dura-line

An Orbia Connectivity Solutions business.

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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CREATING WHAT CONNECTS US

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

INDUSTRY EXPERTISE

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.

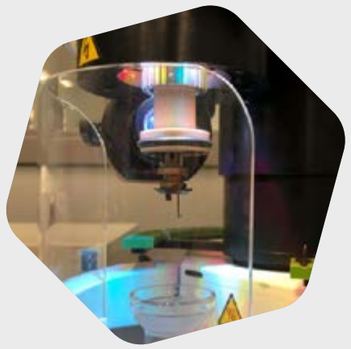
21 Plants

3 Research & Development Centers

4 Testing Facilities

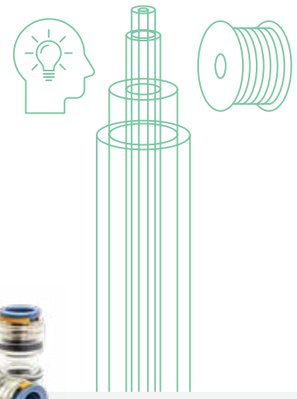
QUALITY FOCUS

Dura-Line is committed to quality. The company is certified according to international standards ISO 9001, ISO 14001 and ISO (OHSAS) 45001. 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 50+ year operational lifetime.



CUSTOMER PARTNERSHIPS

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.



ADVANCED PRODUCT PORTFOLIO

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 <0.1 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.

SOLUTION-LED APPROACH

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.

RESPONSIBLE MANUFACTURER

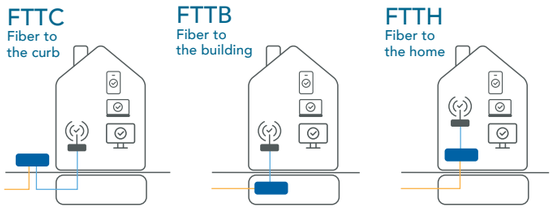
Zero-Waste-to-Landfill **Renewable Energy** **Material Regrind**

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

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

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

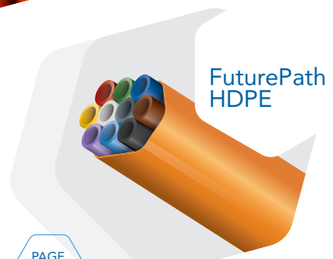
- Dimension Check – Measurement of the duct outer diameter, wall thickness and ovality.
- Yield Strength – Duct samples are pulled to their yield point, to detect any change in material composition.
- Crushing – Conduit is compressed to verify outer pressure resistance.
- Inner Friction – Confirmation 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.
- 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.

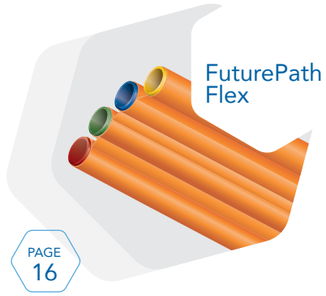
- Innovative and sustainable product range
- Flexible and suitable for various applications and installation techniques
- Quality confirmed by stringent internal tests and external certification
- Choice of material including HDPE, reground HDPE, fire-retardant, antirodent, antistatic
- Solutions for 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 new direct buried pathways
- 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

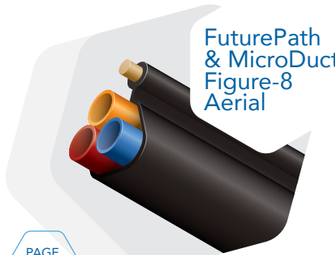


Pre-configured flat MicroDuct bundles
- Ideal for micro-trenching
- Minimizes installation cost and time
- Eliminates crossed duct pinch-points
- Highly flexible during installation

Pre-configured MicroDuct bundles
- Ideal for override
- 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
- Stiff Construction 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

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Best-in-class fire performance and halogen free

- Made from quality flame retardant materials for use in in-building applications, formulated for long life expectancy
- Tested in accordance with EN 13501-1 for reaction to fire and achieved best-in-class fire performance and smoke generation rating 'B s1 d0' for MicroDucts and 'C-s2, d2' for FuturePath when mounted on gypsum plasterboard
- Halogen free, tested in accordance with EN 50642

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Best-in-class fire performance and available in various colors

- Tested in accordance with EN 13501-1 for reaction to fire and achieved best-in-class fire performance and smoke generation rating 'B s1 d0' for MicroDucts and 'C-s2, d2' for FuturePath when mounted on gypsum plasterboard
- Available in 12 opaque RAL colors and natural, milky white color

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Easier handling, best-in-class fire performance and halogen free

- A bundle of LSHF MicroDucts joined by a thin web for easier handling in in-building applications
- Tested in accordance with EN 13501-1 for reaction to fire achieving a fire performance and smoke generation rating of 'C-s2, d0' when mounted on gypsum plasterboard
- Halogen free, tested in accordance with EN 50642

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Easier handling, best-in-class fire performance and various colors

- FuturePath Flex Fire Retardant is a bundle of MicroDucts joined by a thin web of fire-retardant HDPE for use in in-building applications
- Tested for reaction to fire in accordance with EN 13501-1, achieving performance rating of 'C-s2, d0' when mounted on gypsum plasterboard
- Available in 12 opaque RAL colors and natural, milky white color

Learn more about our product line, configurations and technical data:

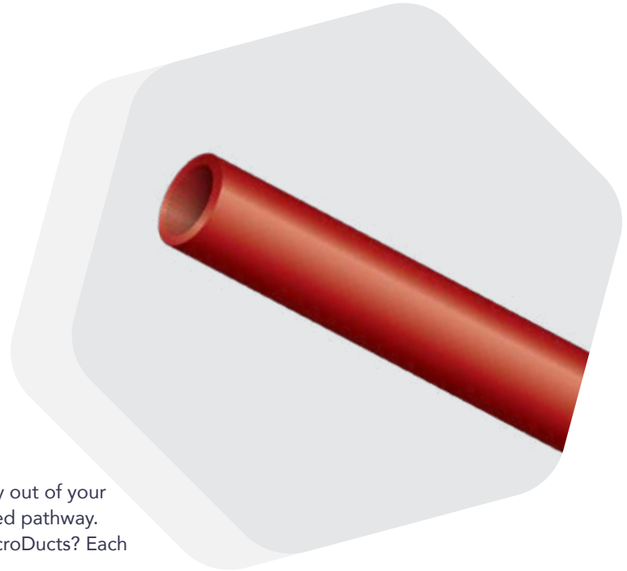
www.duraline-europe.com/en/micro-technology

Best-in-class fire performance for in-building communications networks

As we move towards an omni-connected world, high bandwidth and low latency are non-negotiables. Next-generation applications like the Metaverse, the Internet of Things (IoT), and driverless vehicles will rely on optical fibre everywhere – indoors as well as outdoors. But installing fibre in buildings, confined spaces, and mass transit corridors comes with unique deployment challenges and fire-safety considerations.

