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CREATING WHAT CONNECTS US

Dura-Line Product Solutions





“

In the next decade, the Internet of Things (IoT) and the 4th Industrial Revolution will bring 50 billion devices online and provide access to the internet to the rest of the world’s population. Dura-Line provides the essential infrastructure to make this possible.”

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Dura-Line is a leading global manufacturer of critical conduit infrastructure for digital networks including ducts, MicroDucts and accessories. A pioneer in MicroTechnology, Dura-Line was the first manufacturer of fiber optic subduct in 1981 and, in total, has been making connections possible across telecom, CATV, wireless, and enterprise networks for more than 50 years.

With innovative product solutions, unparalleled customer insight, strong production capabilities and high-quality standards, Dura-Line is perfectly poised to support fibre deployments across Europe.

www.duraline.com

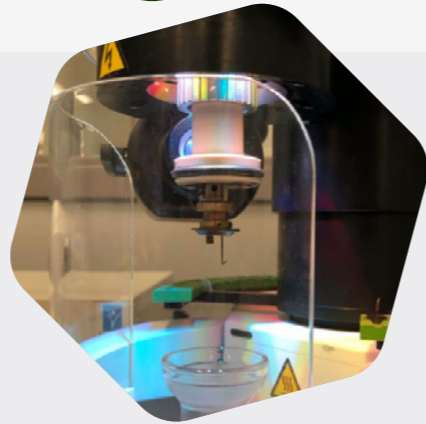


Dura-Line has a strong global footprint including 21 plants, 3 Research & Development Centers, and 4 Testing Facilities where we conduct product, tooling, and additives testing. With such an extensive range of manufacturing facilities, Dura-Line is able to offer short lead times and fast delivery in the market.

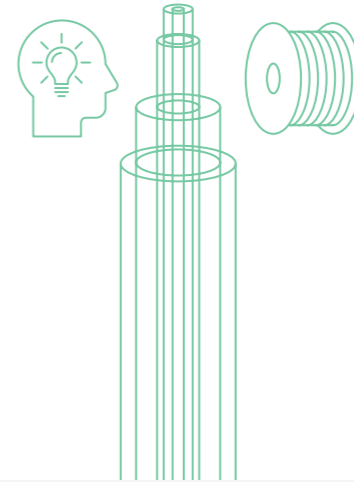
- 21 Plants
- 3 Research & Development Centers
- 4 Testing Facilities



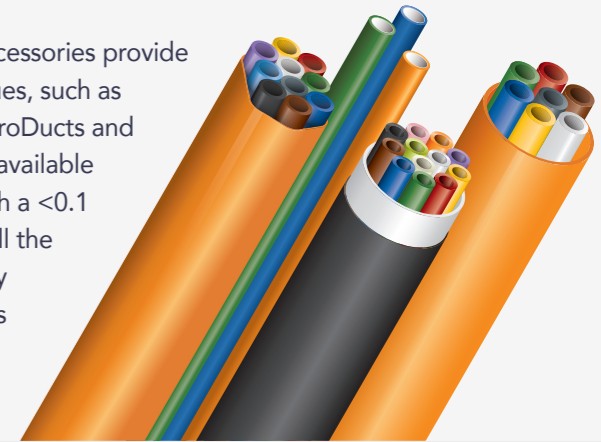
Dura-Line is committed to quality. The company is certified according to international standards ISO 9001, ISO 14001 and ISO (OHSAS) 18001. Dura-Line's products and plants are also externally certified by various leading independent European institutes, such as SKZ, VDE, and the CSI laboratory. Dura-Line's MicroTechnology products are designed for a 25+ year operational lifetime.



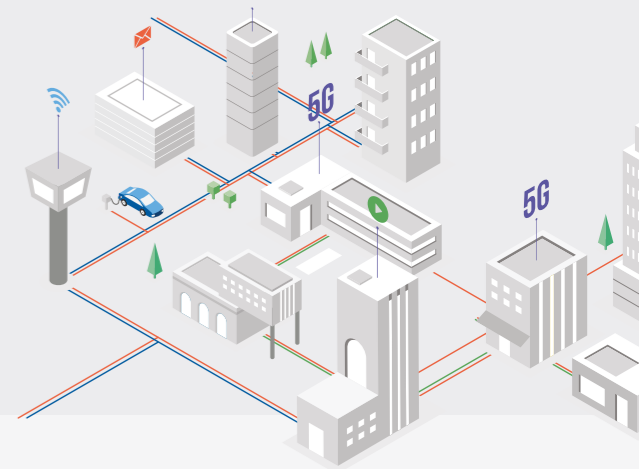
Dura-Line is a reliable partner to its customers, providing technical support from the concept and design stages, through construction and operation. A team of experienced Solution Architects provides engineering support to customers in the field, wherever they are in Europe.



Dura-Line's advanced range of ducts, MicroDucts, and accessories provide solutions for various applications and installation techniques, such as underground, aerial, and in-house environments. The MicroDucts and bundles are UV-stabilized for short or long term and also available with SILICORE®, a permanently-lubricated inner lining with a <math><0.1</math> coefficient of friction for maximum cable jetting length. All the conduits and MicroDucts can be manufactured in a variety of sizes and colours, with stripes and custom print streams available for ease of identification. Fire-retardant and antirodent varieties are also available.



Dura-Line is a global leader in MicroTechnology with solutions like MicroDucts and FuturePath that empower operators to create future-ready, multi-use networks to support whatever comes next. The company helps customers tap into existing infrastructure, using techniques like OverRides to minimize labor and material requirements – resulting in reutilization of assets, reduced installation costs, and faster time to market.



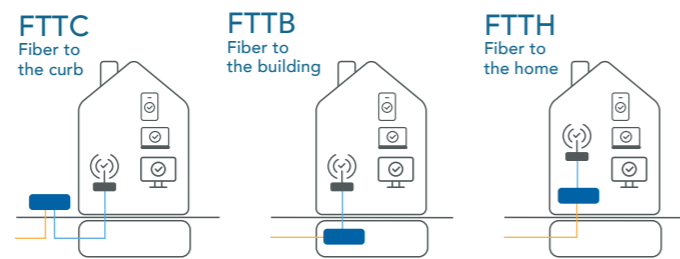
- Zero-Waste-to-Landfill
- Renewable Energy
- Material Re grind

Dura-Line has pledged support to the United Nations' Sustainable Development Goals. All the European plants have reached Zero-Waste-To-Landfill. Other examples of responsible manufacturing include closed loop water systems, the use of renewable energy, material regrind programs, and the reel return program. Dura-Line recently launched MicroDucts and FuturePath® ECO, an innovative product range that delivers a significant reduction in carbon emissions with no compromise on technical performance.

Applications

The availability of a strong broadband connection is important for daily life and the economic development of cities and rural communities. Fibre networks are recognised around the world as the best long term solution for data connectivity with government-funded projects expediting broadband roll out for industrial, and private customers.

There are various stages of fiber optic network deployment:



The fast growth of internet use and data-driven online services is challenging our existing telecommunications systems and forecast demand for more bandwidth requires a flexible approach to fiber optic network design.

Dura-Line offers a wide range of products and solutions to simplify the deployment of fiber networks in the most future-proof possible manner.

Our conduit solutions are ideal for various applications and installation techniques:

Applications:

- FTTx
- Wireless Networks
- Enterprise Networks
- Metropolitan Networks
- Smart Cities
- Backbone Network Infrastructure
- CATV/MSO
- In-Building Installations
- Railway or Road Tunnels
- Aerial Overhead Networks

Installation techniques:

- Trench
- Sub-ducting
- Plow
- MicroTrench
- Aerial
- Tray
- Override / subducting
- Confined Spaces
- Horizontal Directional Drilling
- In-Building

Quality Control

Across the globe, our ISO certified quality regime demands a wide range of tests to ensure consistent high performance from our products. All our production and quality measurement records are stored and fully trackable and available to customers for quality inspections or review. Typical tests include:

Production

- **BB Test** – Steel ball with a diameter of the minimum of 80% of the product internal diameter is blown into the duct, to confirm that the inner diameter meets specification.
- **Operational Pressure Test** – Ducts are pressurized up to 6-15 bar to confirm no leakage.

Laboratory

- **Dimension Check** – Measurement of the duct outer diameter, wall thickness and ovality.
- **Yield Strength** – Duct samples are pulled to their yield point, to detect any change in material composition.
- **Crushing** – Conduit is compressed to verify outer pressure resistance.
- **Inner Friction** – Confirmation that the duct inner layer meets the required static friction limit.
- **Bending Test** – A sample of the duct, located on two supports, is bent to check that sagging does not exceed specification.
- **Longitudinal Reversion** – Duct must not shrink/expand excessively when subject to temperature changes.
- **Print Quality** – Text printed on duct must remain legible after expected manipulation, like rubbing.
- **Environmental Stress Crack Resistance** – Materials used in production must remain stable after being exposed to a combination of a surface-active agents, bending and elevated temperatures.



Dura-Line is certified to ISO 9001 ISO 14001 and ISO 45001.

- **Oxidation-induction Time** – The time needed for the material to start thermos-oxidation processes.
- **Long-term Internal Creep Compressive Test** – Duct is pressurized according to sigma pressure within a range of 4.0 to 4.6 MPa for 170 hours, in an 80 °C bath with no leakage accepted. Testing conditions may also be modified to include the effect of ice formation, either inside or outside of a tested duct.
- **Burst Pressure** – At ambient temperature, a duct sample is pressurized until it breaks. The test is important to ensure that the maximum blowing pressure is suitable during installation.
- **Homogeneity** – microscopic analyses that allow the identification of any irregularities or deviations from the expected material structure



DISCOVER OUR INNOVATIVE PRODUCTS

Dura-Line is the global leader in digital infrastructure combining proven quality and production power. Our innovative products serve as solutions that address the key challenges of humanity.

