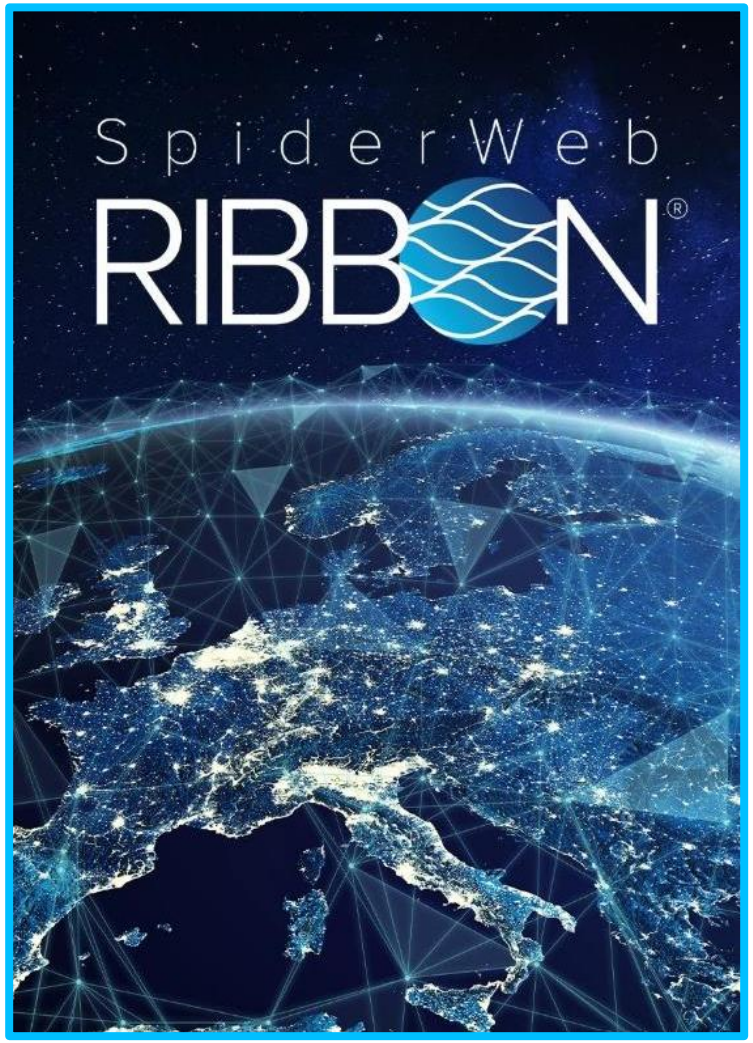
Fujikura



Unlocking the power of SpiderWeb Ribbon® (SWR®) for scalable, fast-track deployment of backbone networks

Presented by Paco Cabeza-Lopez

CONFIDENTIAL
FUJIKURA 2026

MDNOG

AGENDA

- Current Market Evolution
- Company Profile
- Fujikura: THE Vertical Fiber & Cable supplier
- Fiber Technology Innovation
- Success Stories & New Revenue Streams
- Conclusion



PREMISES - CURRENT MARKET EVOLUTION

Unprecedented global fiber demand

Market going thru unprecedented supply and demand pressure

Geopolitical concerns

How can we best weather the tempest?

Unprecedented demand of fiber cable:

- Driven by DC, AIDC, cloud and Dark Fiber Providers (not Telcos)

Fiber shortage:

- Market cannot cope with fiber demand: higher fiber counts, more quality and less attenuation (an AIDC requires 10x more fiber than a traditional DC)

The Consequence:

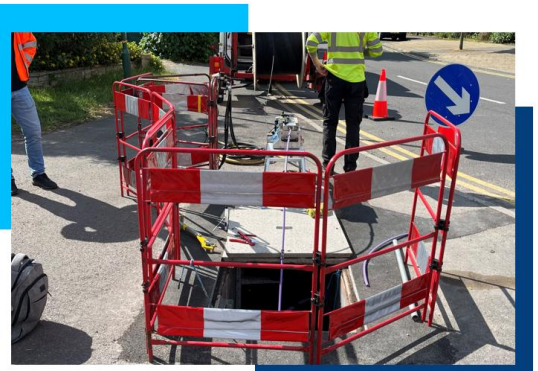
- Higher prices for everyone and longer lead times: Fiber manufacturers are setting the price and cable makers suffer the consequences

To top it all:

Recent geopolitical concerns and shipping crisis

New players come with new priorities

Why are wholesale operators & hyperscalers migrating to SpiderWeb Ribbon® technology?