Low Smoke Halogen Free (LSHF) MicroDuct products and associated accessories are a flexible, scalable solution for in-building communications networks. Conforming to demanding European standards, Dura-Line's LSHF range offers best-in-class fire performance when tested on gypsum plasterboard to EN 13501-1 for safety and security in in-building FTTH, LAN, data center, and transport applications.

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:

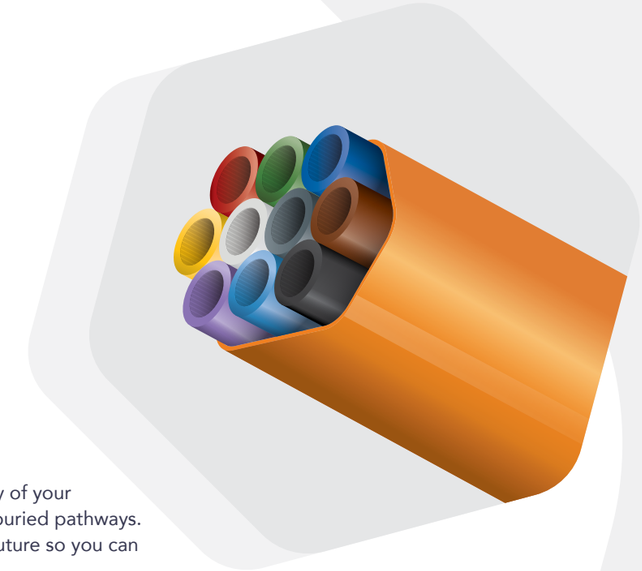
- Made from top quality HDPE (High Density Polyethylene)
- Internal low friction layer SILICORE® or SILICORE® ULF and internal ribs to maximize blowing performance
- Pressure resistance minimum 15 bar
- Available in 12 opaque RAL colours with or without identification stripes
- Available in natural colour 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

FuturePath HDPE



MicroDucts HDPE (DuraMicro HDPE) maximise the versatility of your existing conduit system and allow you to create new direct-buried pathways. Each MicroDuct provides a pathway for fibre now or in the future so you can expand your network as demand grows.

We offer MicroDucts HDPE in two variations: the MicroDucts HDPE DB (Direct Buried) range was created to withstand impact, and can be buried directly, while MicroDucts HDPE DI (Direct Install) are designed to be installed by pulling, blowing, or pushing into existing conduit systems. MicroDucts HDPE can be used in bundles, forming FuturePath HDPE (DuraMulti).

Technical Features:

- Made from high-density polyethylene (HDPE)
- Pressure resistance minimum 15 bar
- Available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Utilise extra space in an occupied conduit
- Revitalise existing networks with OverRides
- Substantially reduce construction costs & deployment time
- Available in 12 opaque RAL colours, with or without identification stripes
- Available in natural colour, with or without identification stripes
- Designed for a fill ratio between 50% and 75%

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 & 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

ECO

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

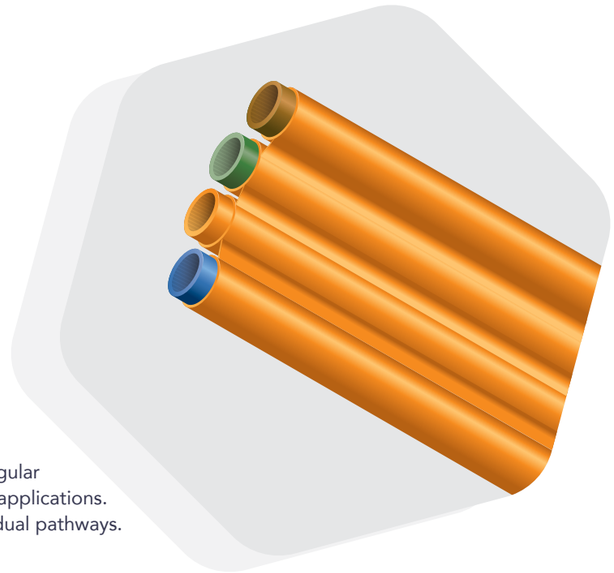
Whenever possible, we aim to collaborate with our customers to reach their Scope 3 emissions reduction targets. A comprehensive, third-party administered life cycle assessment (LCA) of the MicroDucts and FuturePath® ECO product range demonstrated a significant reduction in carbon emissions versus regular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



FuturePath Flex (DuraFlat) is a bundle of MicroDucts joined by a thin HDPE web. This unique structure allows the bundle to be installed flat or rolled/folded, making it easier to handle than regular bundles in narrow spaces, hard-to-reach locations, or long-haul applications. The thin web also enables easy separation and routing of individual pathways.

Technical Features:

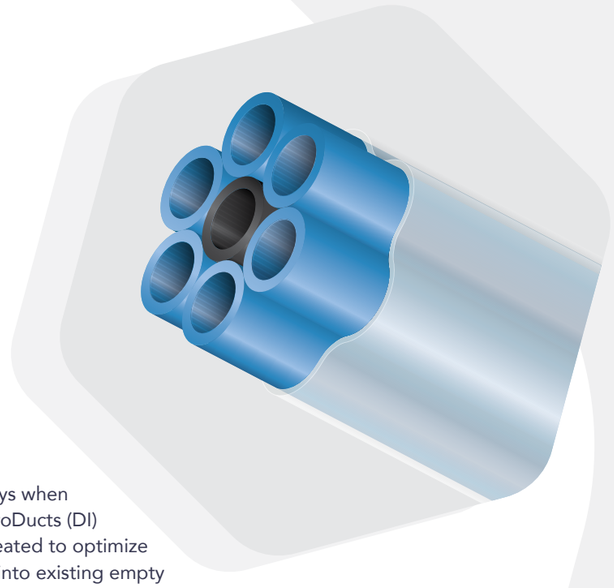
- Cost-effective – multiple pathways for one installation cost
- Can be placed inside existing pathways for subducting
- Easy-to-remove outer sheath provides access to individual pathways
- Individual MicroDucts available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Individual MicroDucts inside designed for an optimal fill ratio between a minimum of 50% and a maximum of 75%

