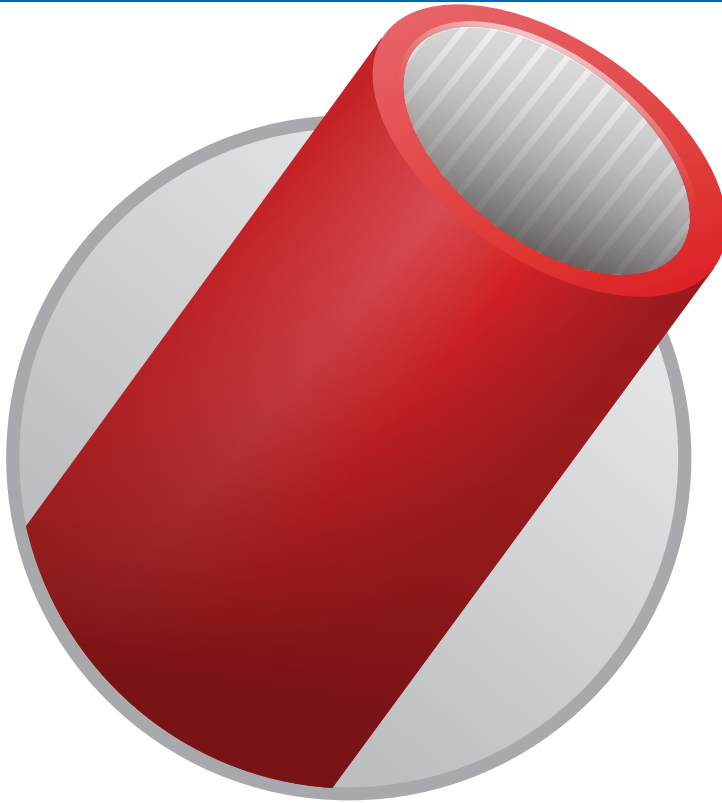


SMOOTH OUT RIBBED IN

www.duraline.com



Customer Service
800-847-7661



FEATURES:

- Available from 1" to 6" diameters
- Manufactured from flexible HDPE, makes gradual bends without special equipment
- Internal longitudinal ribbing reduces friction during cable placement
- Continuous lengths reduce joining costs
- Excellent low temperature properties, allows installation in cold climates
- Outstanding long term cable protection from shifting ground, rock and root impingement
- Provides a permanent pathway, simplifies future cable repairs or replacement
- Available with UV protectant for aerial/lashed placement

INSTALLATION APPLICATION:

Existing Conduit, Plow, Direct Burial, Aerial

MARKET APPLICATION:




COLOR/STRIPE:



OPTIONS:

FOOTAGE MARKINGS Sequential foot or meter markings. Custom print streams available.

SILICORE™  SILICORE is co-extruded with the tough HDPE jacket creating a super, slick permanent lining. SILICORE lined ducts allow for higher speed cable jetting and longer cable pulls.

RIBBED Internal straight ribs.

PREINSTALLED TAPE Factory pre-installed Bull-Line™ Pull Tape with EVEN-LOAD™, ensures extra slack at any access point throughout the reel. Available 500lb - 6,000lb tensile strength or locatable.

PREINSTALLED CABLE Specify single or multiple cables to be factory pre-installed.
Cable types: Service Drops, Fiber, Coaxial, 600Volt Al, 600 Volt Cu, Medium Voltage.