Market desire for **higher fiber densities in lighter/thinner designs**

- **Increase in speed of deployment (up to 80%)**
- **Subsequent reduction in labour costs**
- Significantly **less downtime (MTTR)** after cable strike
- Sustainable solutions

AI, DCs, cloud and latency speeds
may take the headlines.
However, it is FIBER that makes it all work!!

Fujikura



COMPANY PROFILE

Who we are

Fujikura

Global Technology Innovator & Fiber Pioneer

We are a world-leading manufacturer of fiber optic products and optical network solutions (among others)

€6 billion (EUR)

Global manufacturing and technology leader

141 Year history

50K+ Employees

Est. 1885, Tokyo, Japan



- Optical Fibre and Cable
- Fusion Splicers
- Connectivity
- Closures
- Test & Inspection

Four primary business units

Telecom

Power

Automotive

Electronics

PORTFOLIO



TELECOMS | Optical fibre / Cables / Connectivity solutions
FUSION SPLICING | Fusion splicers / Test equipment
ELECTRONICS | FPCs / Sensors / Thermal solutions
AUTOMOTIVE | EV Connectors / Wiring harnesses / Sensors
MEDICAL | CMOS modules / PANDA fibre / WABE
ADVANCED PRODUCTS | Superconductors

KEY LOCATIONS

Over 140 Fujikura Group locations globally.

EMEA **24**
AMERICA **34**
CHINA **20**
ASIA & OCEANIA **41**

EMEA

Fujikura Europe (head office) | London, UK
Fujikura Europe | Munich, Germany
AFL Hyperscale | Milton Keynes, UK
AFL Hyperscale - Cambridge, UK
AFL Telecommunications – Gliwice, Poland
Fujikura Automotive - Romania, Morocco, Moldova, Ukraine

AMERICAS

AFL | Duncan, South Carolina



JAPAN

Fujikura Group (head office)| Tokyo Japan

ASIA & OCEANIA

Fujikura Automotive - Vietnam & South Korea
DDK - Bangkok, Thailand
Fujikura Electronics - Bangkok, Thailand
AFL – Melbourne, Australia

HQ & Factory Locations - Japan



Fujikura Suzuka Factory



Fujikura Head Office





Fujikura Precision (Kyushu Fusion Splicer Factory)



Fujikura Sakura Factory

FUJIKURA – Increased fiber and cable production



- € 70M investment for additional Fibre (SWR) capacity in Sakura (April 2025)
- Incorporating GX (green transformation) innovations to bolster production efficiency and deliver labor and energy cost savings

Sakura Factory, Tokyo



NEW cable factory In Morocco (2026)





AFL (South Carolina, USA)

AFL (Melbourne, Victoria)



Fujikura

FUJIKURA EUROPE LIMITED

Fujikura Europe Limited was established in 1988 as a European base of operations in the United Kingdom.

We've grown considerably in the last 38 years and now occupy a brand new 1,300m^2 site in Chessington, Southwest London, which houses our sales, administration and distribution functions, plus European technical support centre and service/repair workshops.



ESTABLISHED 1988
LOCATION London
EMPLOYEES ~60
ANNUAL SALES €140m+

PRODUCT DIVISIONS

Telecommunications | Fusion Splicer
Medical and Industrial | Optical fiber | fiber Laser
Electronics | Automotive | Advanced Products



FUJIKURA, THE VERTICAL SUPPLIER (since day 1)

VERTICAL SUPPLIER OF FIBER & CABLE - since 1974

Fujikura

FUJIKURA is one of the very few suppliers in the globe that can provide FULL process of Fibre Optic cable and splicing technology