Accessories

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

1 DuraGasblock Terminator
2 DuraFit Connector
3 DuraFit Endstop

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:

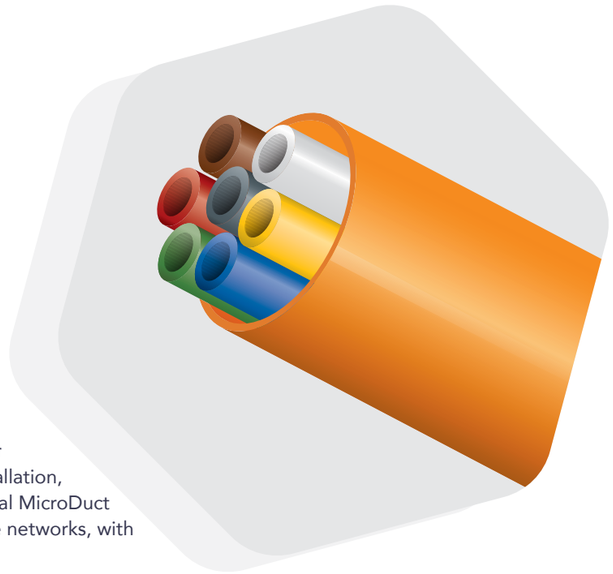
- Made from HDPE (High Density Polyethylene)
- Pressure resistance up to 15 bar
- High-quality materials formulated for long-life expectancy
- Thin outer sheet for compact construction
- Inner friction of MicroDucts < 0,1
- Long blowing distances at optimal fill ratio of 80%
- During installation, no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

Accessories

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

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

DuraPack



DuraPack features MicroDucts HDPE factory-installed in a larger standard conduit to enable efficient one-step underground installation, with increased stiffness and robustness compared with traditional MicroDuct bundles. DuraPack provides a flexible, scalable solution for fibre networks, with easy routing and dig-free future capacity upgrades.

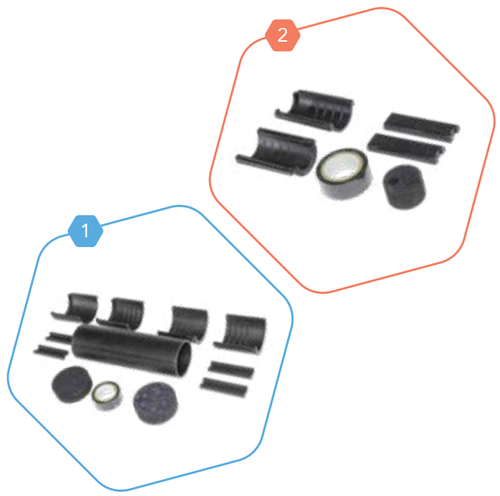
Technical Features:

- High-Density Polyethylene (HDPE) MicroDucts and standard conduit
- Cost-effective - multiple pathways for one installation cost
- Pressure resistance minimum 15 bar
- Individual MicroDucts available with SILICORE®, a permanently lubricated, co-extruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Stiff construction prevents undulation in loose MicroDucts which can impact jetting performance
- Available in 12 opaque RAL colours with or without identification stripes
- Individual MicroDucts designed for a fill ratio between a minimum of 50% and a maximum of 75%

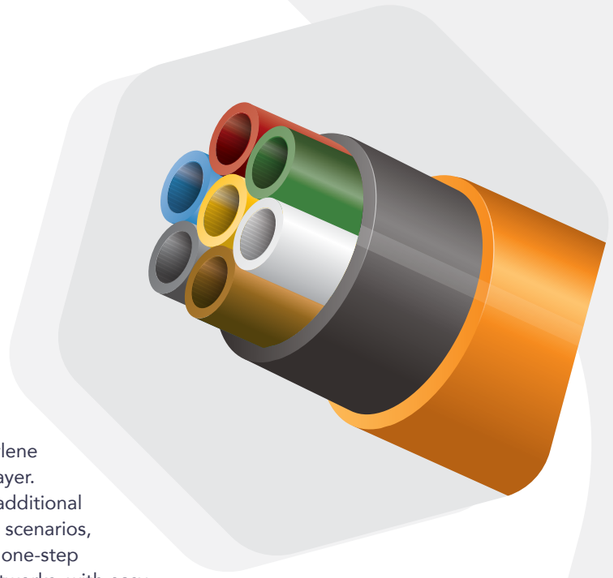
Accessories

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

1 DuraMulti MicroDuct Seal
2 DuraPack MicroDuct Seal



DuraDrill



DuraDrill features MicroDucts HDPE surrounded by a Polypropylene (PP) inner layer and a High-Density Polyethylene (HDPE) outer layer. This extra-rugged construction provides high pulling force and additional protection for the internal MicroDucts in demanding installation scenarios, including direct burial and directional drilling. DuraDrill enables one-step installation and provides a flexible, scalable solution for fiber networks, with easy routing and dig-free future capacity upgrades.

Technical Features:

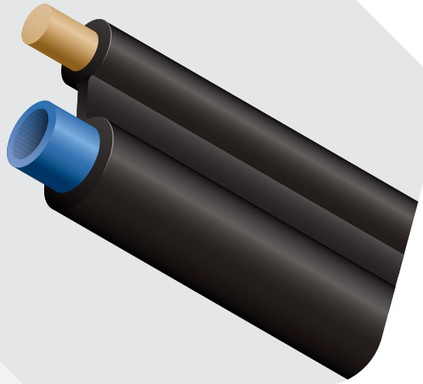
- High-Density Polyethylene (HDPE) MicroDucts surrounded by a Polypropylene inner layer and a High-Density Polyethylene (HDPE) outer layer.
- Extra-rugged, multi-layer construction
- Very high pulling force with excellent scratch resistance during installation
- Cost-effective - multiple pathways for one installation cost
- Pressure resistance minimum 15 bar
- Individual MicroDucts inside the bundle available with SILICORE®, a permanently lubricated, co-extruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Stiff construction prevents undulation in MicroDucts, which can impact jetting performance
- Available in 12 opaque RAL colours with or without identification stripes
- Individual MicroDucts designed for a fill ratio between a minimum of 50% and a maximum of 75%