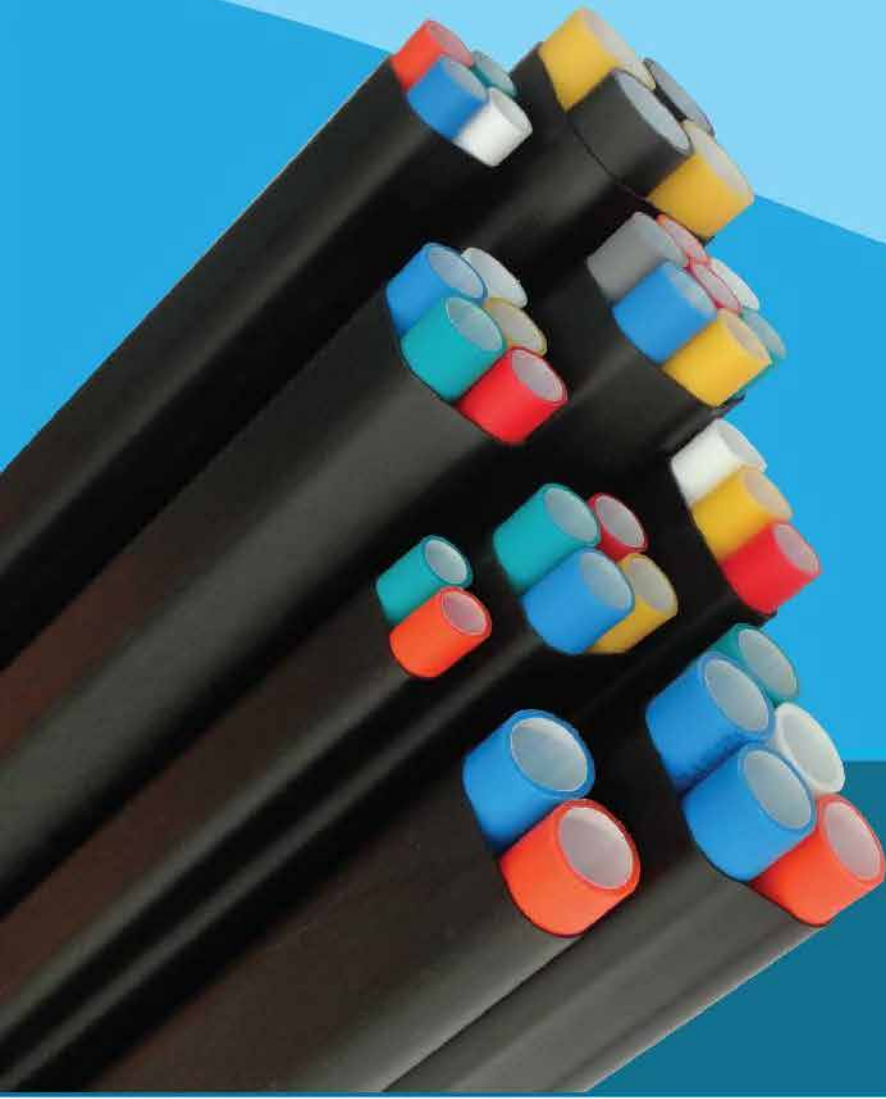


Customer Service • 800-847-7661



Jumbo Future PathTM

*Faster, Safer, Easier & Cost-effective way for
building future-proof Communication Networks....*



Jumbo Future Path (JFP)

Jumbo Future Path (JFP) is the latest in the series of product Innovation from Dura-Line, essentially consisting of multiple HDPE ducts of specific sizes and construction, all carefully bundled with a PE over sheath, suitable for direct burial underground application. All the Ducts have inner permanent super-slick lining of Silicore™ to reduce friction during cable placement.

The product is the right choice for all Project Managers in bringing best savings through reductions in project cost and time besides making the network innovative, flexible and futuristic.

- Available in different duct sizes, viz 20mm, 25mm, 32mm, 40mm & 50mm O.D.
- In bundles of 2 to 7 pathways, supply lengths of upto 1000 mtrs.
- Ideal for Backbone, Metro & Campus networks.
- Suitable for installation through Open trench, Ploughing, Saw Cut or HDD.

JUMBO FUTURE PATH (JFP) BENEFITS

Jumbo Future Path offers significant benefits over Traditional Network Designs.



Traditional Network

Main Duct supplied in 6-12 meter lengths

Reduction in Installation & civil Costs

- Reduces jointing & laying costs of Main ducts;
- Reduces cost of pulling in sub-ducts which are pre-bundled from factory
- Reduces consumption of manholes by > 30%
- Trench size is minimized; savings in civil cost > 30%



JFP Network

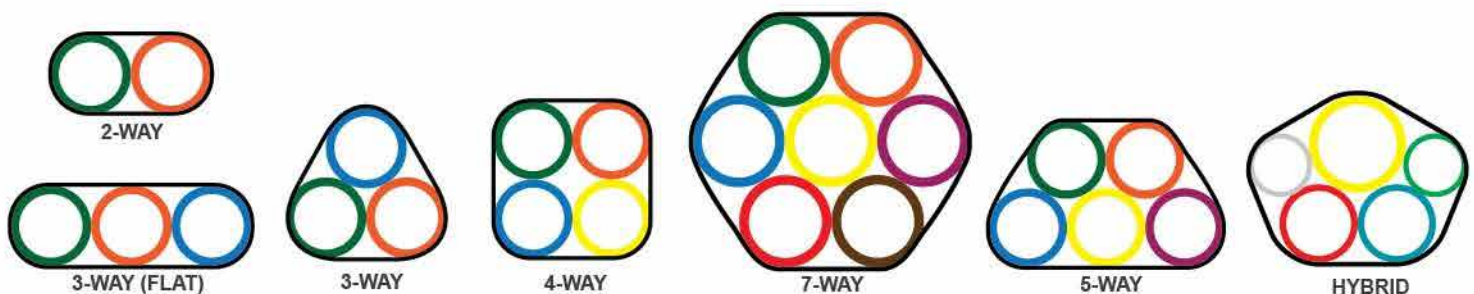
Continuous Supply length of 500-1000 meters.