FIBER PREFORM ▸ FIBER DRAWING ▸ RIBBON FIBER (SWR) ▸ ARMOURING ▸ CABLING



\+

RIBBON SPLICERS

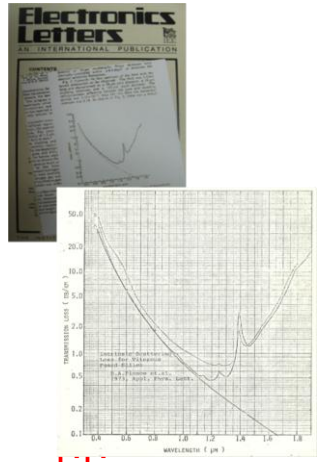
CONNECTIVITY

TEST & INSPECTION



Optical Fiber History

1965
Sir Charles K. Kao (Nobel prize in Physics, 2009) reported about using optical fibers for telecom purposes.



1974
Fujikura started development of optical fibers.

1976
Fujikura discovered an extremely small point of attenuation (0.47 dB/km) which would allow for competitive commercial services with optical fibers

1979
Fujikura's fiber cables were selected for Japan's first field test organized by Japan Telecom (NTT). Then also selected for 2nd field test in 1980.

1985
Fujikura developed world-first core alignment splicer.



1986
Fujikura supplied the fiber cables for the first nationwide optical fiber network in 1986. These trunk cables are still in use today after 40 years of use.



