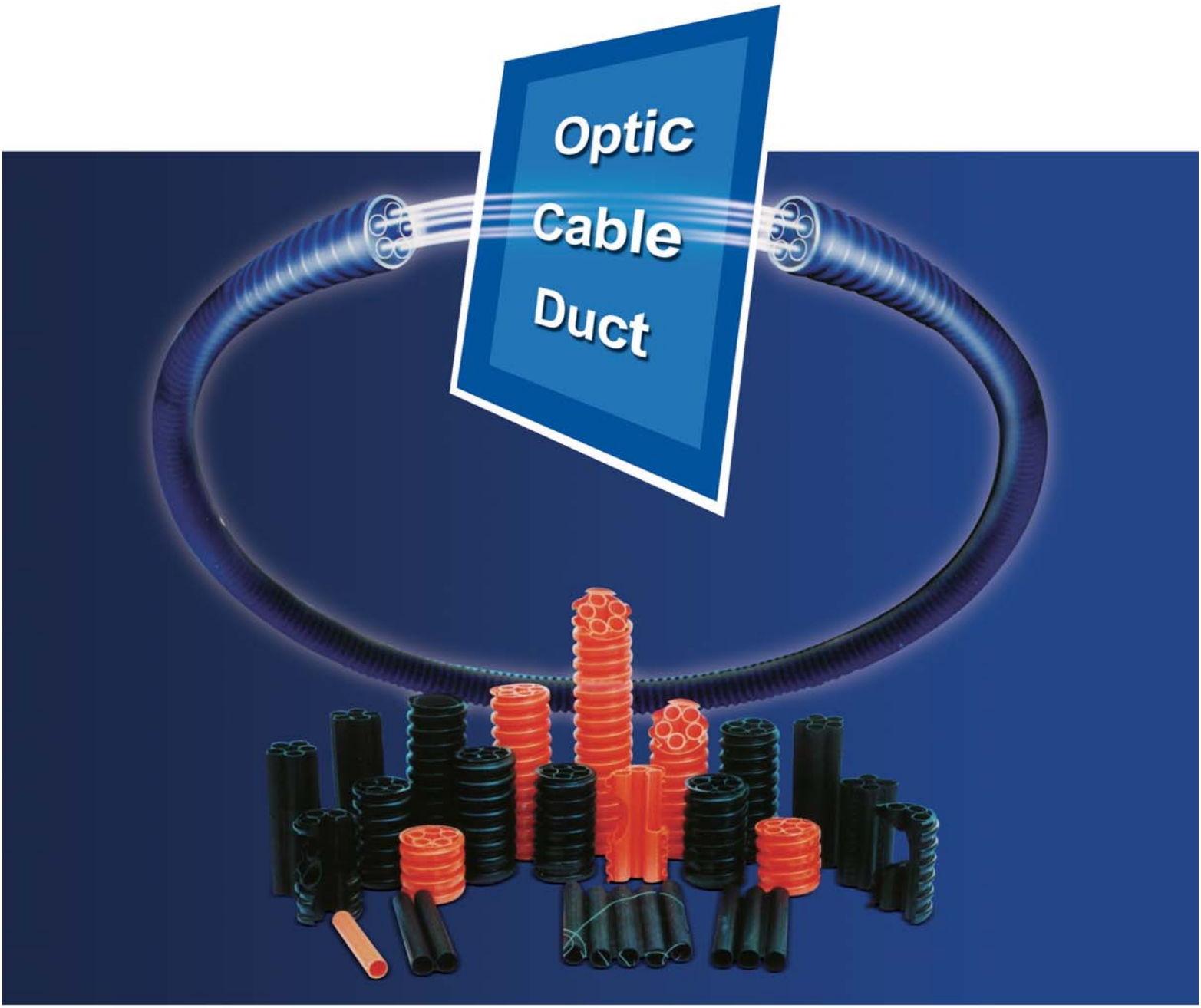
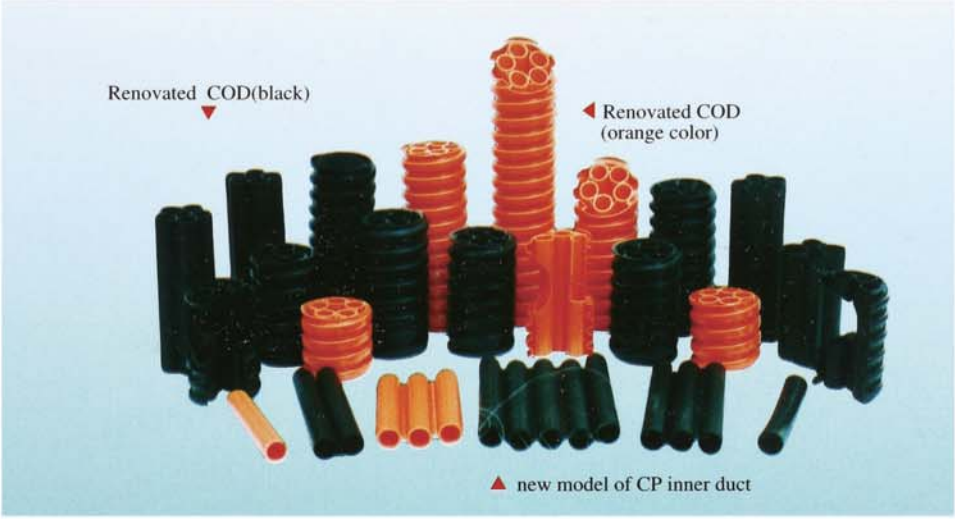
CORRUGATED OPTIC DUCT