- Innovative and sustainable product range
- Flexible and suitable for various applications and installation techniques
- Quality confirmed by stringent internal tests and external certification
- Choice of material including HDPE, reground HDPE, fire-retardant, antiodent, antistatic
- Solutions for underground, in-building and aerial environments



Space efficient MicroDucts

- Size range from 4 mm - up to 20 mm OD (Outer Diameter)
- Ideal for installation in existing duct or direct buried
- High network flexibility
- Rapid install



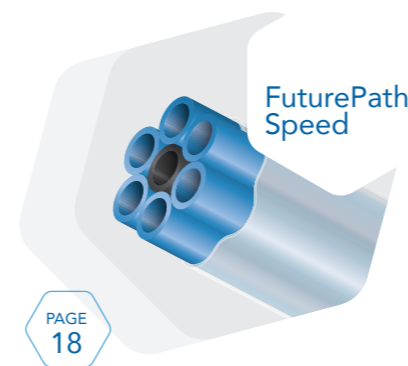
Pre-configured bundles of MicroDucts

- Minimizes installation cost and time
- Maximizes space usage
- Eliminates crossed duct pinch-points
- Ideal for future-proof, flexible networks
- Individual protection for shared conduits



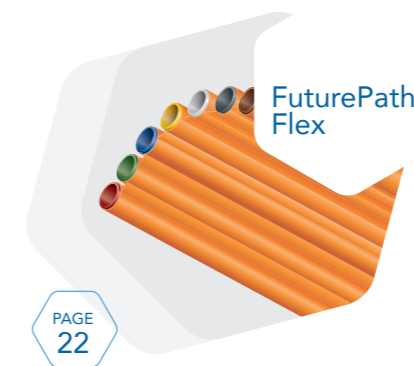
Up to 100% reground Dura-Line scrap HDPE

- Contribute to lower scope 3 emissions for network operators
- Meet stipulated parameters for regular products
- Equivalent spiraling prevention and jetting performance to regular products in key field tests



Pre-configured MicroDuct bundles

- Ideal for override
- Minimizes installation cost and time
- Eliminates crossed duct pinch-points
- Highly flexible during installation



Pre-configured flat MicroDuct bundles

- Ideal for micro-trenching
- Minimizes installation cost and time
- Eliminates crossed duct pinch-points
- Highly flexible during installation



Pre-configured duct with subducts

- High impact resistance
- Minimizes installation cost and time
- Improves space utilization
- Highly flexible and future proof



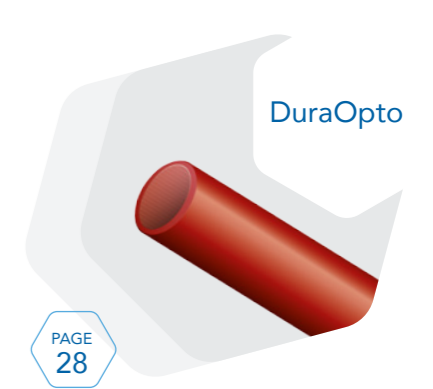
Pre-configured bundles for demanding applications

- High tensile strength for demanding pull-in applications
- High scratch resistance during the pulling process
- Stiff construction to prevent undulations



Airborn MicroDucts for overhead future proofing

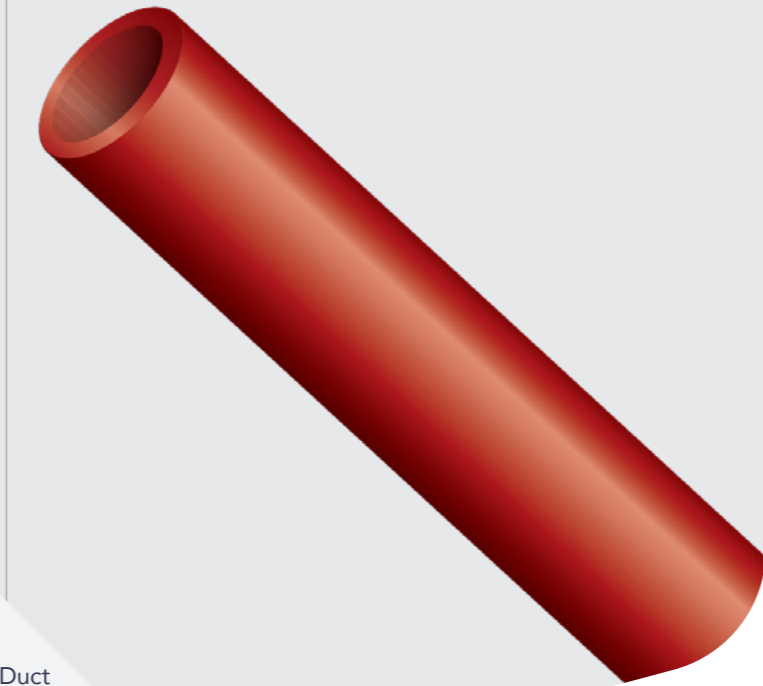
- Lightweight metal free construction
- High UV resistance in Central European climactic conditions
- Aerial products are particularly suitable for rural regions



Standard Silicore™ lined HDPE duct

- Size from Ø 25 to 50 mm
- Internal low friction layer and internal ribs to maximise blowing performance
- Pressure resistant to 15 bar
- Can be delivered on segmented drums or coiled with several lengths on one drum

MicroDucts HDPE



MicroDucts HDPE is a great way of getting the most versatility out of your current empty duct system as well as create a new direct buried pathway.

Why install one fiber cable when you could install multiple MicroDucts? Each MicroDuct is a pathway for fiber now or in the future.

MicroDucts HDPE is offered in two variations, DB (Direct Buried) and DI (Direct Install). MicroDucts HDPE DB is a range created to withstand impact and suitable to be directly buried while MicroDucts HDPE DI (Direct Install) is a MicroDuct range designed to be installed by pulling, blowing, or pushing in existing duct systems. MicroDucts HDPE can be used in bundles forming FuturePath HDPE.

Technical Features:

- Made from top quality HDPE (High Density Polyethylene)
- Internal low friction layer SILICORE® or SILICORE® ULF and internal ribs to maximize blowing performance
- Pressure resistance minimum 15 bar
- Optional Anti-Static function inner layer reduces friction caused by static electricity build-up during fibre installation
- Available in 12 opaque RAL colours with or without identification stripes
- Available in natural colour with or without identification stripes
- Utilize space in an occupied duct
- Installation can be done with single MicroDucts or bundles (FuturePath®)

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

- 1 DuraFit Reducer
- 2 DuraFit Connector
- 3 DuraGasBlock Connector/Reducer
- 4 DuraFit Endstop



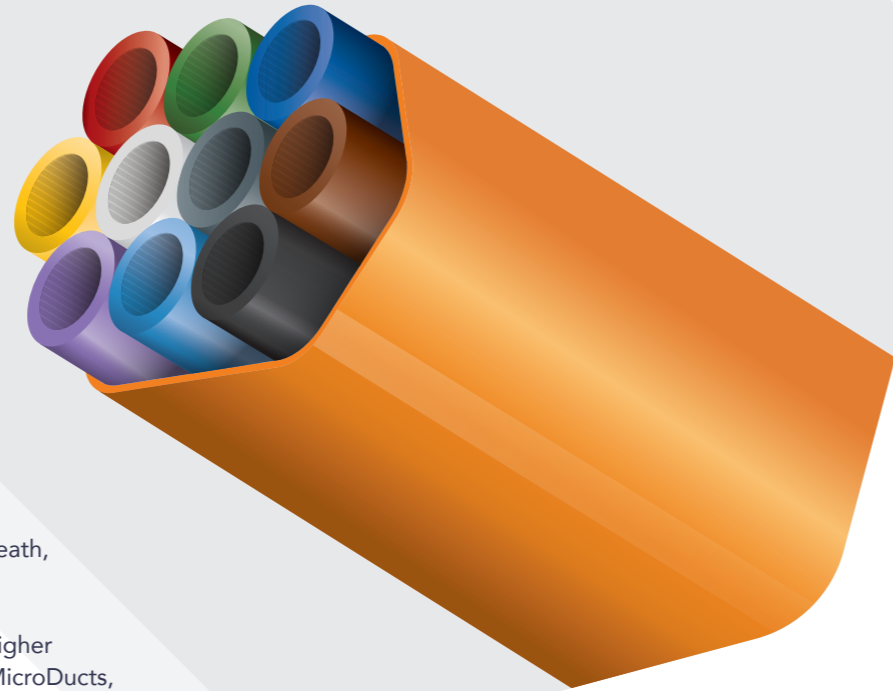
MicroDucts Direct Install (DI)

MicroDucts (OD/ID mm)	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
4/3	60x40x47	4000	27
5/3,5	60x40x47	2250	27
	120x46x35	5000	68
7/5,5	60x40x47	1250	23
	120x46x35	5000	91
8/5,5	60x40x47	1000	31
	120x46x35	4500	134
10/8	60x40x47	500	19
	120x46x35	2500	88
12/9,6	120x46x36	2000	98

MicroDucts Direct Bury (DB)

MicroDucts (OD/ID mm)	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
7/4	60x40x47	1250	40
	120x46x35	5000	144
7/3,5	60x40x47	1250	40
	120x46x35	5000	158
10/6	60x40x47	500	30
12/8	120x46x35	2000	140
14/10	120x46x35	1500	128
16/12	120x46x35	1250	125
18/14	120x52x50	1000	182
	150x67x60	2500	399
20/15	120x52x50	1000	217
	150x67x60	2000	421

FuturePath HDPE



FuturePath ducts are pre-configured MicroDuct bundles with a thin over-sheath, designed for quick, one-step installation.