Improves cable installation performance reducing cost

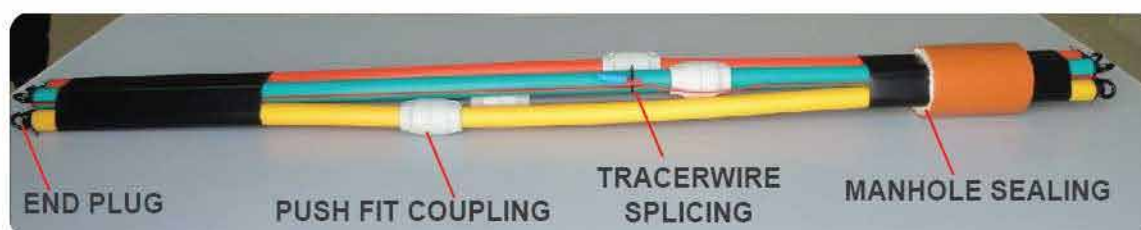
- Pre-installed pull rope saves cable installation costs
- Silicore™ inner layer
 - Cable Blowing up to 2 Kms.
 - Lower Pulling force (approx. 80% lower than non silicore ducts)
 - Higher fill factor enabling use of higher dia cables in each duct

Quick network roll out; lower project management costs

JUMBO FUTURE PATH (JFP) CONFIGURATIONS



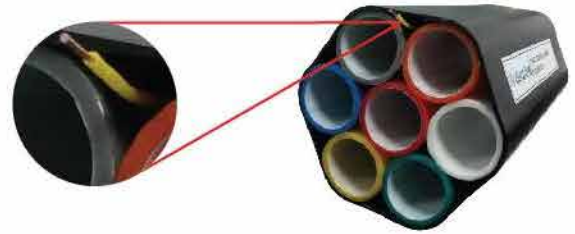
ACCESSORIES FOR INSTALLATION



INNOVATIVE TRACEABILITY FEATURE

Jumbo Future Path (JFP) in all configurations can be offered with a value added Detectability Feature, through tracer copper wire along its entire length. It provides following benefits:

- Inch by Inch traceability of underground network.
- Accurate Depth Measurement.
- Identifies and records GPS co-ordinates.
- Provides Traceability and depth measurement to networks built with HDD.
- Avoids cutting/damaging other networks and saves time and repair cost during maintenance / upgradation.



GPS Longitudinal and Latitudinal Report

Log No	Longitude	Latitude	Depth (m)	Current (A)
*1	73°56'9.42"E	15°22'21.923"N	0.294	0.007
*2	73°56'9.366"E	15°22'21.894"N	0.338	0.006
*3	73°56'9.636"E	15°22'21.426"N	0.284	0.004
*4	73°56'9.954"E	15°22'22.656"N	0.493	0.005
*5	73°56'9.738"E	15°22'22.71"N	0.362	0.005
*6	73°56'9.126"E	15°22'20.268"N	0.039	0.028
*7	73°56'8.975"E	15°22'20.31"N	0.298	0.008
*8	73°56'8.982"E	15°22'20.31"N	0.276	0.007
*9	73°56'8.982"E	15°22'20.31"N	0.301	0.008
*10	73°56'8.988"E	15°22'20.304"N	0.3	0.009



FEATURES

INSTALLATION APPLICATION:

Underground, Plowed, Open Trench, Directional Drilled

MARKET APPLICATION:




COLOR:



OPTIONS:

FOOTAGE MARKINGS Sequential foot or meter markings. Custom print streams available.

SILICORE™  SILICORE is co-extruded with the tough HDPE jacket creating a super, slick permanent lining. SILICORE lined ducts allow for higher speed cable jetting and longer cable pulls.

RIP CORD Rip Cord(s) for easy opening of the sheath.

LOCATE WIRE All JFP configurations can be supplied with Tracer copper wire for 100% traceability.