Accessories

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

1 DuraGasblock Terminator
2 DuraFit Connector
3 DuraFit Endstop

MicroDucts Figure-8 Aerial

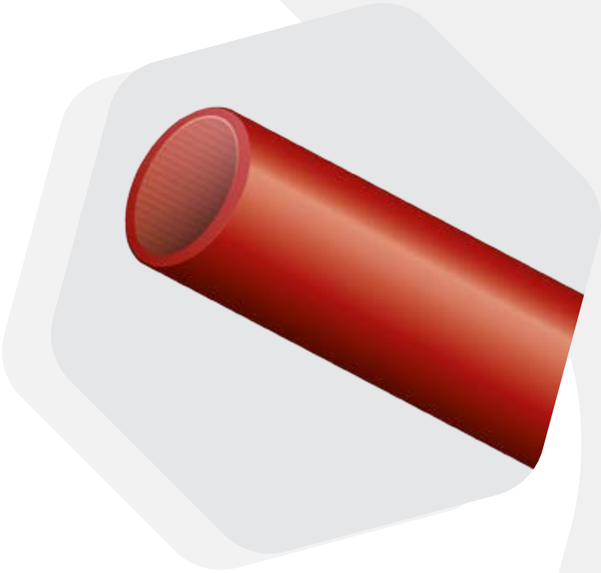


MicroDucts Figure-8 Aerial are a dieletric (non-metallic) self-supporting solution for aerial fibre distribution and drop connections in FTTH networks. They are particularly useful in places where subscriber density and/or terrain make direct burial cost prohibitive, e.g. rural and/or rocky areas. MicroDucts Figure-8 Aerial also provide a more future-proof alternative to stranded or lashed cable. The Figure-8 design removes the need for a separate messenger and the metal-free construction means the product can be attached to both telecom and power poles, alongside electrical cables without the need for grounding.

Technical Features:

- Completely metal free - can be installed alongside power lines without grounding
- Deployed quickly and easily with common aerial strand hardware
- No expensive digging
- Protects cables against extreme weather (e.g. snow, wind, and ice) and UV light
- Available with a black oversheath only, UV stabilized for up to 15 years in Central European climatic conditions
- MicroDucts available in 12 opaque RAL colors, UV stabilized for up to 2 years in Central European climatic conditions
- Enables end-to-end cable jetting with minimal splicing and no mid-span access required
- Available with SILICORE®, a permanently lubricated, co-extruded inner lining that
- provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Designed for an optimal fill ratio between a minimum of 50% and a maximum of 75%

DuraOpto



Our DuraOpto conduit is made from top quality virgin High Density Polyethylene (HDPE) materials. We offer DuraOpto in two variations: DuraOpto DB (Direct Buried) can withstand impact and is ideal for direct-buried installations, while DuraOpto DI (Direct Install) is designed to be installed by pulling, blowing, or pushing into existing conduit systems.

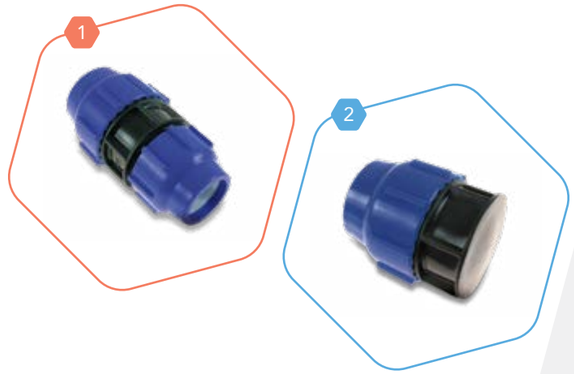
Key characteristics:

- Made from High Density Polyethylene (HDPE)
- Available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Available in 12 opaque RAL colours with or without stripes

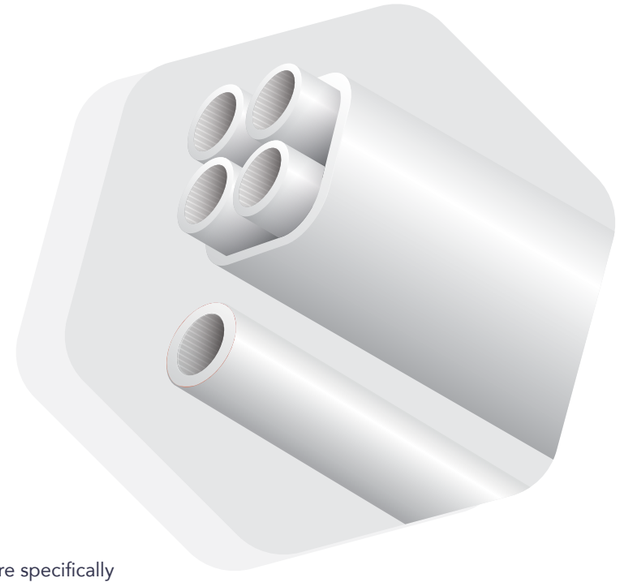
Accessories

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

1 DuraOpto Connectors and Reducers
2 DuraOpto Endstops



MicroDucts & FuturePath LSHF



MicroDucts and FuturePath LSHF (Low Smoke Halogen Free) are specifically designed for in-building applications where fire, smoke, and toxic fumes may pose a risk to human life and critical electronic equipment.

Tested to stringent European standards, MicroDucts and FuturePath LSHF offer best-in-class fire performance when tested to EN 13501-1. Once installed, they enable seamless, cost-effective moves, adds, and changes (MACs) and end-to-end fibre jetting in indoor FTTH, LAN, data centre, and transportation networks.

Key characteristics:

- Made from quality flame retardant materials, formulated for long life expectancy
- Tested in accordance with EN 13501-1 for reaction to fire and achieved best-in-class fire performance and smoke generation rating 'B s1 d0' when mounted on gypsum plasterboard
- Halogen free, tested in accordance with EN 50642
- MicroDucts LSHF are tested by respected German test institute VDE and marked in accordance with EN IEC 61386-22 (VDE 0605-22):2021-12; EN IEC 61386-22:2021+A11:2021. Production is regularly audited by VDE.
- Available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Available in natural, milky white color
- Designed for a fill ratio between a minimum of 50% and a maximum of 75%

Accessories

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

1 Micro Connectors Fire Retardant
2 Micro Reducers Fire Retardant
3 Micro End Stop Fire Retardant

MicroDucts Fire Retardant

MicroDucts Fire Retardant provide miniaturised protective pathways for fibre optic cables in indoor communications networks. Designed for environments where concerns about fire safety are paramount, Microducts Fire Retardant offer best-in-class fire performance when tested to EN 13501-1.