Fujikura

Fiber Technology Innovation

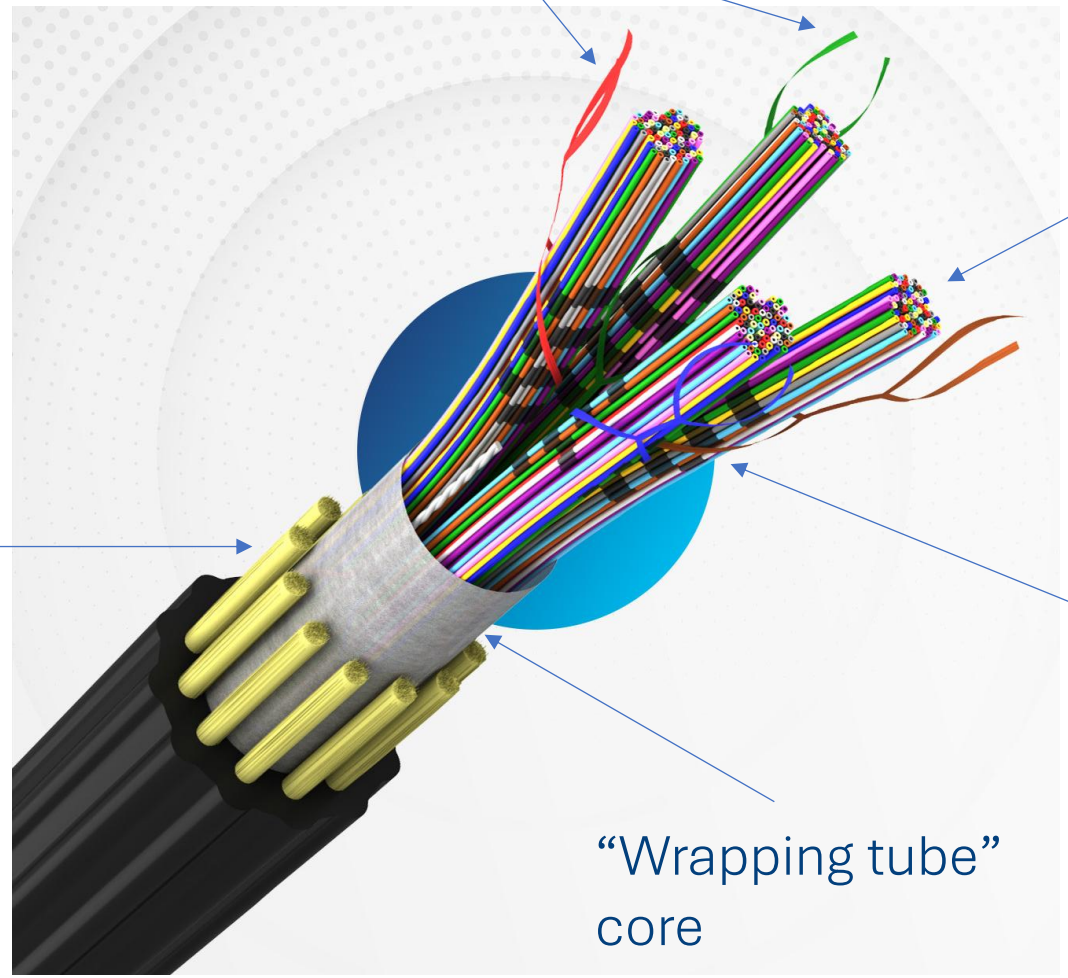
WTC™ with SWR®



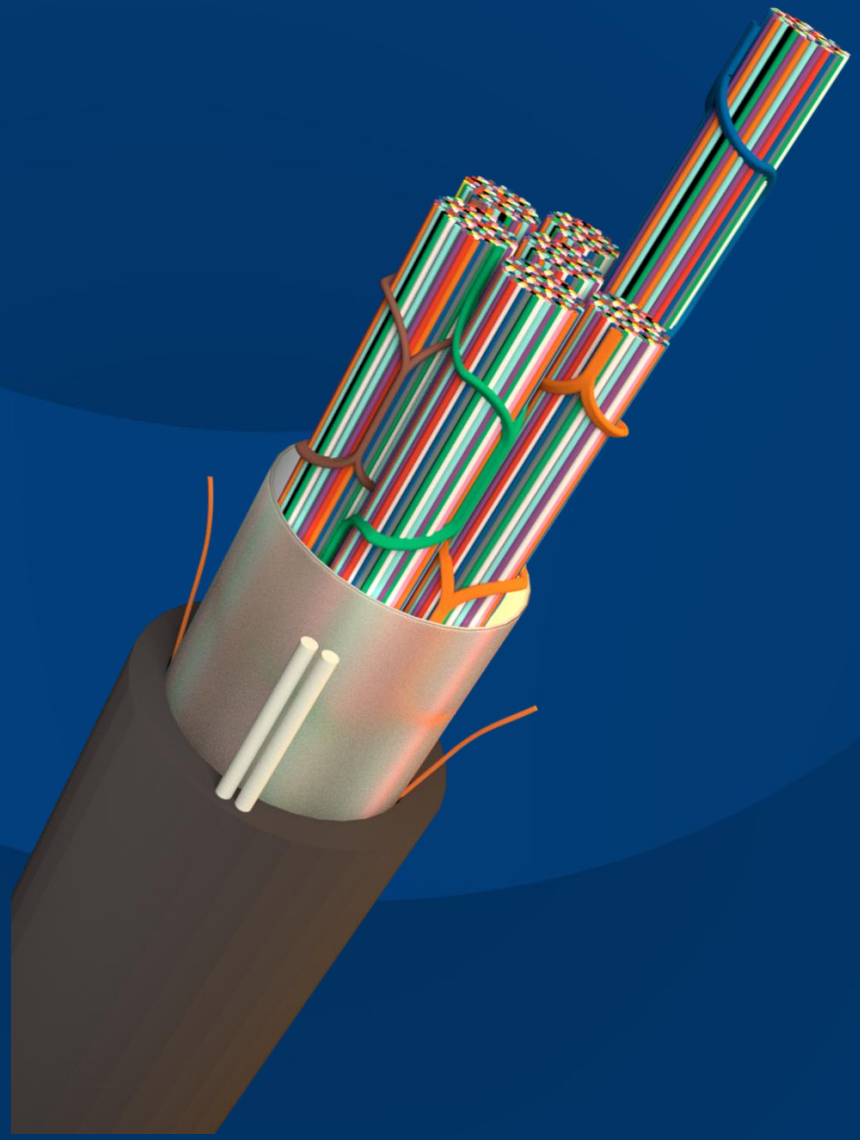
Fujikura

Spider Web Ribbon
SWR®

WTC™ with SWR®


Color coded binder groups
SpiderWeb Ribbons® (SWR®)
Embedded peripheral strength members
Individual (SWR®) identification markings
“Wrapping tube” core