Our Direct Bury (DB) versions contain MicroDucts with thicker walls and a higher crush resistance. The thin over-sheath allows easy access to the individual MicroDucts, which can be connected with simple connectors eliminating the need for protective enclosures and branch-off boxes. Direct Insert (DI) versions contain MicroDucts with thinner walls and are designed to be installed inside existing conduits providing multiple pathways for cable installations. They are typically pulled into main conduits from manhole-to-manhole or inside MDUs as a main riser duct route.

FuturePath bundles allow the combination of different size MicroDucts under an over-sheath creating highly.

Technical Features:

- Exceptional network flexibility
- Customized configurations
- No special tools - uses industry standard tools
- Very high crush resistance

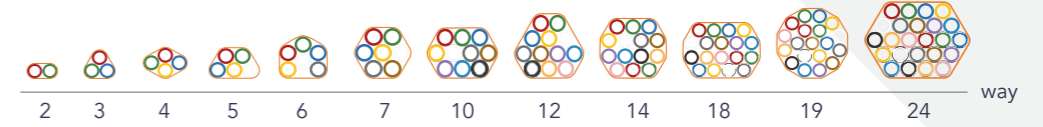
Accessories

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- 1 DuraFit Reducer
- 2 DuraFit Connector
- 3 DuraGasBlock Connector/Reducer
- 4 DuraFit Endstop



We manufacture FuturePath HDPE in the following standard configurations for faster availability. Custom configurations are also available.



FuturePath HDPE configurations for Ø7/4 and 7/3.5 MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	120x46x35	2250	192
	120x52x50	3000	311
3x	120x46x35	1250	153
	150x60x67	3500	520
4x	120x46x35	1250	190
	150x60x67	3500	623
5x	120x52x50	1000	247
	150x60x67	2500	562
6x	120x52x50	1000	275
	150x60x67	2250	584
7x	120x52x50	1000	301
	150x60x67	1750	532
10x	190x90x100	4000	1086
	150x60x67	1250	521
12x	190x90x100	3000	1103
	150x60x67	1000	506
14x	225x90x100	3500	1546
	150x60x67	1000	560
18x	225x90x100	3500	1735
	150x60x67	750	538
24x	225x90x100	3000	1853
	190x90x100	1250	1055
	225x90x100	2000	1649

FuturePath HDPE configurations for Ø10/6mm MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	120x46x35	1250	188
	150x60x67	3000	550
3x	120x52x50	750	223
	150x60x67	2000	526
4x	120x52x50	750	264
	150x60x67	1750	574
5x	150x60x67	1250	521
	190x90x100	3000	1103
6x	150x60x67	1000	500
	225x90x100	4000	1749
7x	150x60x67	750	449
	190x90x100	2000	1010
10x	225x90x100	3000	1548
	190x90x100	1500	1035
12x	225x90x100	2500	1722
	190x90x100	1250	1035
14x	225x90x100	2000	1666
	190x90x100	1000	972
18x	225x90x100	1750	1680
	190x90x100	1000	1177
24x	225x90x100	1500	1797
	240x120x100	1000	1055



FuturePath HDPE Configurations for Ø12/8mm MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	120x52x50	1000	246
3x	120x52x50	500	199
	150x60x67	1250	441
4x	225x90x100	4500	1349
	150x60x67	1250	496
5x	225x90x100	4000	1406
	150x60x67	750	426
6x	190x90x100	2000	948
	225x90x100	3000	1404
7x	150x60x67	750	475
	190x90x100	1500	862
10x	225x90x100	2750	1492
	190x90x100	1250	831
12x	225x90x100	2000	1291
	190x90x100	1000	894
14x	225x90x100	1500	1323
	190x90x100	750	825
18x	225x90x100	1250	1322
	240x120x100	1250	1512
	240x120x100	1000	1530

FuturePath HDPE Configurations for Ø14/10mm MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	120x52x50	750	167
	150x60x67	1750	492
	190x90x100	4000	993
3x	150x60x67	1000	427
	190x90x100	2000	765
4x	225x90x100	3500	1268
	150x60x67	750	418
5x	190x90x100	1750	927
	225x90x100	3250	1463
6x	150x60x67	500	369
	190x90x100	1500	870
7x	225x90x100	2250	1288
	190x90x100	1000	730
10x	225x90x100	2000	1335
	190x90x100	1000	804
	225x90x100	1500	1187
	225x90x100	1250	1319

FuturePath HDPE Configurations for Ø16/12mm MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	150x60x67	1250	434
	225x90x100	4000	1208
3x	150x60x67	750	391
	190x90x100	1500	694
4x	225x90x100	2750	1183
	190x90x100	1500	836
5x	225x90x100	2500	1340
	190x90x100	1000	722
6x	225x90x100	1750	1193
	190x90x100	750	664
7x	225x90x100	1250	1053
	240x120x100	1500	1233
	240x120x100	1250	1190

FuturePath HDPE configurations for Ø20/15mm MicroDucts

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
2x	150x60x67	750	410
	225x90x100	3250	1427
3x	190x90x100	1000	709
	225x90x100	1750	1170
4x	190x90x100	900	894
	225x90x100	1500	1323
5x	225x90x100	1000	1137
6x	240x120x100	750	1070
7x	240x120x100	750	1176

Special FuturePath HDPE Configurations

Custom configurations available, please contact your sales representative for more information.

Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
8x7/4+1x12/8	150x60x67	1000	473
	225x90x100	4000	1592
22x7/4+1x12/8	190x90x100	1000	917
	225x90x100	1750	1534
12x7/4+1x14/10	150x60x67	750	466
	225x90x100	2750	1169
24x7/4+1x14/10	190x90x100	1000	1006
	225x90x100	1500	1492

MicroDucts & FuturePath ECO

MicroDucts and FuturePath bundle made from up to 100% internal Dura-Line, reground High-Density Polyethylene (HDPE). The products contribute to lower scope 3 emissions for network operators and is suitable for direct-buried or sub-duct installation in outdoor optical communications networks. Multiple MicroDuct sizes and bundle combinations are available, and all products meet stipulated parameters for regular MicroDuct products.

Technical Features:

- **Sustainable:** contributes to lower scope 3 emissions. A verified Life Cycle Assessment (LCA) is available.
- **Up to spec and proven performance:** meet stipulated parameters for regular HDPE and has equivalent spiraling prevention and jetting performance to regular products in key field tests
- **Backwards-compatible:** can be installed in existing networks in combination with regular MicroDucts
- **Multiple MicroDuct sizes** and bundle combinations are available
- **Proven process:** Dura-Line has manufactured products from reground material for more than 15 years

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

- 1 DuraFit Reducer
- 2 DuraFit Connector
- 3 DuraGasBlock Connector/Reducer
- 4 DuraFit Endstop



Our vision is to continue to manufacture products that last while reducing the impact on the environment of their installation and disposal. We've collaborated with our customers to develop products that meet their needs and achieve our shared sustainability goals.

MicroDucts and FuturePath® ECO Life Cycle Assessment

Whenever possible, we aim to collaborate with our customers to reach their Scope 3 emissions reduction targets. A comprehensive, third-party administered life cycle assessment (LCA) of the MicroDucts and FuturePath® ECO product range demonstrated a significant reduction in carbon emissions versus regular conduit. This LCA is available upon request.

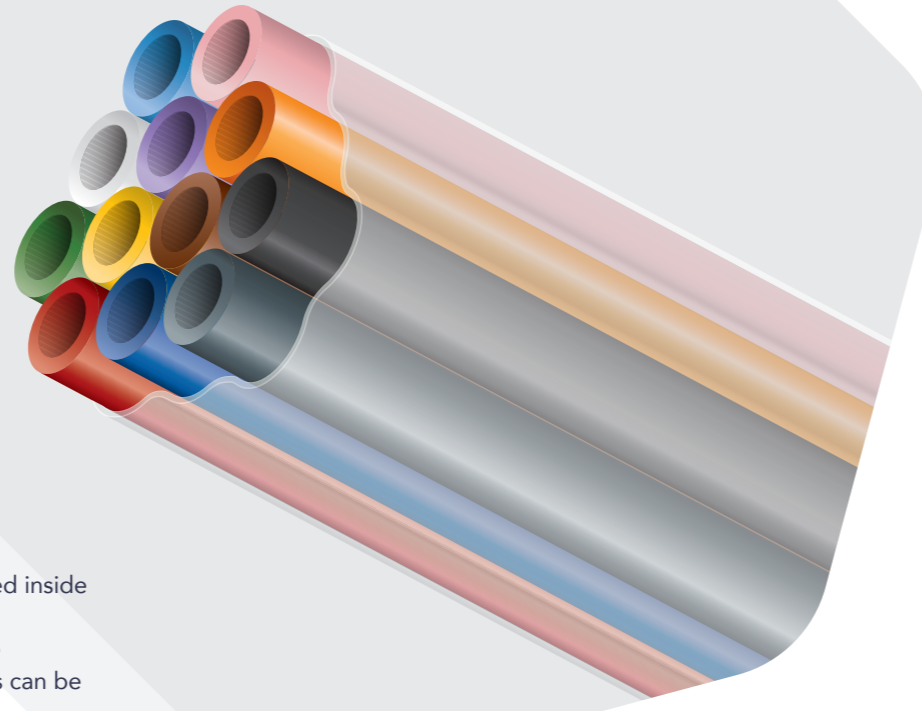
KPN Reference Case

Dura-Line's customer KPN, a leading network operator in The Netherlands, was impressed by the quality of MicroDucts and FuturePath® ECO and agreed that it aligns with their sustainability goals.