Once installed, they enable seamless, cost-effective moves, adds, and changes (MACs) and end-to-end fibre jetting in indoor FTTH, LAN, data centre, and transportation networks.

Key characteristics:

- Made from quality flame retardant materials, formulated for long life expectancy
- Tested for reaction to fire in accordance with EN 13501-1 and achieved best-in-class fire performance rating 'B s1 d0' when mounted on gypsum plasterboard
- Available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length
- Designed for a fill ratio between a minimum of 50% and a maximum of 75%
- Available in 12 opaque RAL colors and natural, milky white color

Accessories

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

1 Micro Connectors Fire Retardant
2 Micro Reducers Fire Retardant
3 Micro End Stop Fire Retardant

FuturePath Fire Retardant

FuturePath LSHF (Low Smoke Halogen Free) provides multiple MicroDucts bundled into an easy-to-handle unit designed for future growth in in-building fibre networks. It is specifically designed for in-building applications where fire, smoke, and toxic fumes may pose a risk to human life and critical electronic equipment.

Once installed, it enables seamless, cost-effective moves, adds, and changes (MACs) and end-to-end fibre jetting in indoor FTTH, LAN, data centre, and transportation networks.

Key characteristics:

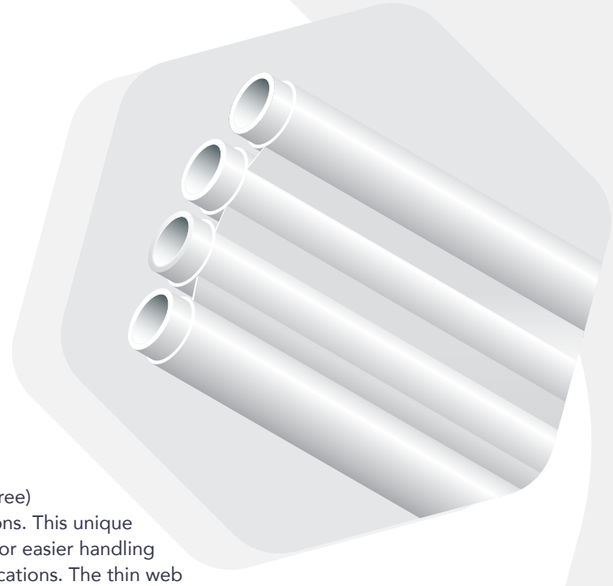
- Made from quality fire retardant materials, formulated for long life expectancy
- Tested for reaction to fire in accordance with EN 13501-1 and achieved fire performance rating 'C-s2, d2' when mounted on gypsum plasterboard
- Individual MicroDucts are available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower coefficient of friction (<0.1) for improved cable jetting performance
- Available in 12 opaque RAL colors
- Individual MicroDucts inside designed for an optimal fill ratio between a minimum of 50% and a maximum of 75%t

Accessories

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

1 Micro Connectors Fire Retardant
2 Micro Reducers Fire Retardant
3 Micro End Stop Fire Retardant

FuturePath Flex LSHF



FuturePath Flex LSHF is a bundle of LSHF (low smoke halogen free) MicroDucts joined by a thin web for use in in-building applications. This unique structure allows the bundle to be installed flat or rolled/folded for easier handling than regular bundles in narrow spaces or other hard-to-reach locations. The thin web also allows for easy separation and routing of individual pathways.

A more flexible, scalable alternative to direct-installed cable, indoor MicroDucts provide an additional physical layer of protection for cabling against fire or accidental cable cuts. They also allow building owners to accommodate moves, adds, and changes (MACs) more easily, with seamless, end-to-end cable jetting.

Key characteristics:

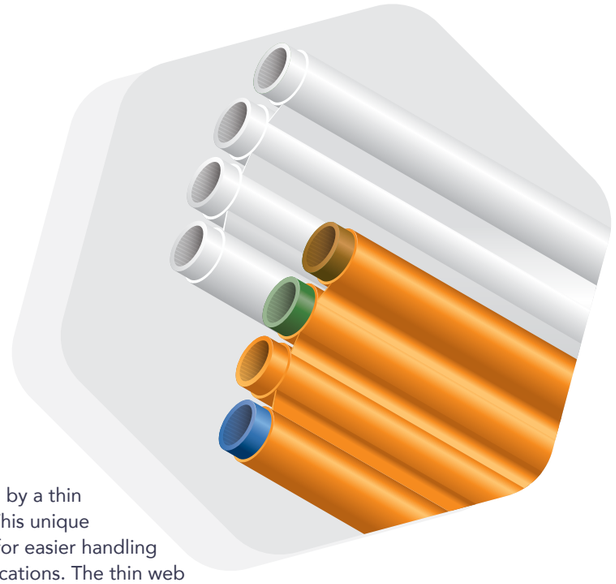
- Made from quality fire retardant materials, formulated for long life expectancy
- Tested in accordance with EN 13501-1 for reaction to fire achieving a fire performance and smoke generation rating of 'C-s2, d0' when mounted on gypsum plasterboard
- Halogen free, tested in accordance with EN 50642
- Individual MicroDucts LSHF are tested by respected German test institute VDE and marked in accordance with EN IEC 61386-22 (VDE 0605-22):2021-12; EN IEC 61386-22:2021+A11:2021. Production is regularly audited by VDE.
- Individual MicroDucts are available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower coefficient of friction (<0.1) for improved cable jetting performance
- Available in natural, milky white color
- Individual MicroDucts inside designed for an optimal fill ratio range of 50-75%

Accessories

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

1 Micro Connectors Fire Retardant
2 Micro Reducers Fire Retardant
3 Micro End Stop Fire Retardant

FuturePath Flex Fire Retardant



FuturePath Flex Fire Retardant is a bundle of MicroDucts joined by a thin web of fire-retardant HDPE for use in in-building applications. This unique structure allows the bundle to be installed flat or rolled/folded for easier handling than regular bundles in narrow spaces or other hard-to-reach locations. The thin web also allows for easy separation and routing of individual pathways.

A more flexible, scalable alternative to direct-installed cable, indoor MicroDucts provide an additional physical layer of protection for cabling against fire or accidental cable cuts. They also allow building owners to accommodate moves, adds, and changes (MACs) more easily, with seamless, end-to-end cable jetting.