Wrapping Tube Cable with SWR



SpiderWeb Ribbon® (SWR®) Fiber

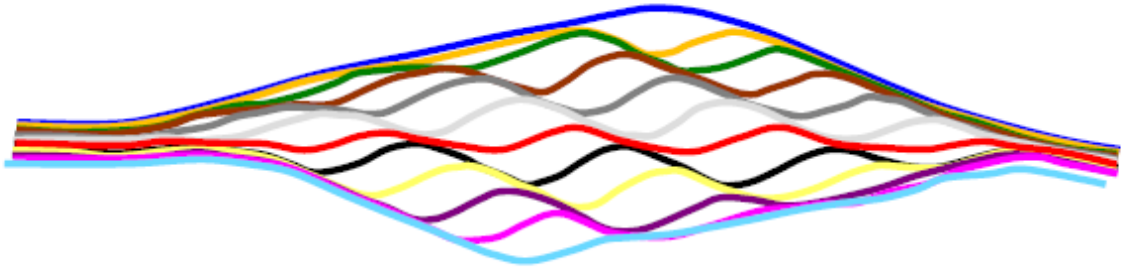
- Ultra high-density designs
- Fibre counts from 24F up to 13824F
- Intermittently bonded ribbon
- SWR® optimized for Mass-Fusion Splicing
- Compatible with legacy single fiber loose tube cables
- Very easy identification

Wrapping Tube Cable (WTC)™

- Small diameter
- Light weight
- Dry cable core
- Ribbons arranged in binder groups
- Armoured and dielectric designs
- Gel-free water blocking technology

SpiderWeb Ribbon design and construction

- Spider Web Ribbon fibre
- 12 individually coloured fibres
- Intermittently bonded fibres



12F SWR

Fiber Colors in 12F SWR

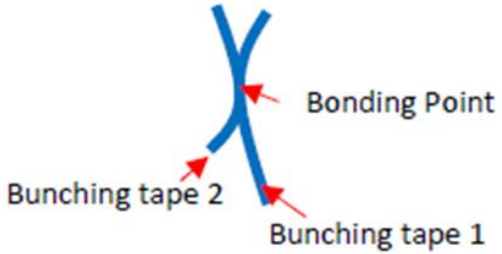
No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12
Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Turquoise

Stripe Ring Mark[*2,3]

SWR No.1	SWR No.2	SWR No.3	SWR No.4	SWR No.5	SWR No.6
▮	▮▮	▮▮▮	▮▮▮▮	■	■▮

- Individual ribbon identification

- Heat-bonded coloured binder groups

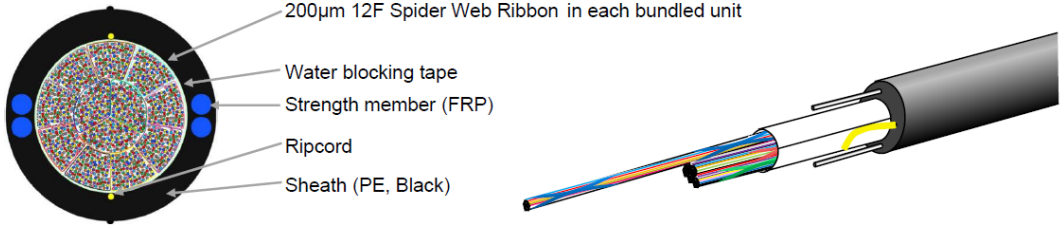


Design concept of innovative cable

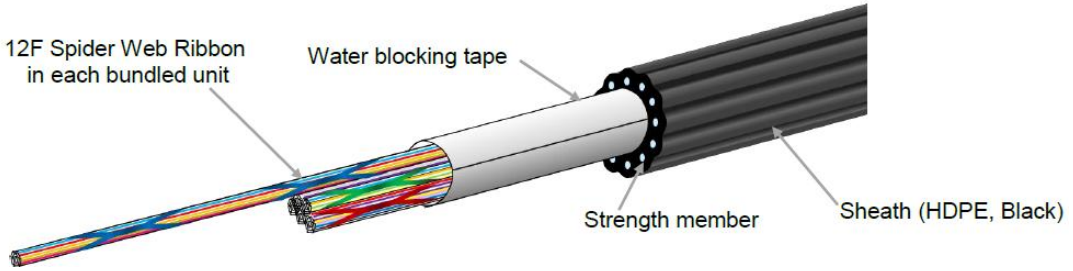


- Range of Wrapping Tube Cable (WTC) designs
- Internal and external applications
- Includes single and double-jacket armoured
- Includes aerial designs (OPGW and ADSS/ADSSW)