SUBDUCT OPTIONS Smooth Inner Wall, Straight Inner Ribbed, Spirally Inner Ribbed



PRE INSTALLED ROPE Subducts can be supplied with pre installed cable pull rope from factory

SUPPLY / PACKING OPTIONS



Coils



Steel Reel

COMPANY PROFILE

Dura-Line Middle East is a part of Dura-Line Corporation (headquartered in Knoxville, Tennessee, USA). Dura-Line is the world's largest manufacturer of "Silicore" Permanently Solid Lubricated HDPE Ducts, Conduits, Fluid Pipe Systems, Power and Gas Ducting solutions. It serves clients in over 120 countries and its current 20 manufacturing facilities are spread over United States, Mexico, Czech Republic, Oman, India and South Africa.

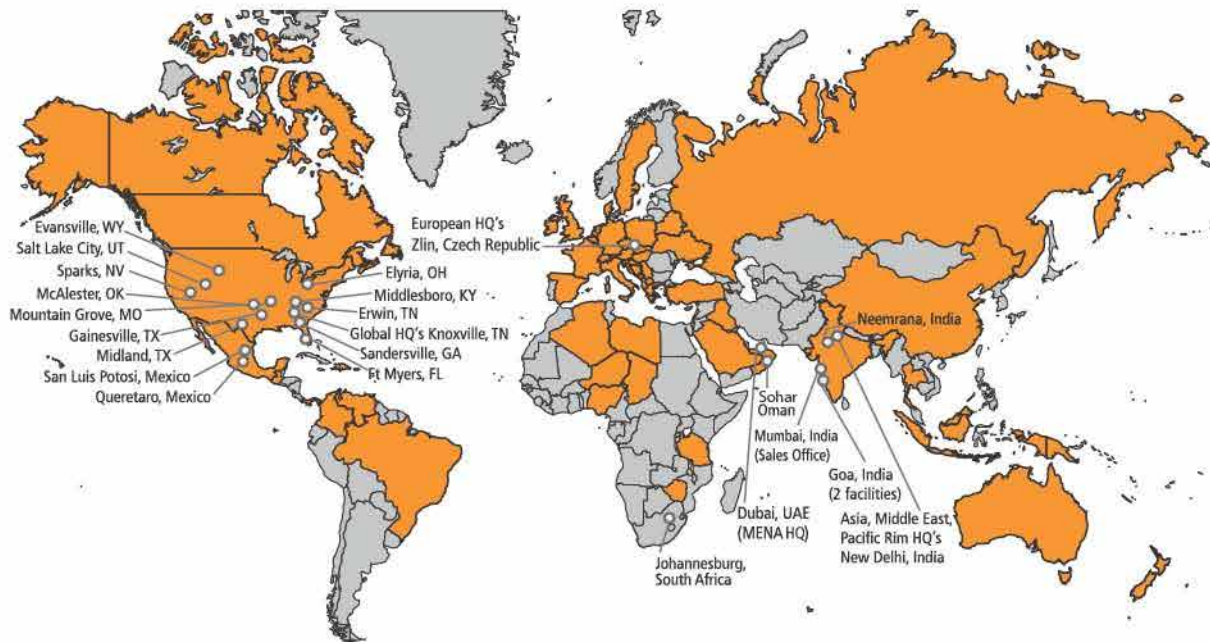
Backed by a strong R&D and a large repertoire of "cutting-edge technology" offerings, Dura-Line is ISO 9001, ISO 14001 and OHSAS 18001 certified, and has a tradition of providing quality products and services exceeding customers' expectations. It offers products, solutions and turnkey services for building future-proof Communication (Telecom, Data, and Video), Fluid, Gas and Power Duct Networks. The solutions include end-to-end services-from route designing & engineering, trenching, supply and laying of ducts & cables, fluid pipelines, testing etc.

"Duraline - Plumettaz Fiber Academy" at Goa, India imparts training on the best practices and advanced techniques of Fiber Network Roll-out including PON FTTH Networks.

Dura-Line is a Partner of Choice of several major Global Telecom Operators worldwide with exclusive multi-year contracts.



"Dura-Line – Global Presence"



USA



CZECH REPUBLIC



INDIA



MEXICO



OMAN



SOUTH AFRICA

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MicroTechnology

Tomorrow's Technology YOU CAN INSTALL TODAY



Introduction

Dura-Line's MicroTechnology is a revolutionary new technology that enables rapid roll-out of effective FTTH network duct and unearthen empty spaces.