Key characteristics:

- Made from quality fire retardant materials, formulated for long life expectancy
- Tested for reaction to fire in accordance with EN 13501-1, achieving performance rating of 'C-s2, d0' when mounted on gypsum plasterboard
- Individual MicroDucts are available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower coefficient of friction (<0.1) for improved cable jetting performance
- Available in 12 opaque RAL colors and natural, milky white color
- Individual MicroDucts designed for an optimal fill ratio range of 50-75%

Accessories

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

1 Micro Connectors Fire Retardant
2 Micro Reducers Fire Retardant
3 Micro End Stop Fire Retardant

Core Range Accessories

DuraFit Connectors and Reducers

Make connections between MicroDucts quickly and easily without the need for tools. Transparent design affords greater control when connecting MicroDucts and enables visual confirmation of the presence of a cable. An optional cover provides increased impact resistance.

Features

- Gas- and water-tight connections
- Features a small bridge that ensures a minimal distance (0.5 mm) between MicroDucts for optimal jetting performance.
- 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 operational lifetime: 25+ years
- Metal free connectors available upon request

DuraEnd Cap

Used to temporarily seal MicroDuct ends during transportation or storage.

Features

- Easy application
- UV resistance: No
- Lifetime expectancy: 25 years

DuraEnd Stop

Provides a gas and water-tight seal of a MicroDuct pathway to prevent moisture or debris from entering the duct. An optional cover provides increased impact resistance.

Features

- 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 fibre cables
- Designed for operational lifetime: 25+ years
- Metal free end stops and stop covers available upon request

DuraMulti MicroDuct Seal

DuraMulti MicroDuct Seal is specifically designed to seal the ends of DuraMulti bundles inside the buildings or cabinets. Modular, fully splittable design.

Features

- Easy to use, splittable design
- Burst pressure: 0,25 bar
- UV ressistance: No
- Lifetime expectancy: 20 years

DuraPack MicroDuct Seal

Used to seal a sub-duct around a bundle of loose MicroDucts inside a standard duct following end- or mid-span access. Features a compact design and divisible structure and seal for easy installation around MicroDucts.

Features

- Gas and water tight up to 0,5 bar
- Compact design, easy installation
- Application temperatures: as from -15 °C
- More configurations available upon request

Core Range Accessories

Micro Connectors and Reducers Fire Retardant

Make connections between MicroDucts quickly and easily in in-building applications, without the need for tools. Transparent design affords greater control when connecting MicroDucts and enables visual confirmation of the presence of a cable.resistance.

Features

- UL94 V-0: flame resistance for in-building applications
- Fire performance rating C-s2, d0 in accordance with EN 13501-1

Micro End Stop Fire Retardant

Provides a gas and water-tight seal of a MicroDuct pathway to prevent moisture or debris from entering the duct. Delivered with a pre-installed safety clip.

Features

- UL94 V-0: flame resistance for in-building applications
- Fire performance rating C-s2, d0 in accordance with EN 13501-1

Metal-Free DuraEnd Stop

Provides a gas and water-tight seal of a MicroDuct pathway to prevent moisture or debris from entering the duct. Transparent design enables greater control of installation on MicroDuct end. Available with optional safety clips. Totally metal-free design.

Features

- Material: Clear Polyamide (PA) Metal-free design
- Operating pressure: 20 bar
- Operational lifetime: 25+ years

Metal-Free DuraFit Connectors and Reducers

Make connections between MicroDucts quickly and easily without the need for tools. Transparent design affords greater control when connecting MicroDucts and enables visual confirmation of the presence of a cable. Available with pre-installed safety clips. Totally metal-free design. Different products for DB and for DI applications.

Features

- Material: Clear Polyamide (PA)
- Metal-free design
- Installation pressure: 30 bar
- Operation pressure: 15 bar
- Operational lifetime: 25+ years

DuraGasblock Connector

Provides an effective seal between a MicroDuct and an installed cable to prevent gas, water or moisture from entering the duct. The connector creates a seal around the installed cable.

Features

- 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 fibre cables
- Designed for operational lifetime: 25+ years

DuraGasblock Terminator

Provides an effective gas and watertight seal of a MicroDuct pathway with an existing cable inside. Easy to mount on MicroDucts from 10 to 20 mm (outer diameter) and reusable.

Features

- 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 fibre cables
- Designed for operational lifetime: 25+ years

DuraGasblock Terminator Nano

Provides an effective gas and watertight seal of a MicroDuct pathway with an existing cable inside. Easy to mount on MicroDucts from 4 to 10 mm (outer diameter) and reusable.

Features

- 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 fibre cables
- Designed for operational lifetime: 25+ years

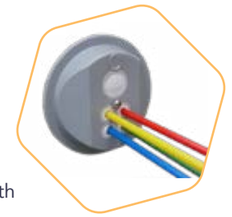
DuraHouse Lead-in Overground

DuraHouse Lead-In Overground is designed for gas- and water-tight sealing of a building entry point in FTTH applications. Suitable for use with up to 4 MicroDucts and cables.a seal around the installed cable.

Features

- Fire resistant
- Can safely bend a MicroDuct to 90 degrees
- UV resistance: Yes
- Operational lifetime: 25 years

DuraHouse Lead-in Underground



DuraHouse Lead-In Underground is designed for gas- and water-tight sealing of a building entry point in FTTH applications. Suitable for use with up to 4 MicroDucts and cables.

Features

- Burst pressure : 2bars
- UV resistance : Yes

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.

Features

- 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 operational lifetime: 25+ years

Core Range Accessories

Prelube 2000

Prelube 2000™ is a high-performance lubricant designed to coat the inner wall of a standard conduit prior to cable installation. This lubricant is proven to reduce frictional drag to increase installation speed, length, and safety in air-assisted installations. It is suitable for use with all types of communications cables and standard conduits and is available in quantities of 0.95, 3.8, and 18.9 litres.

Features

- Appearance: Slightly thickened, white liquid
- Viscosity: 5000-15000 cps @10 rpm pH: 6.5-8.0
- Shelf life: 24 months
- Temperature range: -5 up to 60

Prelube 5000

Prelube 5000™ is a high-performance lubricant specifically designed to coat the inner wall of a MicroDuct prior to air-assisted cable installation by blowing or jetting. This lubricant is proven to reduce frictional drag to increase installation speed, length, and safety. It is suitable for use with all types of cable jackets and is available in quantities of 240 and 470 ml.

Features

- Appearance: Slightly thickened, white liquid
- Viscosity: 2000-4000 cps @10rpm pH: 6.5-8.0
- Shelf life: 24 months
- Temperature range: -5 up to 60

MicroDuct Cutter, 5 – 14 mm

Designed to make a clean, straight cut in MicroDucts HDPE 5 – 14 mm in diameter.

