and inject between foam barriers.
4. Complete installation and seal for maximum protection.

# COD ACCESSORIES

COD Connector

COD Cutter

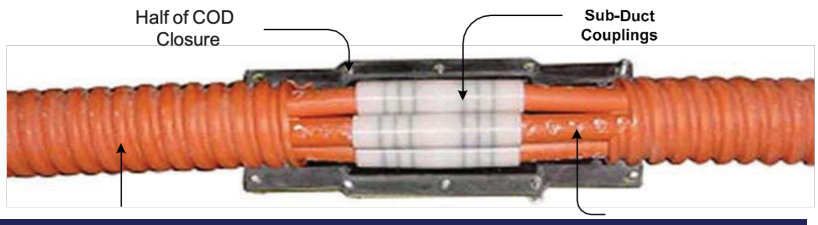
COD connecting jig



Manhole connectors

COD End Caps

Subduct End Caps




Sub-Duct Coupling

| Sub-Duct Coupling | | Dimension ( mm ) | | | |
|---|---|---|---|---|---|
| Type | | OD | ID | Wall Thickness | Length |
| 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 |

# Thank you!

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