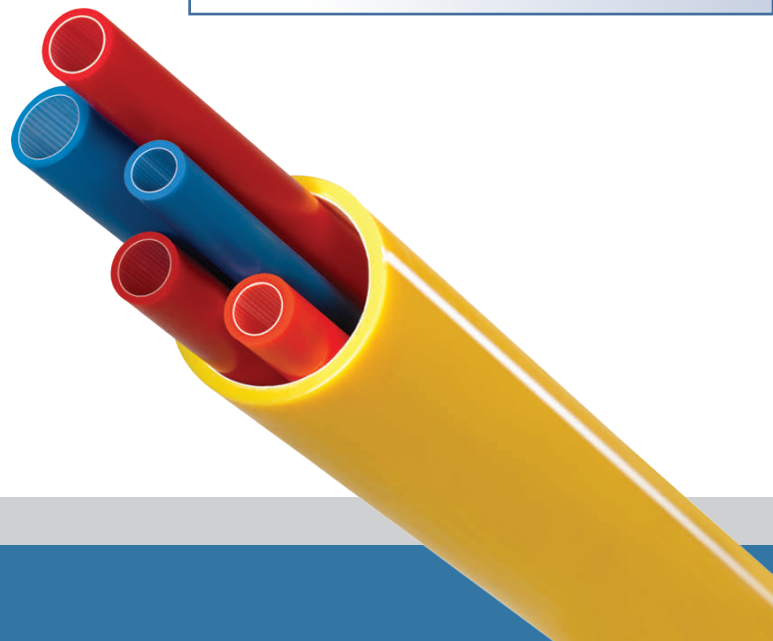
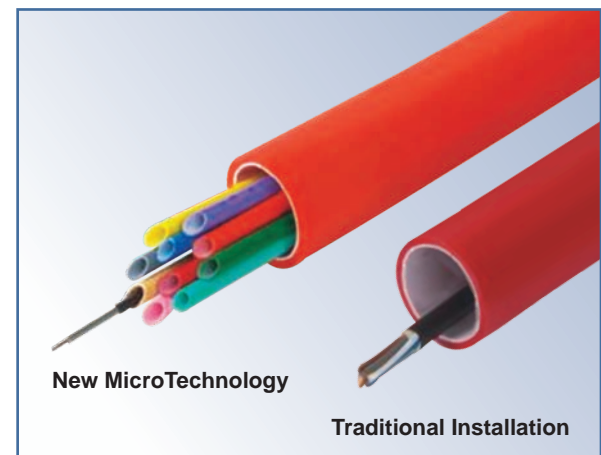
This unique concept, designed by the world leader in ducting technology, provides great flexibility in designing Optical Fiber Network architecture. It involves blowing Dura-Line MicroDucts into a HDPE duct or direct deployment of MicroDucts to create several pathways for Optic Fiber Cables to be blown and introduced in the network as and when required.

As a result, every time a network expansion is required, there is absolutely no requirement for digging, laying and cable pulling all over again. Simply blowing a Dura-Line MicroDuct in the existing main duct and blowing the cable will suffice.

Similarly, several MicroDucts can be deployed for structured cabling inside a building. It provides flexibility to upgrade CAT 5 to CAT 5e, CAT 6 or Optic Fiber Cable as and when required without any additional civil work.

MicroTechnology Advantages

- Reduces initial capital expenditure
- Maximizes space usage in ducts
- Allows additional pathways for future expansion
- Allows quick re-routing
- Faster installations and roll out of networks
- Lowers overall installation and cable costs
- Facilitates mid-span access to any place, anytime
- Lessens splices during repairs
- Reduces total Fiber length
- Makes networks upgradeable without any civil modifications



MicroDucts - Variants



MicroDucts

MicroDucts: These are very small aperture HDPE ducts, which have applications both in in-premise networks as well as OSP. Standard Sizes: 14/11.5, 14/10, 12/10, 12/8, 10/8, 10/5.5, 7/5.5, 5/3.5 mm, etc.



Armoured MicroDucts

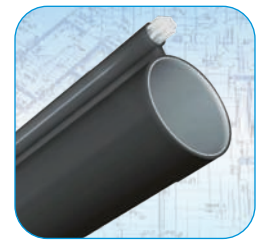
Armoured MicroDuct: Armoured MicroDuct is a standard MicroDuct having a strong layer of ECC Steel Tape Armor and a UV stable HDPE outer sheath for use in aerial and underground networks.