COD opens and leads the New Era of Telecommunication &
Underground Power Cable Infrastructures.



OptiRoad Inc

COD(Corrugated Optic Duct)

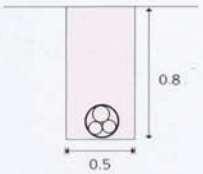
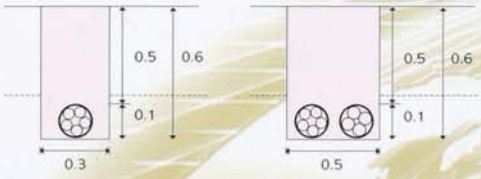


Owing to the assembly of inner ducts being straightened in the course of manufacture, easy insertion of Optic Cable without friction as well as great saving of Optic cable quantity is anticipated.

Dimension: ϕ 108(outer diameter) 5 inner tubes(ducts)

Length : 200M/Roll ~ 800M/Roll
(Customized length-cut is available)

< Comparison of conventional & COD Trench Dimension >

	Conventional		COD			
						
Outer Duct	110mm × 1 PVC		110mm × 1 COD		110mm + 122mm COD	
Inner Duct	ϕ 36 × 1 ϕ 28 × 2		ϕ 28 × 5		ϕ 28 × 5 ϕ 36 × 4	
	Total	3lines	Total	5lines	Total	9lines

COD(Corrugated Optic Duct)

▲ Simultaneous in stallation.

▲ Passing-through under bridge.

▲ COD laying out of 400m long customized roll.

▲ Coupling works.

▲ Completed coupler

▲ Easy to handle owing to light weight (40meter roll without spool)

COD(Corrugated Optic Duct)

COD skips:
a. individual connection works of conventional PVC outer ducts, and
b. insertion work of multiple inner ducts, owing the product being integrated both outer and inner ducts as readily built-in as one-body in the course of production.
COD prevents water inlet, and is highly recommended for underground duct of Power Cable.

▲ Roll mounted COD releases and straightens easily for installation

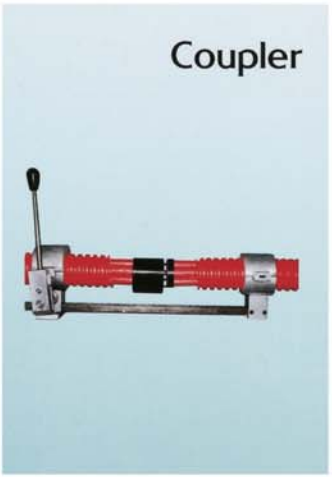
Coiled on spool for customized length

▲ COD by-passes hurdles owing to its flexibility

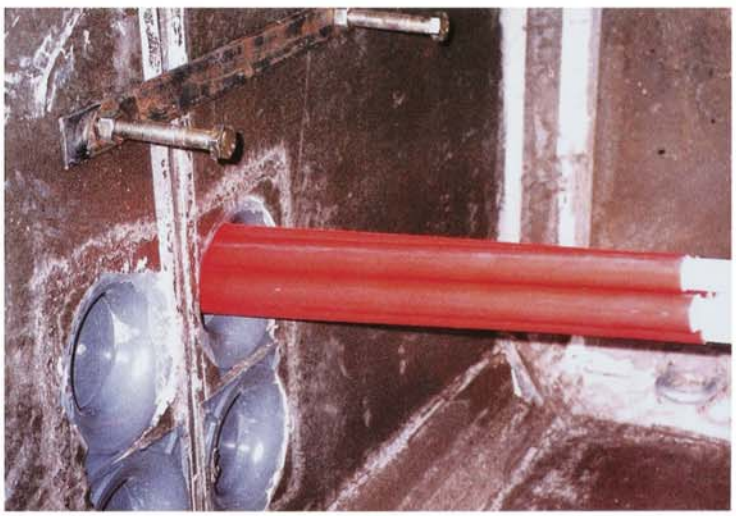
COD(Corrugated Optic Duct)

▲ Demonstration of straightend COD

▲ Easy loading



▲ Easy release from reel



▲ COD connected into manhole chamber

COD(Corrugated Optic Duct)



▲ Laying of COD through/under hurdles.