Thanks to close collaboration between Dura-Line, customer, and installer, MicroDucts and FuturePath® ECO were swiftly approved for installation in KPN's nationwide network, with the first successful deployment taking place in The Netherlands in 2023.



FuturePath Speed



FuturePath Speed's lightweight design creates multiple pathways when placed inside an existing, unoccupied route. Comprised of MicroDucts (DI) MicroDucts in several configurations. Long segments can be created to optimize long cable blowing distances. Installation of FuturePath Speed into existing empty ducts can be accomplished by blowing, pulling or pushing.

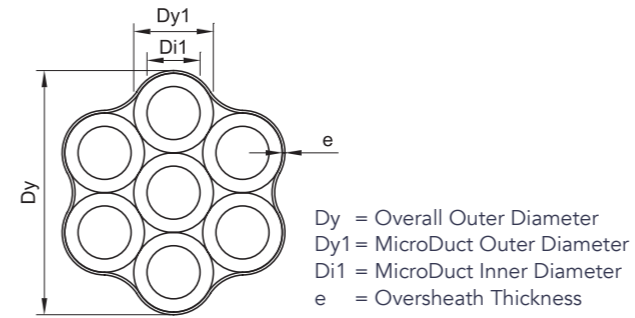
Technical Features:

- Made from HDPE (High Density Polyethylene)
- Pressure resistance up to 15 bar
- High-quality materials formulated for long-life expectancy
- Thin outer sheet for compact construction
- Inner friction of MicroDucts < 0,1
- Long blowing distances at optimal fill ratio of 80%
- During installation, no need to pressurize individual MicroDucts pathways
- Lower total costs with reduced handling requirements
- Detailed specifications on request

Accessories

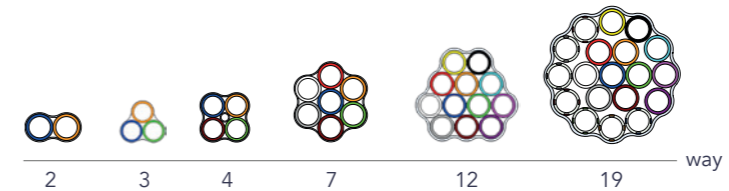
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- 1 DuraFit Reducer
- 2 DuraFit Connector
- 3 DuraGasBlock Connector/Reducer
- 4 DuraFit Endstop



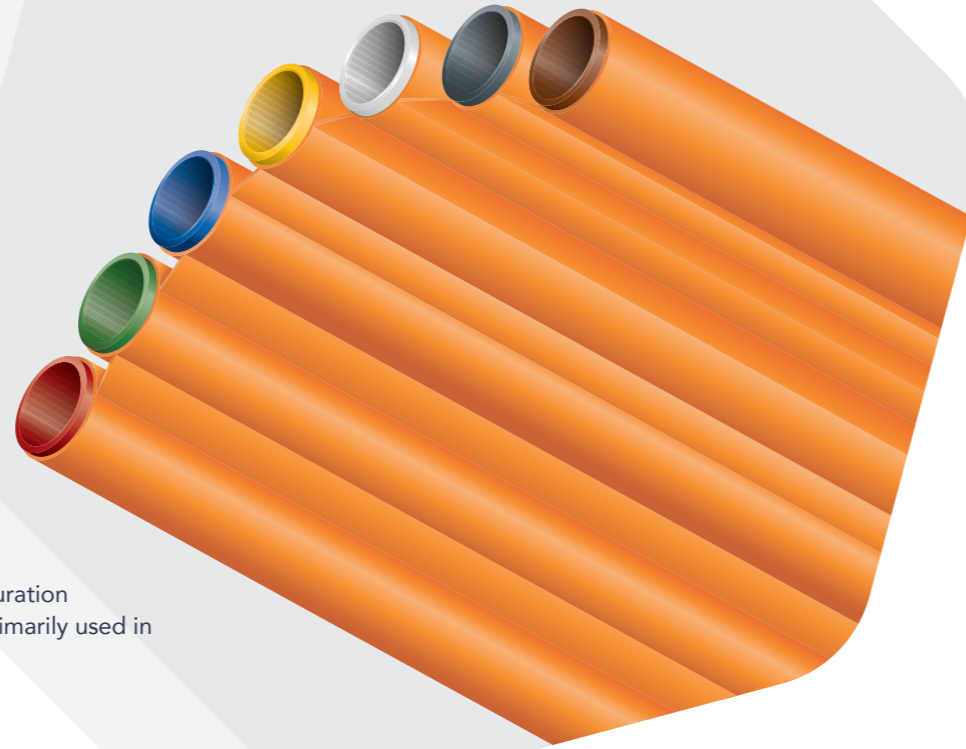
FuturePath Speed HDPE Configurations

Size + Configuration	Outer Diameter (mm)	MicroDuct ID (mm)	MicroDuct OD (mm)	Overshoot Thickness (mm)	Length (m)	Drum Dimensions (cm) (height x core x width)
7x5/0,6	16	3,8	5	0,5	2000	150x52x50
4x10/1,0	25	8,0	10	0,5	2700	160x80x100
7x10/1,0	31	8,0	10	0,5	2000	210x110x100
3x12/1,2	26,9	9,6	12	0,5	2000	190x100x100



Other drums, configurations and lengths on request. Also available with antistatic inner layer for fiber bundle.

FuturePath Flex



FuturePath Flex consists of direct-buried (DB) MicroDucts in a flat configuration connected with a thin webbing. This unique shape, with thin profile, is primarily used in MicroTrenching applications.

Technical Features:

- Up to 8 MicroDucts in one bundle
- SILICORE® or SILICORE® ULF, permanently lubricated inner lining provides lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Easy to remove outer sheath provides access to individual pathways
- Can be placed inside existing pathways for subducting
- Anti-static inner layer reduces friction caused by static electricity build-up during fibre installation
- Branching is simple with a Dura-Line connector
- User-friendly deployment of multiple MicroDucts

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

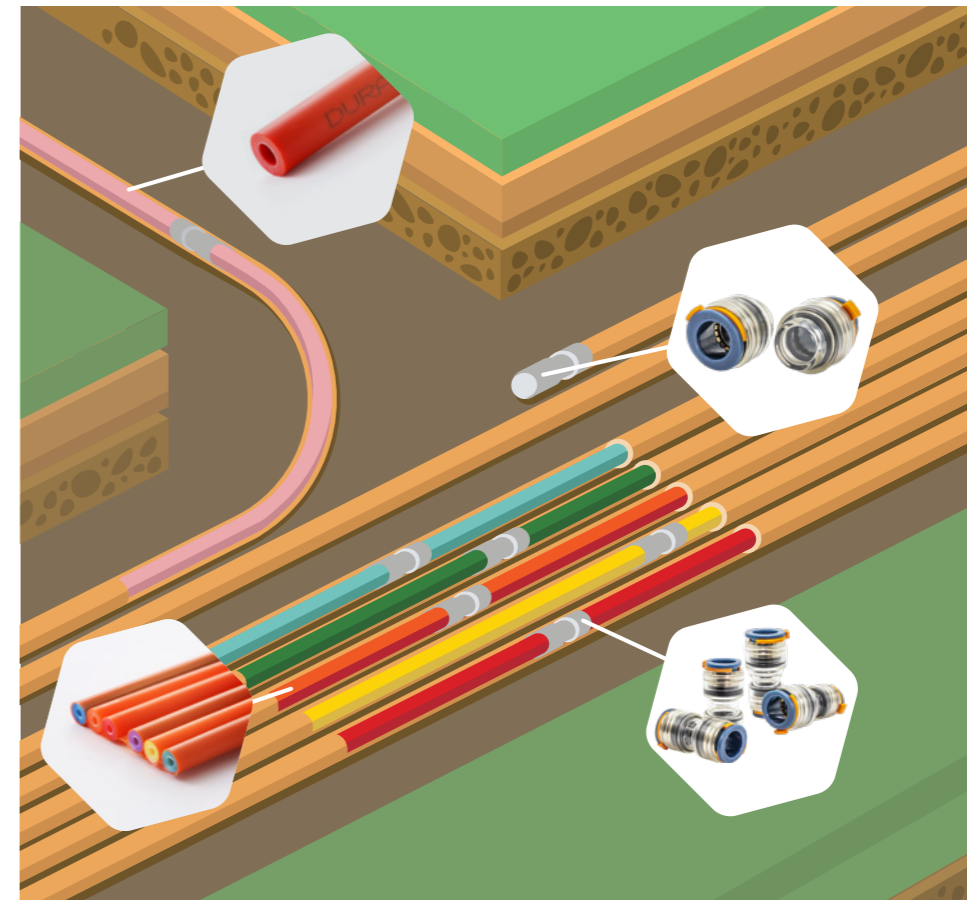
- 1 DuraGasblock Terminator
- 2 DuraFit Connector
- 3 DuraFit Endstop



FuturePath Flex Configurations

MicroDucts (OD/ID mm)	Config x	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
5/3,5	4x	120x52x50	2000	234
12/8	4x	190x90x100	2300	792
14/10	4x	150x60x67	750	435
		190x90x100	1750	972
	5x	190x90x100	1400	825
16/12		225x90x100	2100	1280
	7x	225x90x100	1500	1383
	6x	225x90x100	1400	1350
20/16	8x	225x90x100	1000	1234
	4x	225x90x100	1250	1414
20/16	6x	225x90x100	800	973

More dimensions on customer request possible



DuraPack

DuraPack provides MicroDucts factory pre-installed into a larger conduit with more efficiency than can be easily achieved on site. Loose bundles of MicroDucts within a larger conduit are a proven installation method for FTTH.