MicroDuct-in-Duct: In this construction, one MicroDuct is integrated inside a standard telecom duct during manufacturing. While an Optic Fiber Cable can be blown in the main duct, the empty MicroDuct can be used in future for upgrading the network.



MicroDucts-in-Duct

Figure-8: It is available for direct aerial installations.



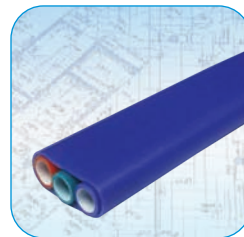
Aerial Duct



FuturePath

FuturePath: FuturePath is a bundle of MicroDucts sheathed together, providing multiple (future) pathways. MicroCable(s) can be blown / pulled anytime in the individual MicroDucts, as the network grows, without the additional cost of constructing a new duct route.

FuturePath is also available with Optional 'Copper Tracer Wire' and 'Rip Cord'. The Copper Tracer wire is used for future tracing and Rip Cord enables tearing of sheath for making the MicroDucts accessible for branching.



DuraFlat

DuraFlat: DuraFlat is a flat formation of several MicroDucts held together by a thin Web of a common sheath. This flat design enables easy branching of MicroDucts to –

- each floor in Multi-Storey buildings
- each house in a straight lane in FTTH PON network

The number of MicroDucts and size of each MicroDuct is decided by the application it is required to serve.



(a)

(b)

(c)

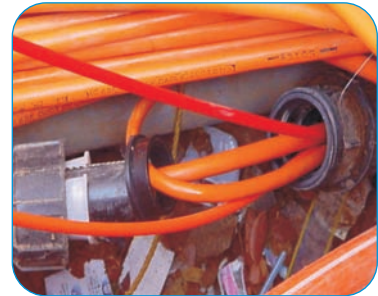
DuraFlat Branching

MicroTechnology Applications

1. Outside Plant (OSP) Applications:

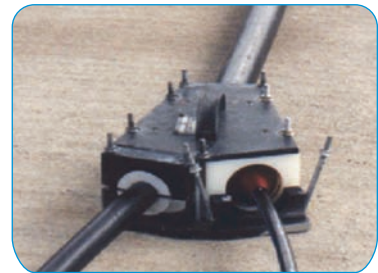
- **Over-ride:**

MicroDucts are blown into an existing standard telecom duct having a resident Optic Fiber or a Copper Cable.



- **Simultaneous Blowing Cable and MicroDuct:**

One normal Optic Fiber Cable and one MicroDuct are simultaneously blown inside an empty HDPE duct.



- **Bundle Jetting:**

Multiple pathways are created on-site in an existing empty duct for installation of OFC from point-to-point without splicing by simultaneously blowing several MicroDucts in an empty HDPE Duct.



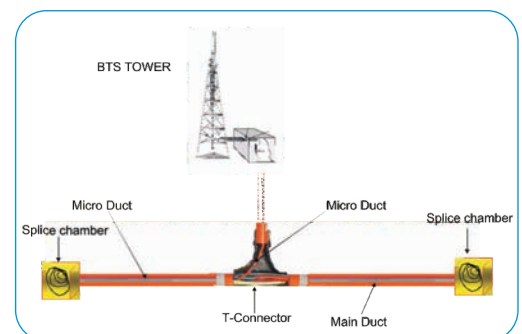
- **Factory Pre-installed:**

Dura-Line also offers factory pre-installed MicroDucts in ducts, where space utilization is even higher than on-site bundle jetting.



- **BTS Tower Connectivity:**

Multiple MicroDucts are installed in a HDPE Duct to connect BTS Towers with the nearest optical ring.



- Micro-trenching for Metro Access Networks:**
 In metro cities, Micro-trenching techniques overcome the vexing problem of ROW's permission and facilitate quick access network build-out. A swift clean micro-trench is cut out by sophisticated trenchers and roads are restored to original form in a fast, parallel, continuous process.



- Aerial Deployment:**
 For deploying Fiber Optic Network in difficult hilly terrains or congested city areas, Figure-8 Armoured MicroDucts are installed aerially.

 Aerial ducted optical fiber network can be built utilizing ROW along electric poles, telephone poles or by installing new poles.