Features

- Heat-treated stainless steel blade cuts through MicroDucts with ease.
- Made from polypropylene with thermoplastic rubber (TPR) for maximum grip and comfort.
- Safety clip keeps tool closed when not in use.
- Best suited for use with MicroDucts with a 1 mm wall thickness.

MicroDuct Cutter, 5 – 28 mm

Designed to make a clean, straight cut in MicroDucts HDPE 5 - 28 mm in diameter.

Features

- Triangular blade provides square and straight cuts by holding the MicroDuct in place.
- Spring-loaded jaws make the tool quick and easy to use.
- Carbon steel blade with black oxide finish is durable and easy to use.
- Safety lock keeps tool closed when not in use.
- Molded ribbed grips for comfort and security

360° Rotary Duct Cutter, 26 – 40 mm

Designed to ring HDPE or other similar conduits, this rotary duct and tube cutter is perfect for making circular without damaging the cables inside a conduit.

Features

- Makes circular cuts in conduits 26 - 40 mm in diameter.
- High carbon steel circular blades cut through HDPE or other similar materials with ease.
- Carbon steel construction provides high durability and long life.
- Ergonomic handle provides extra leverage during use.
- Replaceable blade.

360° Rotary Duct Cutter, 36 – 52 mm

Designed to ring HDPE or other similar conduits, this rotary duct and tube cutter is perfect for making circular without damaging the cables inside a conduit.

Features

- Makes circular cuts in conduits 36 – 52 mm in diameter
- High carbon steel circular blades cut through HDPE or other similar materials with ease
- Carbon steel construction provides high durability and long life
- Ergonomic handle provides extra leverage during use
- Replaceable blade

Duct Cutter, 20 – 64 mm

Designed to make a clean, straight cut in HDPE and other conduits 20 - 64 mm in diameter.

Features

- Ratcheting design provides a high degree of leverage to facilitate cutting with minimal user effort
- Triangular blade provides square and straight cuts by holding conduit in place
- Comfortable one-handed operation with easy open release
- Die cast aluminium alloy body and stainless-steel cutting blade provide long life and durability
- Safety latch on handle prevents accidental opening
- Blades can be sharpened with sharpening tool to maintain cutting performance
- Replaceable blade

Deburring Tool

Perfect for quickly deburring the inside of a MicroDuct, creating a beveled edge in preparation for termination.

Features

- S-shaped blade cleanly deburrs the edges and inside of the MicroDuct.
- Tempered HDD (high speed steel) provides maximum sharpness and durability.
- Ergonomic rubberized handle provides a secure and comfortable grip during use.

FuturePath Jacket Cutter

Designed with slim safety heads and high carbon steel blades, this cutter is perfect for slitting the jacket a FuturePath bundle to provide access the MicroDucts inside.

Features

- Unique slim head design gets in between the MicroDucts easily while preventing accidental nicks and cuts
- High carbon steel blade slides through FuturePath sheath with ease
- Thick handle for improved ergonomics and secure grip
- Large loop for storing on a belt, carabiner, or key ring

Pliers

Diagonal cutting pliers made of polished chrome vanadium steel, heat-treated for maximum strength and durability.

Features

- Induction-hardened cutting edge to provide a clean cut every time.
- Ergonomically designed handle with dipped plastic grip for greater comfort and torque.
- High-leverage design for superior cutting ability.
- Complies with ASME B107.11 and ISO 5749 standards.

Core Range Accessories

Ratchet Tool

Designed to make mid-span slits and window cuts in conduits greater than 25 mm in diameter.

Features

- Fixed jaws and ratcheting feature are perfect for making longitudinal mid-span slits in conduit.
- Replaceable double-ended blades have an adjustable cutting depth of 0 to 5 mm.
- Safety latch at the bottom of the handle prevents the tool from accidently opening.
- Blades can be sharpened with our sharpener to maintain cutting performance.

Universal Knife

Designed with a blade guard and replaceable straight blade, this insulated universal knife is perfect for cutting around jacketed cables without the risk of accidental cuts and nicks.

Features

- Insulated handle is rated for use on live equipment up to 1000V and is compliant with DIN EN 60900 VDE 0682-201:2013-04 standards
- Ultra-sharp stainless steel blades slide through cable jackets and can be replaced when worn out
- Blade guard can be folded into handle for slitting jackets
- Blade guard prevents accidental cuts
- Ergonomically designed handle for increase comfort and control

Tool Kit Essential

A collection of essential tools for use with conduit and MicroDucts in a convenient carry case.

Scoring Tool for MicroDucts

Designed for easy scoring and ringing of MicroDucts without damaging the cable inside.

Features

- Spring-loaded butterfly clip makes tool easy to open and position perfectly on MicroDucts
- Wide jaws curls around the MicroDducts, holding them in place while scoring
- Replacement blades available

Tool Case

A rugged and versatile 21 pocket tool case with a removable top, made from special heavy-duty material for greater durability and long life.

Features

- Reinforced with a tough, thick backing material to maintain its shape – even when loaded with tools
- Sturdy metal handle with a cushion grip and ergonomic design for easy carrying
- Handle rotates for easy access to tools inside
- Two Velcro® side straps for securing the case to a ladder
- Metal clip on the exterior for holding a tape measure
- Eleven pockets inside the case plus additional space for other tools
- Eight exterior pockets and one compartment with an elastic band
- Carrying strap

Tool Kit Plus

An extended selection of tools for use with conduit and MicroDucts in a convenient carry case.

Divisible GasBlock ALU Terminator

Provides an effective gas- and water-tight seal of a MicroDuct pathway with an existing cable inside. Easy to mount on MicroDucts from 5 to 20 mm (outer diameter) and reusable 5 times.

Features

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

Analog Markers

Passive electrical devices designed to permanently denote the location of underground utility infrastructure. Round, flat, and miniaturised designs are available, each suited to different types of excavations and depths.

Features

- Reliable marking of underground utility infrastructure
- Round, flat, stick, and miniaturised designs available
- Different designs suitable for different trench sizes and depths
- Can be attached to assets or laid freely in trench
- Marker covers are made of high-strength plastics for resistance to mechanical and chemical damage
- Work reliably for decades without maintenance

Marker Locator

Innovative locating device for the detection of underground asset markers.