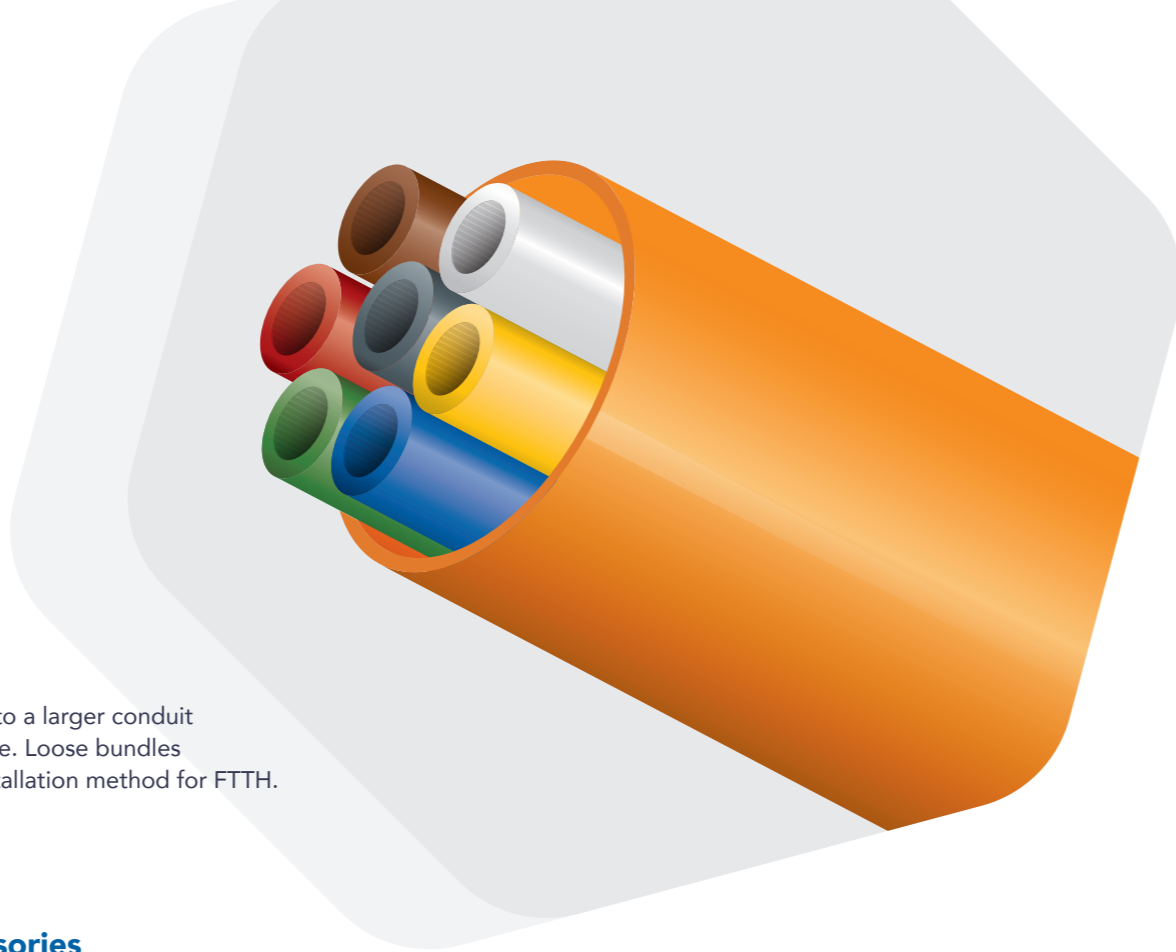
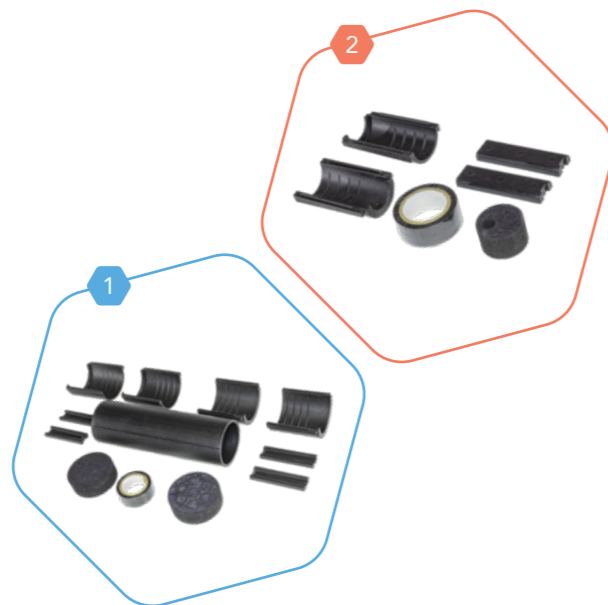
Technical Features:

- Flexible network configuration – combinations on request
- Highly impact resistant for protection of MicroDucts
- Best cable jetting performance
- Effectively utilizes duct space – higher fill ratio compared to jetting on site
- Future proof solution – main duct filling can be re-configured
- Pressure resistance minimum 15 bar
- SILICORE® or SILICORE® ULF, permanently lubricated inner lining provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Stiff construction to prevent undulations of MicroDucts resulting in longer blowing distances

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

- 1 DuraMulti MicroDuct Seal
- 2 DuraPack MicroDuct Seal



Standard DuraPack Configurations

DuraOpto (OD/ID mm)	MicroDucts (OD/ID mm)	Configuration (# of MicroDucts)	Drum Dimensions (cm) (height x core x width)	Length per Drum (m)	Total Weight (Drum + Conduit) kg
50/43	14/12	5	240x140x100	1000	1075
50/43	12/10	7	240x140x100	1000	1100
50/43	10/8	10	240x140x100	1000	1145
50/43	7/5,5	14	240x140x100	1000	1071
50/40,8	12/10	7	240x140x100	1000	1264
50/40,8	10/8	7	240x140x100	1000	1222
50/40,8	7/5,5	12	240x140x100	1000	1244
50/40,8	5/3,5	24	240x140x100	1000	1262
40/34	12/10	5	240x140x100	1500	1285
40/34	10/8	7	240x140x100	1500	1164
40/34	7/5,5	12	240x140x100	1500	1135
40/34	5/3,5	24	240x140x100	1500	1222
40/33	12/10	4	240x140x100	1500	1165
40/33	10/8	7	240x140x100	1500	1190
40/33	7/5,5	10	240x140x100	1500	1133
40/33	5/3,5	19	240x140x100	1500	1233
32/28	12/10	3	240x120x100	2750	1205
32/28	10/8	4	240x120x100	2750	1114
32/28	5/3,5	19	240x120x100	2750	1312
32/26	10/8	3	240x120x100	2750	1268
32/26	7/5,5	8	240x120x100	2750	1353
32/26	5/3,5	12	240x120x100	2750	1310
25/21	5/3,5	7	225x90x100	4000	1128
25/20	7/5,5	4	225x90x100	4000	1196
25/20	5/3,5	4	225x90x100	4000	1138

More dimensions on customer request possible

DuraDrill

DuraDrill ducting is designed for the most demanding applications with an extra thick jacket to protect the Direct Bury (DB) MicroDucts inside. DuraDrill is ideal for demanding pulling applications requiring a very high tensile strength.

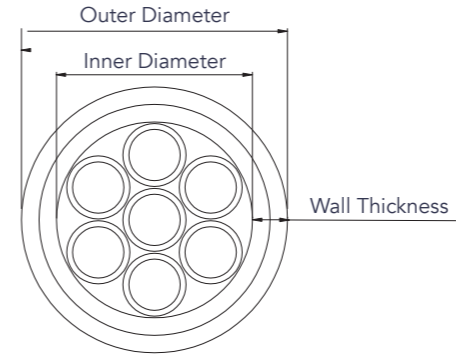
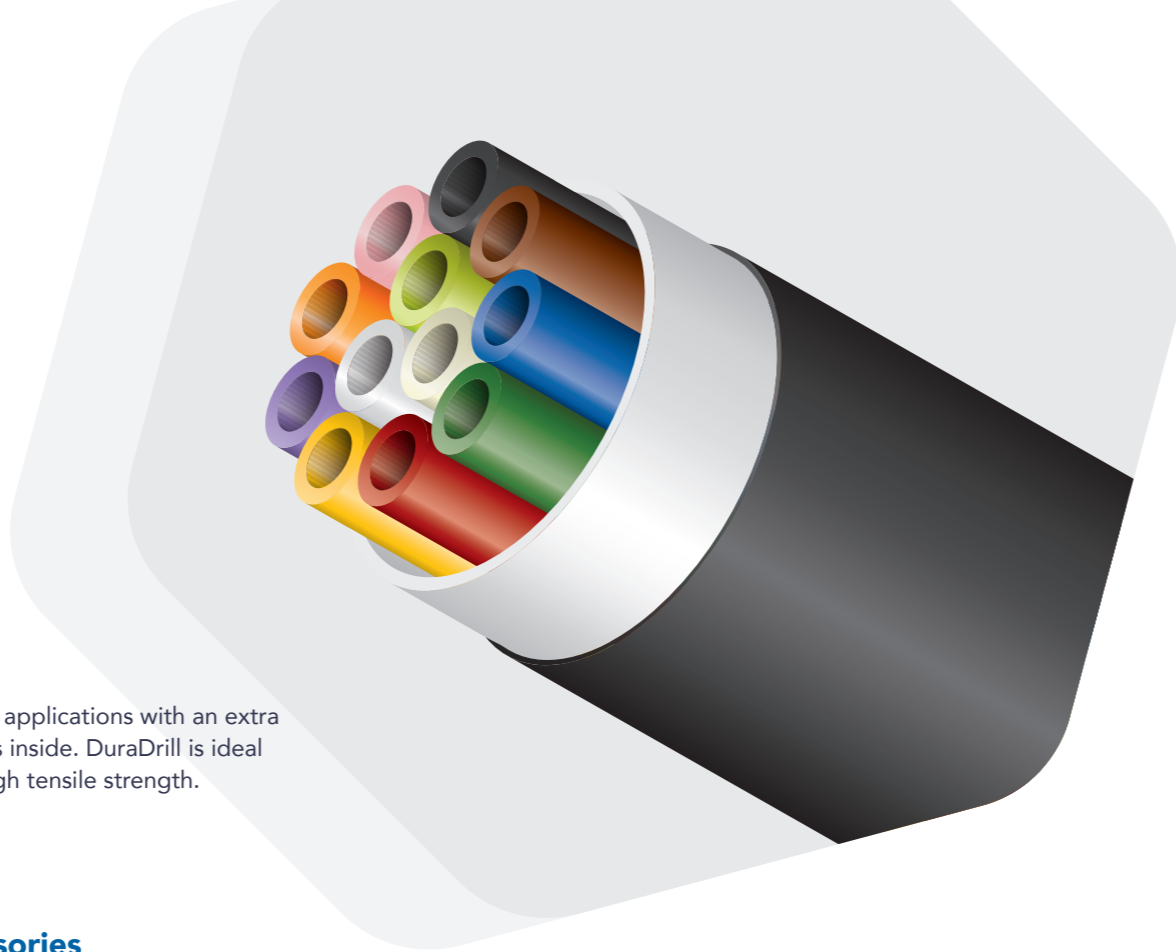
Technical Features:

- MicroDucts and outer jacket made from HDPE, inner jacket from PP
- High tensile force of up to 19.000N
- Very high pulling resistance
- High scratch resistance during the pulling process
- Pressure resistance to 15 bar
- Stiff construction to prevent undulations of MicroDucts offering longer blowing distances

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

- 1 DuraGasblock Terminator
- 2 DuraFit Connector
- 3 DuraFit Endstop



DuraDrill Configurations

Configuration + Size (OD/ID mm)	Inner Diameter (mm)	Outer Diameter (mm)	Wall Thickness (mm)	Length (m)	Drum Dimensions (cm) (height x core x width)
3x12/8	25,9	31,9	3	1000	190x90x100
4x20/15	48,3	54,3	3	850	240x140x100
7x12/8	36	42	3	1600	240x120x100
12x10/6	40,6	46,6	3	1000	240x140x100
12x12/8	49	55	3	850	240x140x100
4x14/10	33,8	39,8	3	1500	240x140x100
7x14/10	42	48	3	1000	240x140x100



MicroDucts and FuturePath Figure-8 Aerial

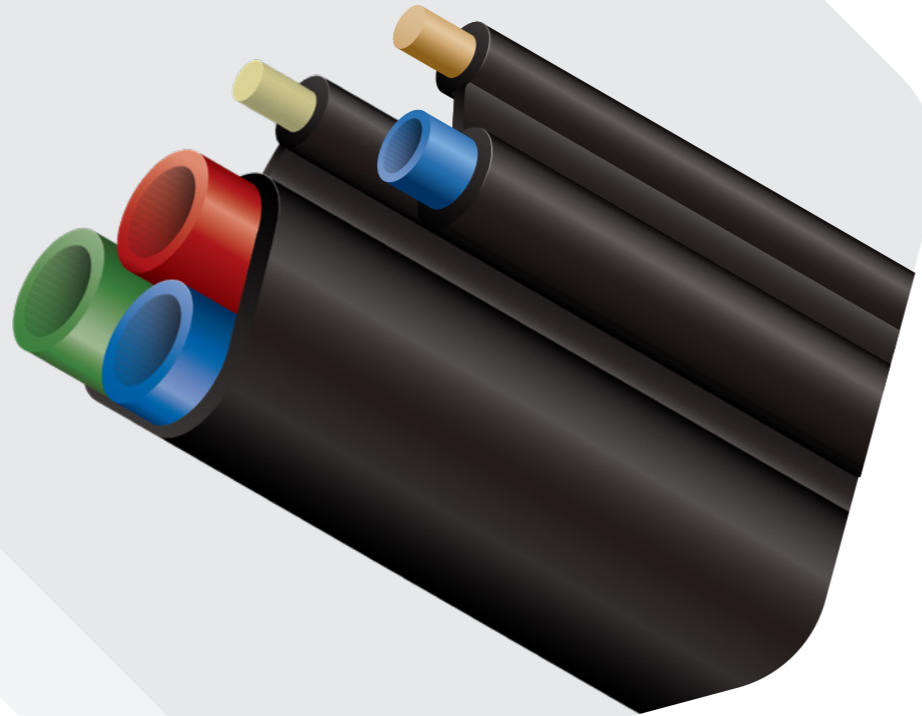


Figure-8 Aerial is a MicroDuct solution for aerial FTTH installations that provides a cost-effective, time-efficient alternative to direct-buried (DB) deployments, with no need for digging.

Technical Features:

- Quick and simple to deploy
- Standard aerial components and installation methods
- Completely metal-free – no grounding necessary
- Can be installed alongside power lines
- Minimal/no aerial splicing required
- Protects cables against extreme weather (snow, wind, and ice) and high UV resistance in Central European climactic conditions



MicroDucts and FuturePath Figure-8 Aerial Configurations

Configuration + Size (OD/ID mm)	Drum Dimension (cm) (height x core x width)	Length per Drum (m)	Total Weight (Drum + MicroDuct) kg
1x5/3.5 mm	90x40x60	2000	100
1x12/10 mm	103x40x60	1000	155
4x5/3.5mm	103x40x60	1000	160
2x12/10mm	122x40x70	1000	250
3x12/10mm	190x90x100	1000	500
4x12/10mm	190x90x100	1000	560
1x12/10mm + 12x5/3.5mm	190x90x100	1000	570

DuraOpto

Dura-Line's DuraOpto ducts are made from High Density Polyethylene (HDPE) and are lined with Dura-Line's SILICORE® permanently lubricated lining as standard.

DuraOpto ducts come ready for direct burial (DB) or with thinner walls for subduct installation (DI).

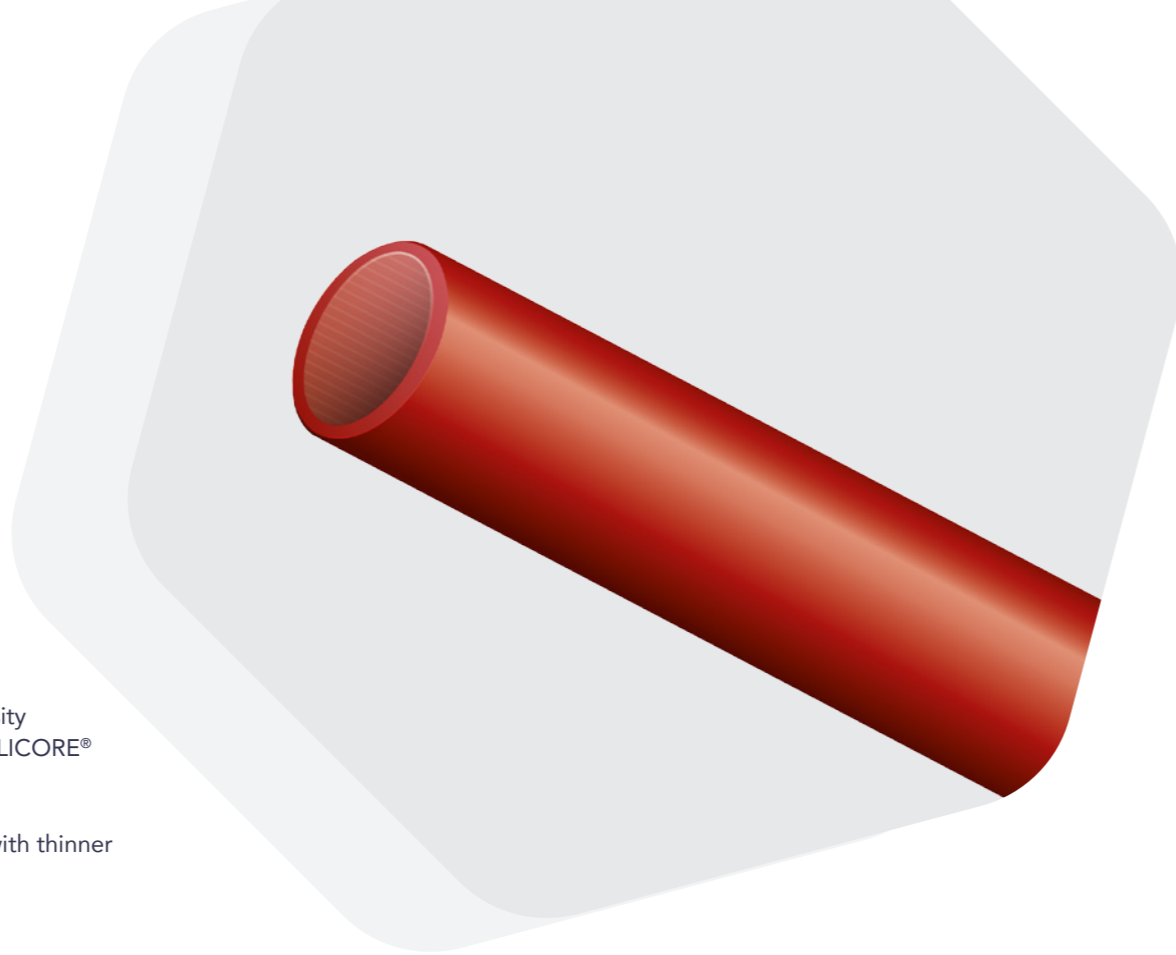
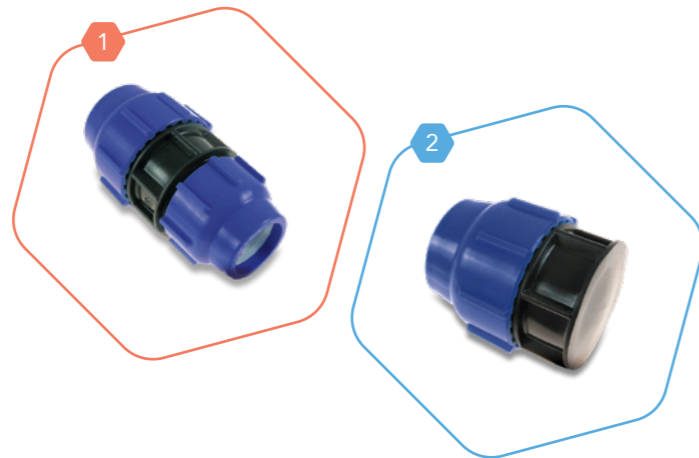
Key characteristics:

- Size from Ø 25 to 50 mm (Outer Diameter)
- SILICORE®, permanently lubricated inner lining provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Pressure resistance minimum 15 bar
- Available in 12 opaque RAL colours with or without stripes
- Can be delivered on segmented drums or coiled with several lengths on one drum

Accessories

Selected Accessories highlighted here, see complete overview in the accessories section

- 1 DuraOpto Connectors and Reducers
- 2 DuraOpto Endstops



DuraOpto Direct Install (DI)

DuraOpto (OD/ID mm)	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
25/21	150x67x60	1250	329
	190x90x100	3000	642
32/28	190x90x100	1750	614
	225x90x100	2750	931
40/34	190x90x100	1000	557
	225x90x100	1750	904
50/42,6	240x120x100	1000	863

DuraOpto Direct Bury (DB)

DuraOpto (OD/ID mm)	Drum Dimensions (cm) (height x core x width)	Length per drum (m)	Total Weight (Drum + Conduit) kg
25/20	150x67x60	1250	369
	190x90x100	3000	737
32/26,2	190x90x100	1750	671
	225x90x100	2750	1022
40/33	190x90x100	1000	609
	225x90x100	1750	995
50/40,8	240x120x100	1000	979

Core Range Accessories



Connectors

Make connections between MicroDucts quickly and easily, without the need for tools.

- Gas and water-tight connections
- Meet or exceed requirements of EN 50411-2-8:2009 standard for MicroDuct connectors, for air-blown optical fibres
- Working pressure: 15 bar
- Burst pressure: 25 bar
- Impact resistance: 1 joule (5 joules with cover)
- Designed for an operational lifetime of 25+ years

Material Description	Packaging (Pieces)
DuraFit Connector 4 mm	100
DuraFit Connector 5 mm	100
DuraFit Connector 7 mm	100
DuraFit Connector 8 mm	100
DuraFit Connector 10 mm	100
DuraFit Connector 12 mm	100
DuraFit Connector 14 mm	100
DuraFit Connector 16 mm	100
DuraFit Connector 18 mm	100
DuraFit Connector 20 mm	100
DuraFit Connector 7 mm with cover	100
DuraFit Connector 8 mm with cover	100
DuraFit Connector 10 mm with cover	100
DuraFit Connector 12 mm with cover	100
DuraFit Connector 14 mm with cover	100
DuraFit Connector 16 mm with cover	100
DuraFit Connector 18 mm with cover	100
DuraFit Connector 20 mm with cover	100
Metal-free connectors available upon request	

Reducers

Make connections between MicroDucts of different sizes quickly and easily without, the need for tools.

- Gas and water-tight connections
- Working pressure: 15 bar
- Burst pressure: 25 bar
- Impact resistance: 1 joule
- Meet or exceed requirements of EN 50411-2-8:2009 standard for MicroDuct connectors, for air-blown optical fibres
- Designed for an operational lifetime of 25+ years



Material Description	Packaging (Pieces)
DuraFit Reducer 7 mm to 5 mm	100
DuraFit Reducer 10 mm to 7 mm	100
DuraFit Reducer 10 mm to 8 mm	100
DuraFit Reducer 12 mm to 10 mm	100
DuraFit Reducer 14 mm to 10 mm	100
DuraFit Reducer 14 mm to 12 mm	100
DuraFit Reducer 16 mm to 14 mm	100
More sizes available upon request	
Metal-free reducers available upon request	

End Stops

Provide a gas and water-tight seal of a MicroDuct pathway, to prevent moisture or debris from entering the duct.

- Burst pressure: 25 bar
- Impact resistance: 1 joule (5 joules with cover)
- Meet or exceed requirements of EN 50411-2-8:2009 standard for MicroDuct connectors, for air-blown optical fibres
- Designed for an operational lifetime of 25+ years



Material Description	Packaging (Pieces)
DuraEnd Stop 4 mm	100
DuraEnd Stop 5 mm	100
DuraEnd Stop 7 mm	100
DuraEnd Stop 8 mm	100
DuraEnd Stop 10 mm	100
DuraEnd Stop 12 mm	100
DuraEnd Stop 14 mm	100
DuraEnd Stop 16 mm	100
DuraEnd Stop 18 mm	100
DuraEnd Stop 20 mm	100
DuraEnd Stop with cover available upon request	
Metal-free end stops available upon request	

Gas Block Connectors

Provide an effective seal between a MicroDuct and an installed fibre-optic cable, to prevent gas or moisture from entering the duct.

- Burst pressure: 25 bar
- Impact resistance: 1 joule
- Meet or exceed requirements of EN 50411-2-8:2009 standard for MicroDuct connectors, for air-blown optical fibres
- Designed for an operational lifetime of 25+ years
- Multiple sizes available for use with different cable diameters. Please state cable diameter when ordering this product.



Material Description	Packaging (Pieces)
DuraGasBlock Connector 5 mm	25
DuraGasBlock Connector 7 mm	25
DuraGasBlock Connector 10 mm	25
DuraGasBlock Connector 12 mm	25
DuraGasBlock Connector 14 mm	25
DuraGasBlock Connector 16 mm	25
More sizes available upon request	

Core Range Accessories

Gas Block Terminators

Provide an easy gas and watertight seal of a MicroDuct pathway with existing cables inside.

1 DuraGasBlock Terminator

- Divisible gas and water seal: 0.5 bar
- Impact resistance: 3 joules
- Meet or exceed requirements of EN 50411-2-8:2009 standard for MicroDuct connectors, for air-blown optical fibres
- Designed for an operational lifetime of 25+ years
- Multiple sizes available for use with different cable diameters. Please state cable diameter when ordering this product.



Material Description	Packaging (Pieces)
DuraGasBlock Terminator 10 mm	25
DuraGasBlock Terminator 12 mm	25
DuraGasBlock Terminator 14 mm	25
DuraGasBlock Terminator 16 mm	25
DuraGasBlock Terminator 18 mm	25
DuraGasBlock Terminator 20 mm	25
DuraGasBlock Terminator Nano 4 mm	100
DuraGasBlock Terminator Nano 5 mm	100
DuraGasBlock Terminator Nano 6 mm	100
DuraGasBlock Terminator Nano 7 mm	100
DuraGasBlock Terminator Nano 8 mm	100

2 Divisible GasBlock Termination

- Made from premium aluminium materials
- Gas and water seal: up to 10 bar (permanent)
- Multiple sizes available for use with different cable diameters. Please state cable diameter when ordering this product.



Material Description	Packaging (Pieces)
Divisible GasBlock Termination 5/3.5 mm	10
Divisible GasBlock Termination 7/4 mm	10
Divisible GasBlock Termination 10/8 mm	10
Divisible GasBlock Termination 12/8 mm	10
Divisible GasBlock Termination 14/10 mm	10
Divisible GasBlock Termination 16/12 mm	10

3 GasBlock ALU

- Made from premium aluminum materials
- Gas and water seal: more than 5 bar (permanent)
- Multiple sizes available for use with different cable diameters. Please state cable diameter when ordering this product.



Material Description	Packaging (Pieces)
GasBlock ALU 5/3.5 mm	10
GasBlock ALU 7/4 mm	10
GasBlock ALU 10/8 mm	10
GasBlock ALU 12/8 mm	10
GasBlock ALU 14/10 mm	10
GasBlock ALU 16/12 mm	10
More sizes available upon request	

Divisible Duct Seal

Used to seal a MicroDuct following a mid-span cable installation, or to repair a damaged section of a MicroDuct, with or without pre-installed fibres.

- A small connector provides an initial gas and water seal directly around the cable before the mid-span duct seal is applied to secure the MicroDuct
- Gas and water seal: 0.5 bar
- Designed for an operational lifetime of 25+ years



House Lead-Ins

Provide an effective seal around a MicroDuct at the entry point to a premise, to prevent gas or moisture from entering the duct.

- Gas and water seal: up to 2 bar
- Multiple sizes available for use with different cable diameters. Please state cable diameter when ordering this product.