▲ Installation along with bridge: COD with UV protection.

Laying of 3 COD lines at the same time, in a residential area.

▲ Easy releasing COD from spool.

▲ Inlet of cable form pole.

▲ Multiple COD line installation work for 500m mahole interval.

▲ Ready for connection manhole.

COD installation and connection to manhole.

▲ Chamber of manhole with COD connected.

▲ Temporary COD laying along walkway.

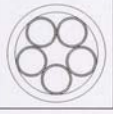
▲ Manhole connectors fixed on COD.

COD(Corrugated Optic Duct)

Taiwan CPC Project

Machines of COD installation

Model & Dimensions of COD

Code of Model	Inner duct		Dimensions of Inner Duct(mm)			Dimensions of Outer Duct(mm)			Unit Weight (Kg/meter)
	Section	Numbers	I.D.	Thickness	O.D.	I.D.	O.D.	Pitch	
COD-3B		3	28±1	2.5±0.5	33±1	72±2	93±2	25.4±1	1.70±
Insertion of Fiber Optic Cable: Under ϕ 22.4mm									
COD-3D		3	36±1	2.8±0.5	42±1	89±2	110±2	25.4±1	2.12±
Insertion of Fiber Optic Cable: Under ϕ 28.8mm									
COD-4B			28±1	2.5±0.5	33±1	79±2	100±2	25.4±1	2.40±
Insertion of Fiber Optic Cable: Under ϕ 22.4mm									
COD-4D		4	36±1	2.8±0.5	42±1	100±2	122±2	25.4±1	2.61±
Insertion of Fiber Optic Cable: Under ϕ 28.8mm									
COD-5B		5	28±1	2.5±0.5	33±1	89±2	110±2	25.4±1	2.27±
Insertion of Fiber Optic Cable: Under ϕ 22.4mm									
COD-5AD		5	4×26±1 1×36±1	2.5±0.5 2.8±0.5	31±1 42±	89±2	110±2	25.4±1	2.20±
Insertion of Fiber Optic Cable			26mm : Under ϕ 20.8mm 36mm : Under ϕ 28.8mm						
Tolerance			±1mm	±0.5mm	±1mm	±2mm	±2mm	±1mm	

Reference:

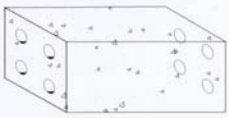
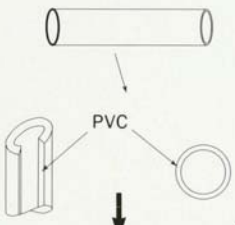
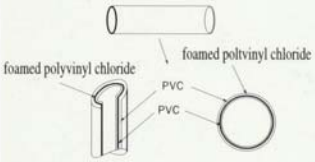
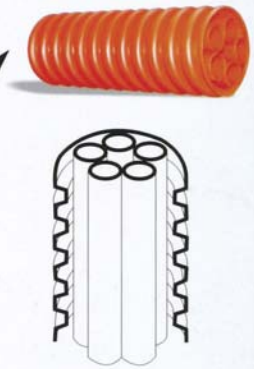
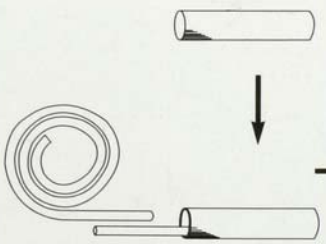
* Max. ϕ of inserting cables through COD:80% of internal ϕ of Inner Duct.
* Max. ϕ of inserting cables through PVC duct:50% of internal ϕ of Inner Duct.

* Explanation of Model Code:Example:(COD 5AD)

COD	5	AD	Remarks
↓	↓	↓	Code I.D.:
Product Code	Total numbers of Inner Ducts	Inner Ducts Dimension Code	A → 26mm B → 28mm D → 36mm

COD(Corrugated Optic Duct)