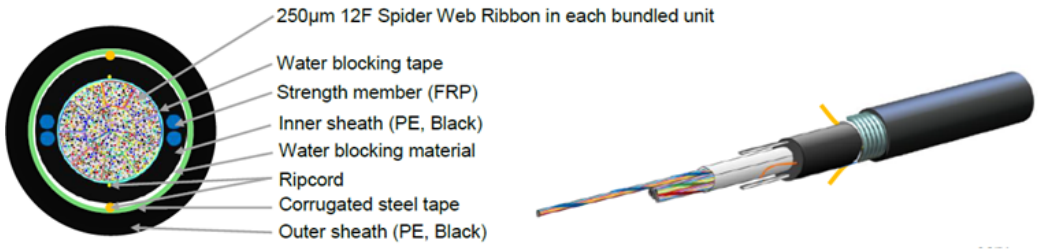
OSP WTC (pulled)



Air Blown (AB WTC)



Double jacket armoured WTC



Double jacket armoured LSZH WTC



Blowing capabilities

- Proven and established technology – different ducts, tracks and blowing equipment
- Distances >2000m have been achieved (test sites and field)
- Tests have been completed in 30-40 minutes
- Blowing speed typically >40m/min



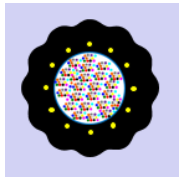


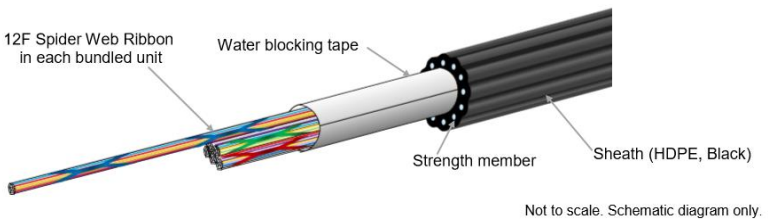
RADIUS Systems

EMTELLE

gabocom a HellermannTyton brand

dura-line





Not to scale. Schematic diagram only.

CBS PRODUCTS Leaders in Advanced Cable Installation Equipment

KLEIN TOOLS EST 1857

Tornado Plus

JetStream

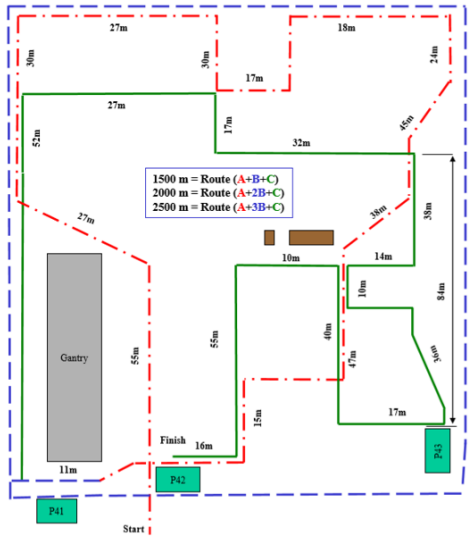
AirStream

Hurricane

PLUMETT INTELLIJET™

MJet V3

JETTING By fibre blowers. For fibre blowers.



Real world deployment example

Maximum reported install distance: 2,980 metres

Mohammed Mujaed • 1st
Regional Programmes Manager - St Albans and Watford Fibre Cities at Openreach
6mo • Edited •

Right so I must apologise regarding my last post about the 432 fibre looks like #stalbansfibrecity isn't the first to use this as this has been used as part of trial elsewhere in the company. I am the first to use it part of national rollout thanks to a few colleagues for pointing it out.