Material Description	Packaging (Pieces)
Divisible Duct Repair Kit 5 mm	10
Divisible Duct Repair Kit 7 mm	10
Divisible Duct Repair Kit 8 mm	10
Divisible Duct Repair Kit 10 mm	10
Divisible Duct Repair Kit 12 mm	10
Divisible Duct Repair Kit 14 mm	10
Divisible Duct Repair Kit 10 mm Gas - waterstop 0.5 bar to the cable	10
Divisible Duct Repair Kit 12 mm Gas - waterstop 0.5 bar to the cable	10
Divisible Duct Repair Kit 14 mm Gas - waterstop 0.5 bar to the cable	10
Divisible Duct Repair Kit 16 mm Gas - waterstop 0.5 bar to the cable	10
Divisible Duct Repair Kit 20 mm Gas - waterstop 0.5 bar to the cable	10

Material Description	Packaging (Pieces)
House lead-in overground 4-8 mm pipe	1
House lead-in overground 10-12 mm pipe	1
House lead-in underground 4-8 mm pipe	1
House lead-in underground 10-12 mm pipe	1

The full range of accessories is available on our website: www.duraline-europe.com

Product Customization

Our standard configurations/variations are based on our standard colours, stripes and marking. Other configurations may be available on request.

In addition to products manufactured from HDPE, we offer fire-rated LSHF materials and materials resistant to damage from rodents. Duct inner layers can be ribbed or smooth.

Technical Features:

As standard all Dura-Line products are:

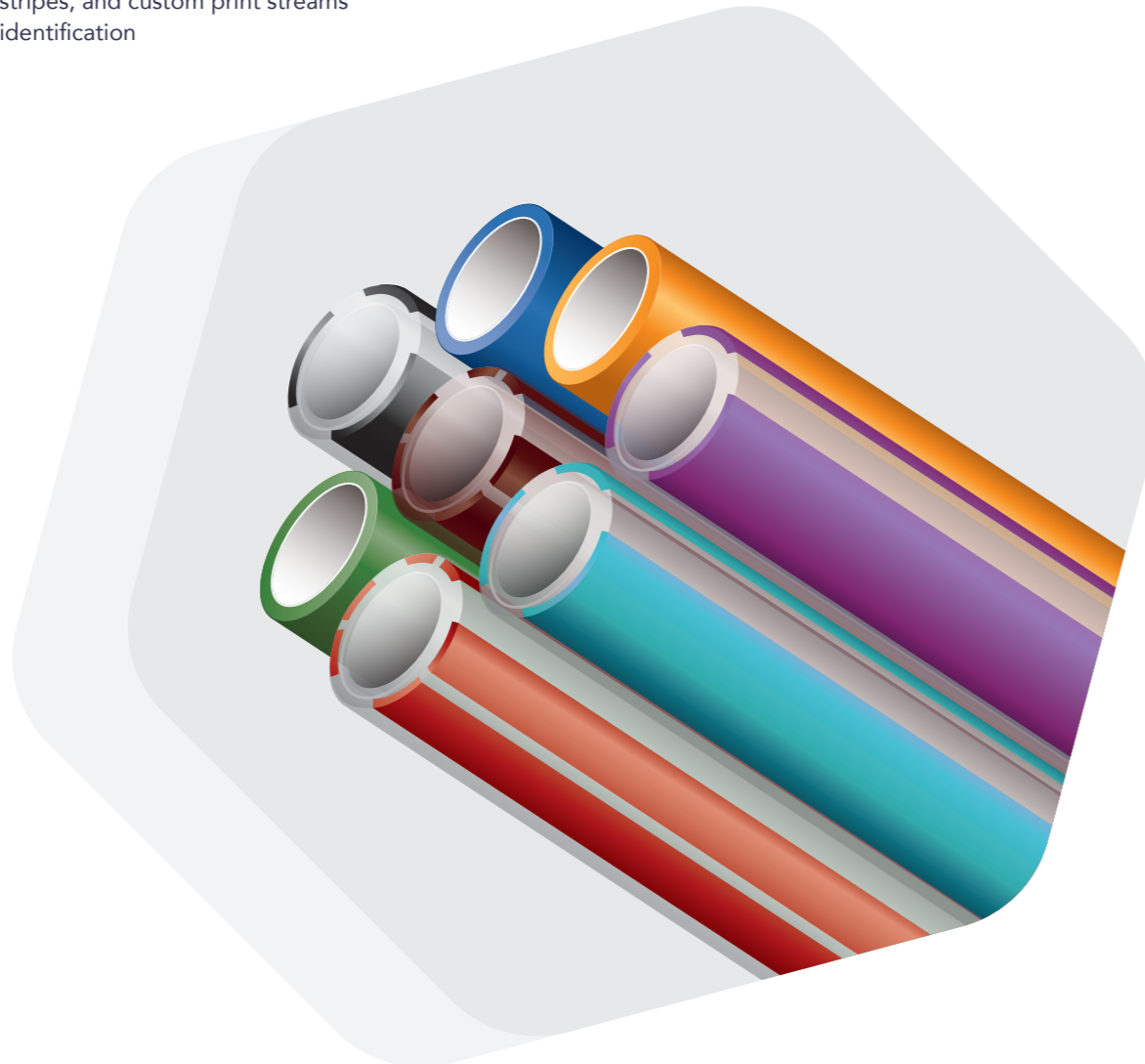
- Made from high quality virgin HDPE
- Highly Pressure resistance: suitable for air or water jetting
- Manufactured with a low friction coefficient (<0.1) for maximum cable installation distance

Custom Product Markings

All Dura-Line conduits and MicroDucts can be manufactured in a variety of colours, stripes, and custom print streams for easy identification

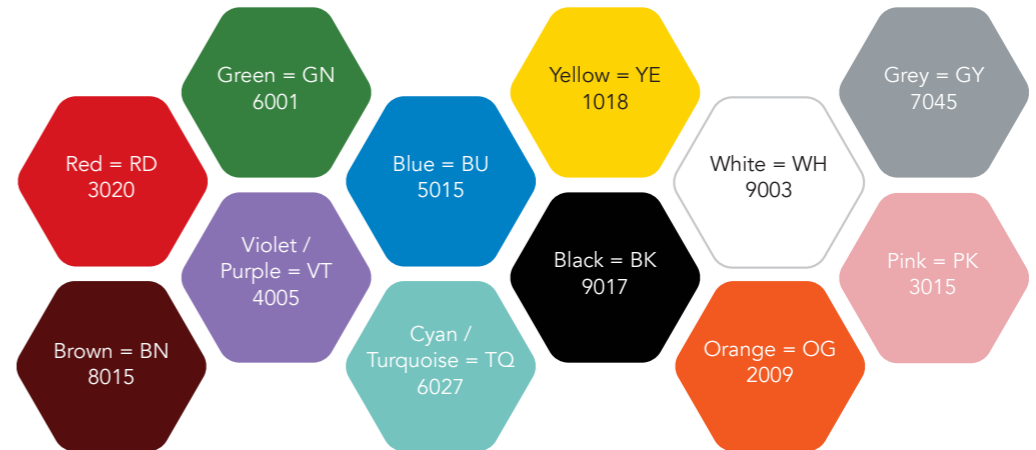
Additional Customization:

- Smooth or Ribbed Lining
- SILICORE® or SILICORE® ULF
- Pulling Rope
- Antistatic
- Anti-Rodent
- Flame-retardant
- UV stabilized for short or long term
- Packaging



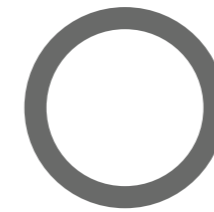
Colour Coding

Our standard range of 12 RAL coded colours include:

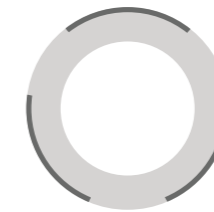


Colour Combination Options

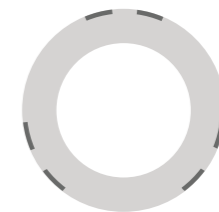
Various configurations of colour coding are available: fully opaque or colourless with stripes.



Opaque



Colourless + 3 wide stripes



Colourless + 6 thin stripes

Marking

Standard marking is as follows and can be customised on request:

For MicroDucts:

Metrication - Dura-Line - Batch Number - Product name - Type of installation - OD/ID - Silicore (optional) - Production date <YYYY/MM/DD>

For FuturePath Products:

Metrication - Dura-Line - Batch Number - Product name - Y(way)xOD/ID - Production date <YYYY/MM/DD>

Packaging Configurations



Dura-Line is committed to doing our part to reduce our impact on the environment. One of the ways we're doing this is through our Drum Return program, which allows us to reuse the drums after you return them. By working together to reduce our consumption, we can conserve resources and support our shared Zero Waste to Landfill commitment.

To accomplish this together, we ask that you return the undamaged drums to us within six months after delivery. Full guidance on acceptable conditions and transportation of returned drums can be found in the document "Wooden Drums – Quality Acceptance Criteria".

Packaging

We offer a range of packaging options for efficient transport and ease of use including plywood drum (HPD drums) and wooden drums (HWD drums).

Our standard drum dimensions are listed below:

Drum Dimensions (cm) (height x core x width)	Weight of Drum (kg)	Drums per Truckload
60x40x47	6	352
120x46x35	21	110
120x52x50	82	88
150x60x67	150	27
190x90x100	212	14
225x90x100	300	12
240x120x100	330	10
240x140x100	385	10

* Other dimensions may be available on request.

Storing and transport instructions

Drums must be stored safely as improper storage can cause damage to drums and their contents.

- Manipulation of drums (e.g. rollover) must be done with appropriate equipment
- Always keep the duct protected against UV radiation.
- Duct ends must be sealed to protect against ingress of moisture and debris.
- Wooden drums can be stored outside subject to product data sheet instructions (including temperature range and storage conditions)
- Standard temperature range for HDPE products ranges – 40 °C to +60 °C
- Plywood drums must be stored indoors

Drums should only be transported with approved vehicles. All drums must be securely fastened during transportation to prevent injury or damage to the product. Wedges, supports and tie-downs can be used to secure drums, fastening sideways from the highest point. Ensure loading follows proper weight and balance for the vehicle.

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**Connectivity
Solutions**

