MICRO COD
MICRO-SIZED CORRUGATED OPTICAL DUCT

THE EXPERT
COMMUNICATION DUCT
HDPE PIPING SYSTEM

OptiRoad
MAJOR PROJECTS

COD

- Korea Expressway Corp.
- Seoul Construction and Management Administration
- LG U+ Telecom
- Korea Rail Network
- Ministry of National Defense
- Korea Rural Community Corp.
- Korea Water Resource Corp.
- General Dynamics/USA

Micro COD

- Korea Telecom
- LG U+ Telecom
- KEPCO
- Hanaro Telecom
- Onsei Telecom
- SK Broad Band(Mobile)
- Huawei Telecom(Malaysia)
**Micro COD - Concept**

- As the fiber cables are getting lighter, better “Constructability” and “Efficiency” required
- The Micro DUCT occasionally leads defect-occurrences due to its less intensity
- OPTIROAD’s Micro COD utilizes the strong facts of COD – “PHYSICAL STRENGTH” & “EXCELLENT CONSTRUCTABILITY”, but reduces SIZE and WEIGHT for the best work-efficiency.

- Protecting inner ducts from external pressures
- Against damages when peeling Outer-duct

- Corrugated surface optimizing “Pressure Intensity”, “Flexibility” and “Constructability”

- Colore Customized available

<table>
<thead>
<tr>
<th>Location</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>Brown</td>
<td>Purple</td>
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**DIMENSIONS**

- Inner Duct (Straight, HDPE)
- 1st Outer Duct (Straight, HDPE)
- 2nd Outer Duct (Corrugated, PP)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>D1 O.D</th>
<th>D1 I.D</th>
<th>D2 O.D</th>
<th>D2 I.D</th>
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<td>10.0</td>
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<tr>
<td><strong>7 WAY</strong></td>
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<td>10 X 7</td>
<td>47.0</td>
<td>12.0</td>
<td>10.0</td>
<td></td>
</tr>
</tbody>
</table>

- Development for more dimensions is now on-going. Customized sizes are available upon request.
DIMENSIONS

- Inner Duct (Straight, HDPE)
- 1st Outer Duct (Straight, HDPE)
- 2nd Outer Duct (Corrugated, PP)

FEATURES

- **Constructability & Safety**
  - Easily inserted owing to
    ① “Multi Ducts in One”
    → No additional work to insert inner ducts
    ② “Coiled up to 1,500 Meters”
    → No fittings required between Manholes
  - Excellent flexibility does NOT require
    EXTRA Manholes at the job site below.
    ① Curved Sections
    ② High and Low levels in a tough places
  - UV protection to avoid cracking ducts

- **Material for Strength**
  - Corrugated surface, strong enough for external pressures, made from HDPE, the most UNCRACKABLE material.
  - Shrink proof and Excellent endurance against heavy soil load
  - More than 2 times higher than Micro Duct in Compression Strength

- **Other Excellent Points**
  - Better use of a space by integral Multi-Ducts
  - Under tough conditions such as “Curved” or “U-Turn”, Air-blown installation is available over 1 Km
  - Various combination of Sub-ducts upon request
  - Not allowing for twisting of inner ducts
CONNECTOR

- Easy to adjust the length of Connector by One-touch connectors

- Connector (Waterproof)
  - PE straight pipe with sealing of water proof cover
  - The cover length: Freely adjustable

- Coupler
AGAINST EXTERNAL LOAD

The corrugated surface of the outer duct actually spreads the pressure over empty spaces
→ Inner ducts protected from a pressure when bending on a drum or even under the highest ground-pressure

The FLAT surface can NOT Spread a pressure
“DAMAGED INNER DUCTS”
- Reeled only with a wooden drum

The CORRUGATED surface DO Spread a pressure
“PERFECTLY PROTECTING INNER DUCTS”
- Reeled with a steel reel stay
**AGAINST EXTERNAL LOAD**

**MICRO COD**

![Image of MICRO COD](attachment:image1)

**MICRO DUCT**

![Image of MICRO DUCT](attachment:image2)

**ANTI COMPRESSION STRENGTH**

- **Pressure**
  - **34.2kgf/cm²**
  - **13.6kgf/cm²**

250% stronger than the same weight Micro Duct
EXCELLENT FLEXIBILITY

Amazing shape recovery ratio comes from excellent flexibility.
To compare with same weight Micro Duct, less transforming rate up to 40%!
EXCELLENT FLEXIBILITY

40%

Higher curvature Ratio than Micro DUCT (over 20 times of O.D)

“TOO MUCH BENT DUCT” may occur SERIOUS DAMAGES to the inner optical cable

“GOOD TO CURVE” makes it easier to use AIR-BLOWN SYSTEM at ANY JOB SITE!
Against Deformation

Outer Duct is NOT capable to Maintaining the out-shape
**Why MICRO COD?**

**EXCELLENT FLEXIBILITY**
- High Performance of Bending Radius / Flexural
- Installation on Curved and Slope

**EXCELLENT STRENGTH**
- Corrugated Duct will be dispersion of External Pressure
- Corrugated Duct + safety Layer → Double Protection

**EXCELLENT COST SAVING**
- Lower Weight and Producing cost down
- Shorten Working time

**EXCELLENT COMBINATION**
- Advantages of COD and Micro DUCT ➤ “MICRO COD”