#Fujikura were on site with us and they have said they are only aware of a 1500m max blow in the cable in one go and last night we #stalbansfibrecity set a new record 2980m in a single blow (no tandem/centre blows) which is impressive. Well done to the team for making it happen. 4.7k in allowing a spine to feed 4000 prems in Bowmans Green exchange to be completed.

#weareopenreach #stalbansfibrecity

Samuel Elliott Ben Springate





Cable blown and duct conditions



Cable diameter: 14.3mm
Duct inner diameter: 20mm
Fill ratio: 51%
Blowing distance: 2,980m



Honoring SLA and Minimizing MTTR

By minimising MTTR and enhancing SLA compliance, providers can avoid costly penalties associated with services outages and delays.

Operational Benefits

Substantial time and cost savings using SpiderWeb Ribbon® cables

Cable strike

- Significantly reduced outage time
- Urgent circuits restored quickly
- Improved Mean Time To Repair (MTTR)
- Positive impact with respect to break-fix Service Level agreement (SLA).

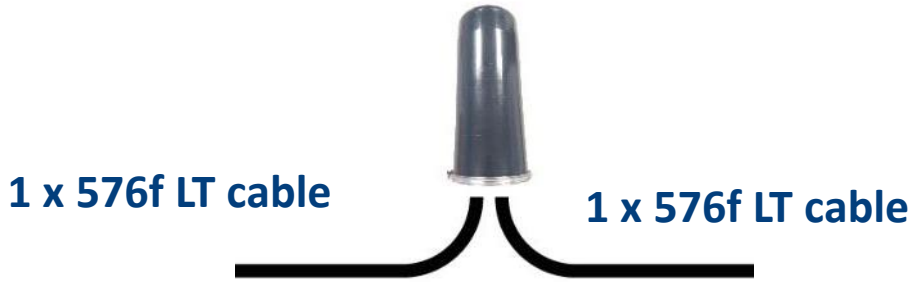
Typical restoration time in hours

- **576 fibre LT duct: approx. 30 hours**
- **576 fibre WTC™/SWR® : approx. 8 hours (48 ribbons)**



576F loose tube (single-fibre) vs WTC™

We estimate clients can save 20+ hours on every joint with 576f Wrapping Tube Cable™ versus single fibre Loose Tube



LT cable preparation per joint	**16 hours**
LT splicing and traying (576f single-fibres)	**14 hours**
Total time	**30 Hours**



WTC™ cable preparation per joint	**3 hours**
SWR® splicing and traying (576f = 48 ribbons)	**5 hours**
Total time	**8 hours**



SUCCESS STORIES & NEW REVENUE STREAMS

ENAGAS

Fujikura

Enagás: the natural gas transmission and distribution network of Spain

Why and for what Enagas has installed a fiber optic network?



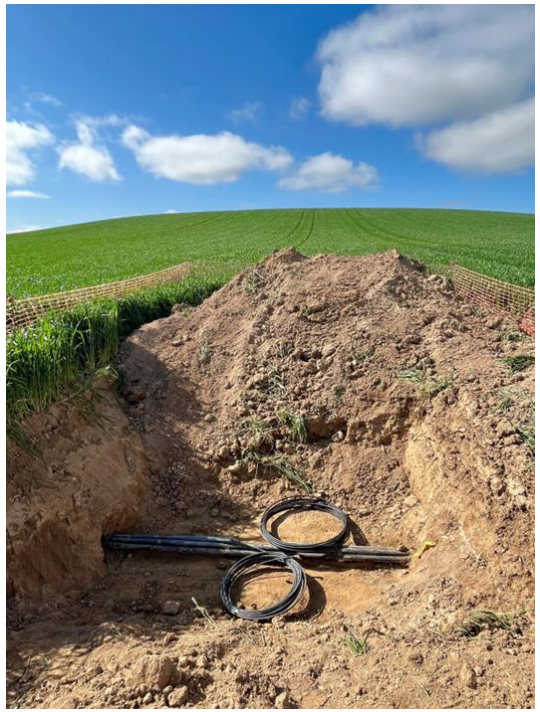
- Need for remote control that guarantees the security and integrity of assets.
- Independent and dedicated network that guarantees availability.
- The telecommunications services necessary for the operation of gas pipelines, other gas infrastructure and, in general, work centers are located very far from urban centers and therefore without operator coverage, are supplied with Enagás fiber.
- Enagas sells the surplus fiber optics through a joint venture called Axent.