Features

- Reliable and unambiguous detection of underground utility infrastructure
- Suitable for detection of both analog and smart markers
- Suitable for detection of all marker types, including round, flat, stick, and miniaturised designs
- Inbuilt camera with digital display and GPS navigation
- Compatible with cloud-based digital asset management software

GasBlock ALU Terminator

Provides an effective gas- and water-tight seal of a MicroDuct pathway and a cable (not possible to install over already installed cable without an end). Easy to mount on MicroDucts from 5 to 20 mm (outer diameter) and reusable 5 times.

Features

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

Smart Markers

Passive electrical devices designed to permanently denote the location of underground utility infrastructure. Round, flat, and miniaturised designs are available, each suited to different types of excavations and depths. Each smart marker has a preprogrammed ID number which enables digital management of underground asset data.

Features

- Reliable marking of underground utility infrastructure
- Each marker has a pre-programmed ID for digital management of underground asset data
- Round, flat, and miniaturised designs available
- Different designs suitable for different trench sizes and depths
- Can be attached to assets or laid freely in trench
- Marker covers are made of high-strength plastics for resistance to mechanical and chemical damage
- Work reliably for decades without maintenance

Learn more about our full accessories range and technical data:

www.duraline-europe.com/en/accessories/MicroDuct-and-DuraOpto-Accessories/

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:

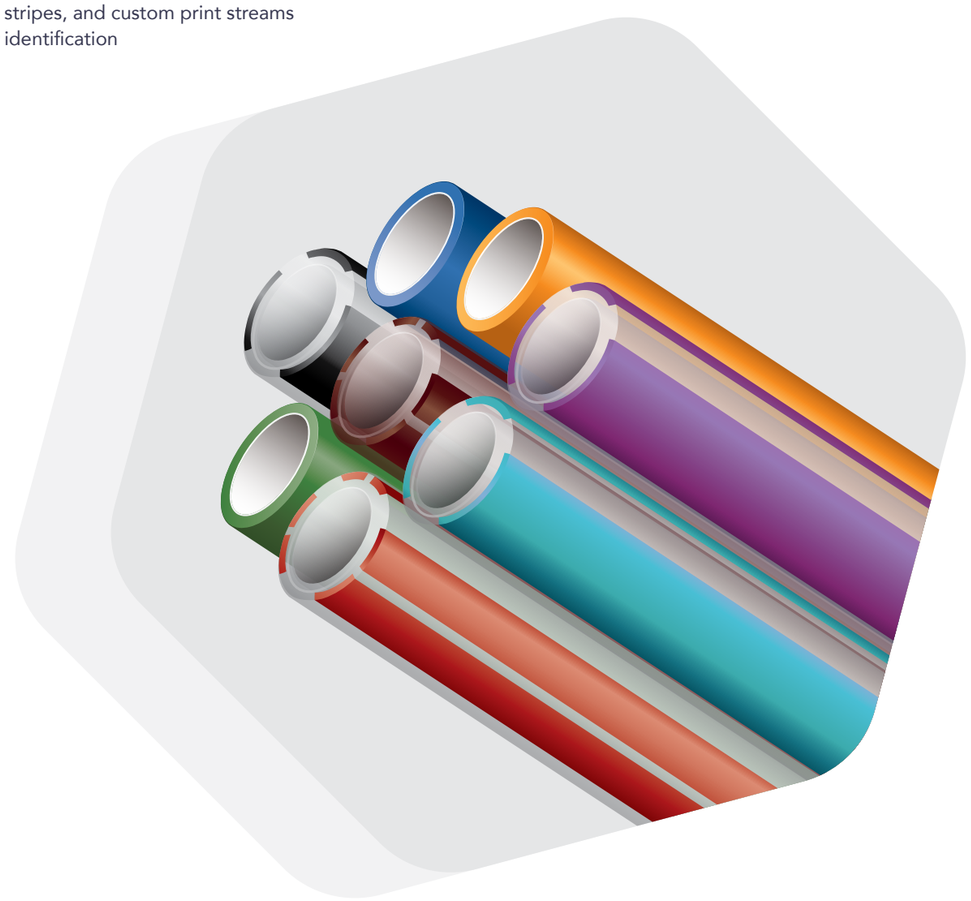
- Made from high quality virgin HDPE
- Highly Pressure resistance: suitable for air or water jetting
- Available with SILICORE®, a permanently lubricated, coextruded inner lining that provides a lower inner coefficient of friction (<0.1) for maximum cable blowing length

Additional Customization:

- Smooth or Ribbed Lining
- SILICORE® or SILICORE® ULF
- Pulling Rope
- Rip Cord
- Detect Wire
- Anti-Rodent
- Packaging

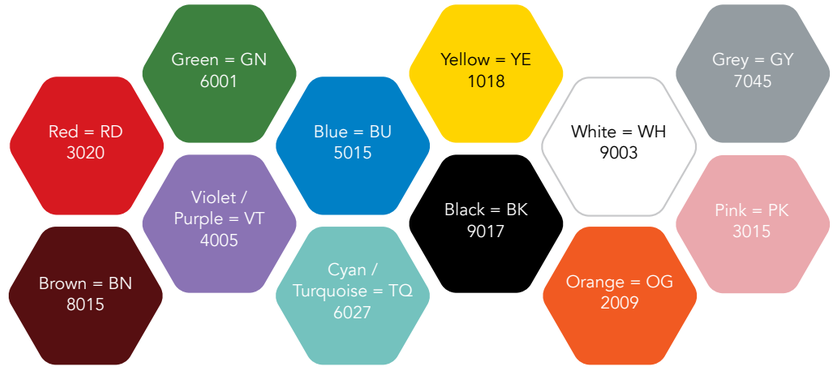
Custom Product Markings

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



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 - Smooth / Ribbed - 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

Return of wooden drums

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".

www.duraline-europe.com/en/contact/contactform-Drum

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.

NOTES

GET TRAINED BY

Dura-Line Academy

Dura-Line Academy provides industry-leading training to design, deploy, and maintain networks flawlessly around the world.

Our training is geared towards a wide range of users from network owners, to designers, engineers, and installers.

- Mobile-friendly
- Interactive games and assessments
- Mini courses (<15 min to complete)
- Industry-recognized certificates

Get Started

Create an account at **www.duraline.com**!

Contact academysupport@duraline.com.

Reach out to your sales contact for more information.

dura·line ACADEMY

Today's Training for Tomorrow's Network

Dura-Line Academy is a proud BICSI Continuing Education Credit provider.

dura·line

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+49 (0)5931 9963 620

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www.duraline-europe.com

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