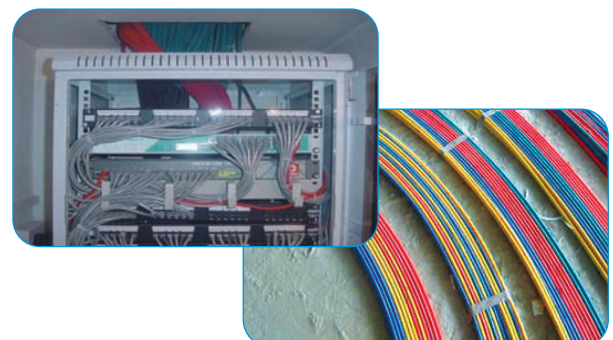


- Kerb to Building Connectivity Application:**
 MicroDuct is used for connecting buildings by utilizing the extra space available in the existing standard Telecom Duct having a normal Optic Fiber Cable.



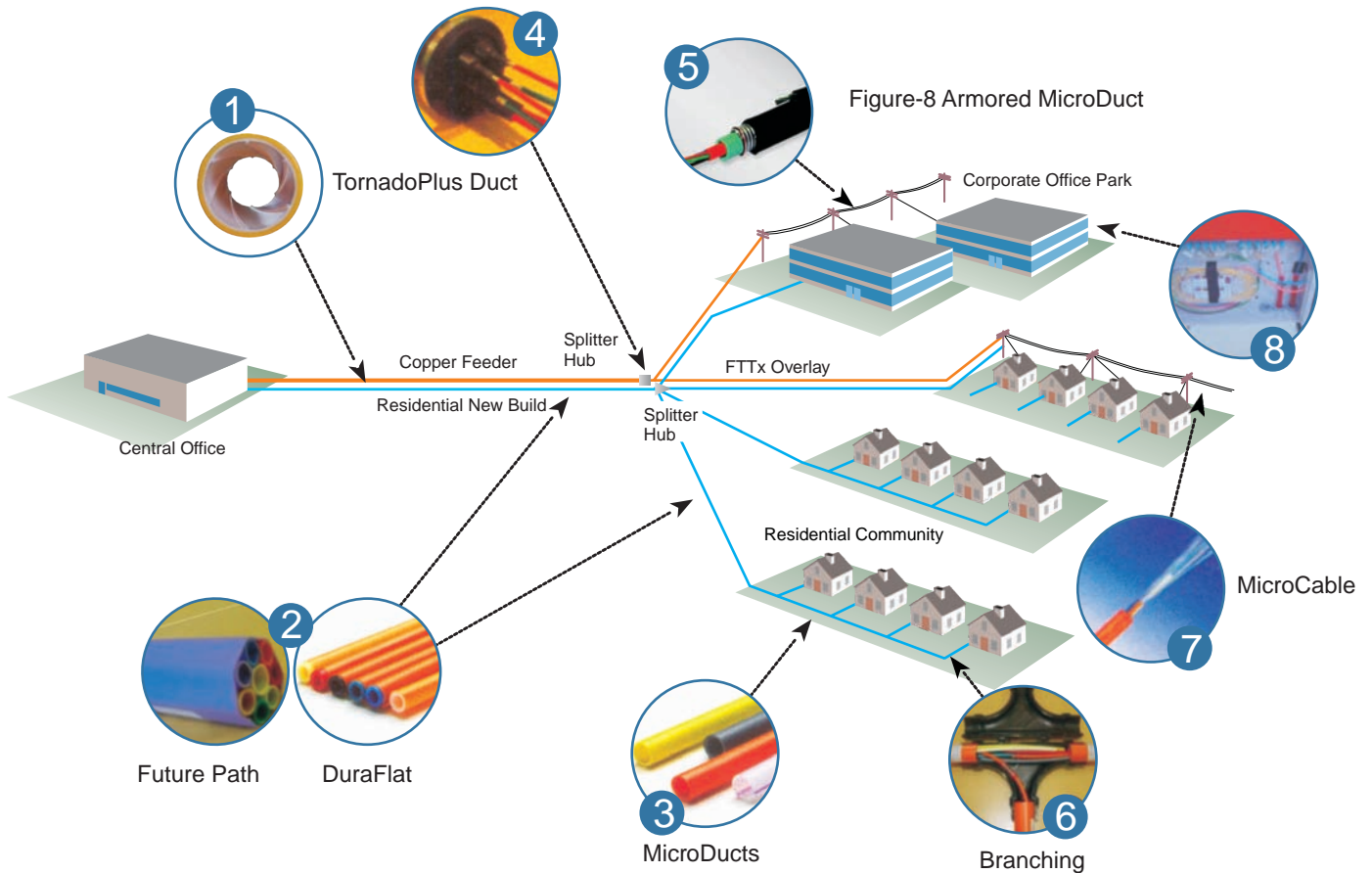
2. In-premise Applications:

- LAN (server to workstation):**
 MicroDucts are installed within concrete/slab, walls, false ceiling - from server to each workstation replacing conventional raceways / PVC conduits to make the installation fiber ready.