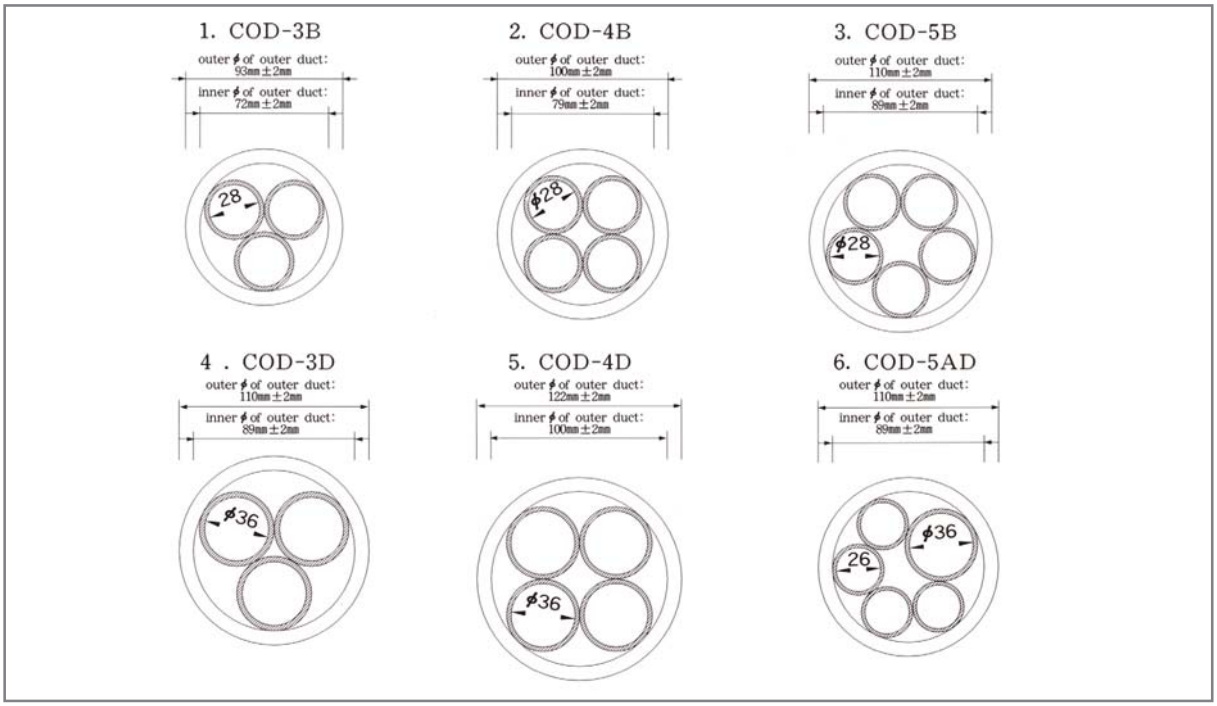
History of the underground pipe channel progress

Description	Past	Present	Future(time to come)
underground pipe channel	concrete pipe(1945-1960) 	PVC(1970~1990)  FC(1980~2000) 	COD(after 2000) 
major material	cement+sand+aggregate	PVC, foamed vinyl chloride	High density polyethylene
environmental evaluation	pollution from concret wastes	noxious material to environment(causes pollution)	environment-friendly material (free from pollution)
merits and demerits	① Water inlet through connecting point. ② Water inlet ③ The maximum coefficient of friction ★ Excessive provisional tension is required ★ Cause damage of outer cover of the cable ④ Inflexible ⑤ Removal of the connecting point is possible ⑥ Limited length on one meter.	① Water inlet through connecting point. ② The coefficient of contraction is high ③ The coefficient of friction is high ★ Excessive provisional tension caused by the twisting of inner duct is required ④ Solid(not flexible). ⑤ Vulnerable to impaction(easy to damage). ⑥ Limited length on 6 meter's long.	① Free from water inlet (perfect water proof). ② Minimum contraction owing to jagged form. ③ The minimum coefficient of friction ★ Easy to insert cable through the perfectly aligned inner duct ④ Flexible ⑤ Strong against impact(do not break) ⑥ Keep as in D/M condition (over 200M)
inner ducts insertion			 Readily inserted

Comparison between COD and conventional product

Description	Conventional products		New Product	
	PVC & FC duct	PE duct	CP duct	COD
material	① PVC ② foamed polyvinyl chloride	Polyethylene	High density polyethylene	High density polyethylene
shape	① Duct made of PVC ② PVC+foamed vinyl chloride+PVC duct ③ Flat surface of inside and outside duct.	① One piece duct made of Polyethylene ② Flat surface of inside and outside duct.	① The connected duct made of over two ducts with a jointed membrane ② Jaggy form.	① Corrugated concavo-convex shape. ② Multiple inner ducts are readily built-in ③ The inside of inner duct is protruded connecting
connection	In every 6 meters.	None	None	None
weight	medium	light	light	light
working condition	medium	medium	fine	fine
flexibility	medium	fine	fine	fine
coefficient of friction	high	medium	low	low
tension	high	high	low	low
strength	weak	strong	strong	strong
use of inner space	—	low	high	high
torsion of the inner duct	—	occur	free from torsion	free from torsion
breakage	—	may occur	free from crash	free from crash
color	grey	black	orange color	orange color
environment-friendly	noxious property	innoxious	innoxious	innoxious
economical efficiency	medium	medium	economical	economical

Structure and Dimensions of COD



COD IS STRONG AGAINST LOAD.

Installed along with bridge

PVC Duct (soft)

COD

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