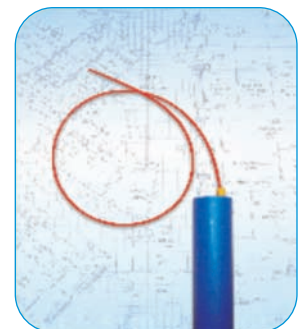
3. Delivering FTTx:

- **FTTx Application:** An unparalleled range of products enabling efficient rollout of complete FTTH deployment.



MicroTechnology - The Add-ons

MicroCable: This is a specially designed, blowable multi-Fiber Optical Fiber Cable with a unique cable construction to achieve a very small diameter. The diameter ranges from 1.8 mm for a 2-Fiber MicroCable to 7.2 mm for a 96-Fiber MicroCable.



MicroCable

MicroAccessories: Dura-Line provides a complete range of accessories required for network building with MicroTechnology, including Push-fit Couplers, Simple Plugs, End Plugs, Straight Split Couplers and T-Split Couplers, Y-Enclosure, T-Enclosure & Tube Distribution Closure.



MicroAccessories

Tools : Rotary Cutter, Straight Cutter, Pulling Harness, Rodders



Straight Cutter



Rotary Cutter



Fiber Distribution Housing



Y-Enclosure



Tube Distribution Closure



Rodder

Hands-on Training on MicroTechnology

Dura-Line offers an intensive off-site training programme on MicroTechnology at its Telecom Academy in Goa - the only school in the world that offers training in Telecom Ducting Technology. The training provides comprehensive knowledge of deploying and maintaining of MicroTechnology products and applications.



Company Profile

A-D Technologies, headquartered in Knoxville, Tennessee is the amalgamation of two industry leaders, Arnco and Duraline.

Dura-Line is the world's largest manufacturer of 'Silicore' Permanently Solid Lubricated HDPE Ducts, Conduits and Fluid Pipe Systems. Arnco specializes in Power and Gas Ducting solutions. A-D Technologies serves clients in over 120 countries and the current manufacturing facilities of the company are located in United States, Mexico, Czech Republic and India.

Dura-Line India has an installed capacity of 150,000 kms. of Ducts serving the regions of Africa, Middle East, India and South-East Asia.

Backed by a strong R&D and a large repertoire of 'cutting-edge technology' offerings, Dura-Line is ISO 9001:2000 and ISO 14001:2004 certified, and has a tradition of providing quality products and services exceeding customers' expectations.

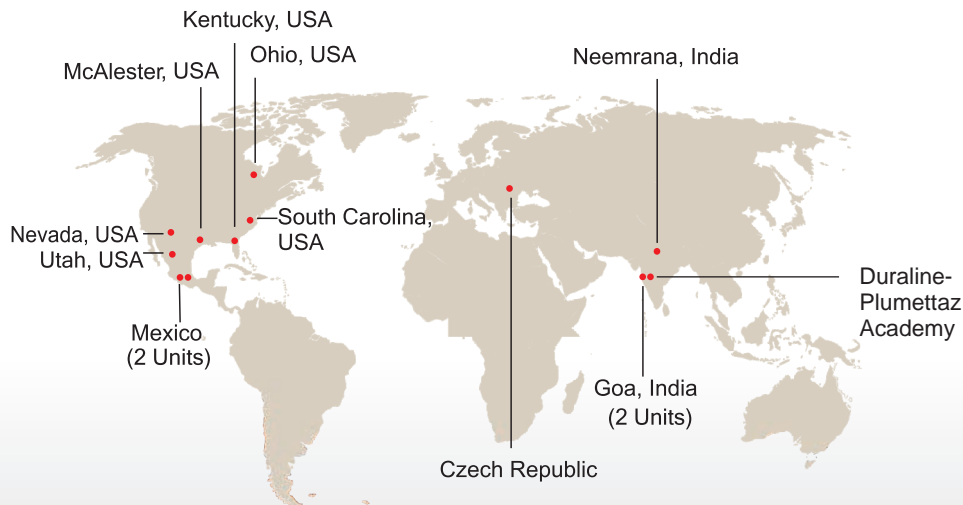
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Dura-Line is a *Partner of Choice* of several major Global Telecom Operators worldwide with exclusive multi-year contracts:



Dura-Line – Global Manufacturing Locations



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