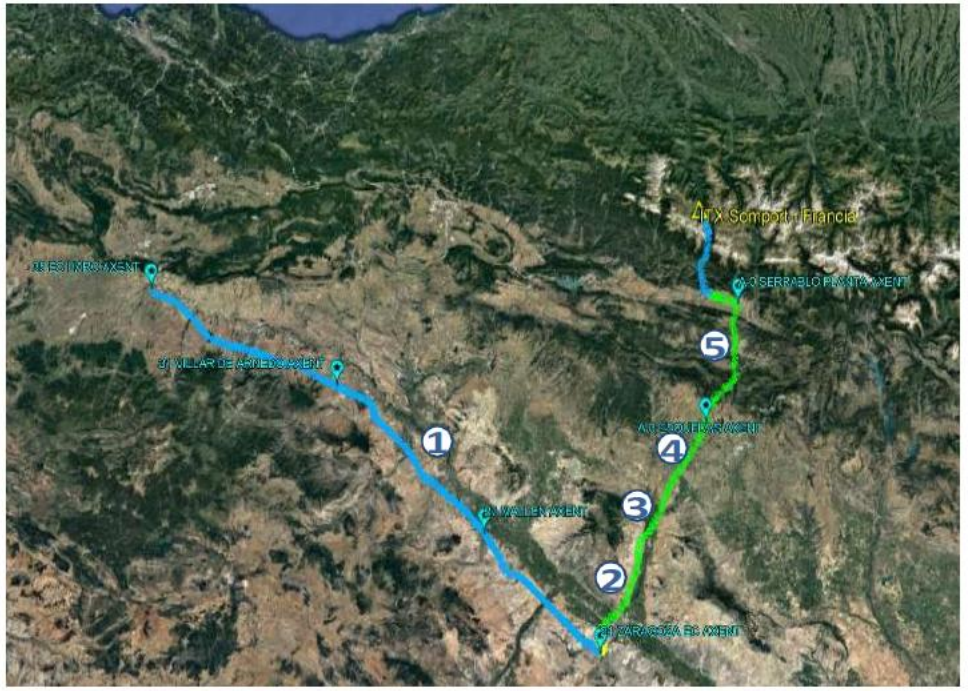


THE AVATAR II PROJECT

Project length: 400km
Fiber counts: 432, 576 & 864
Drums of 4km
Cable delivered in 5 months
Client custom design



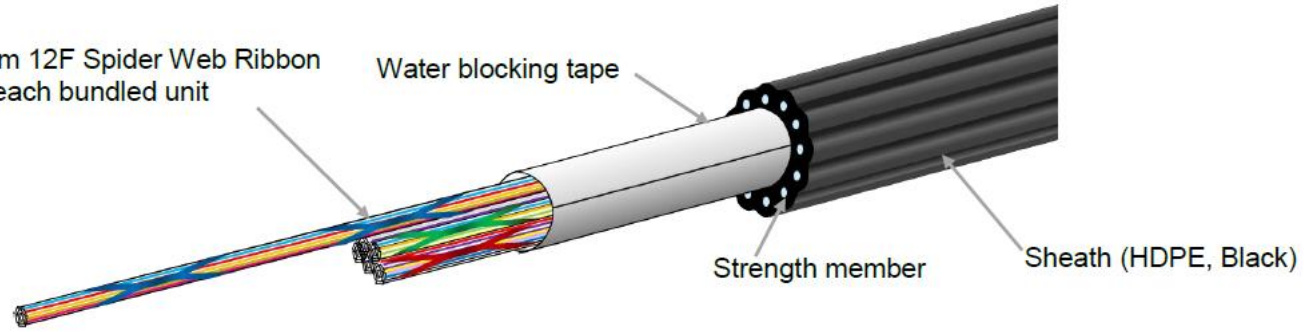




Project highlights

Air Blown Wrapping Tube Cable (AB WTC) design

- Fujikura AB WTC cable construction



- 432f, 576f and 864f designs supplied

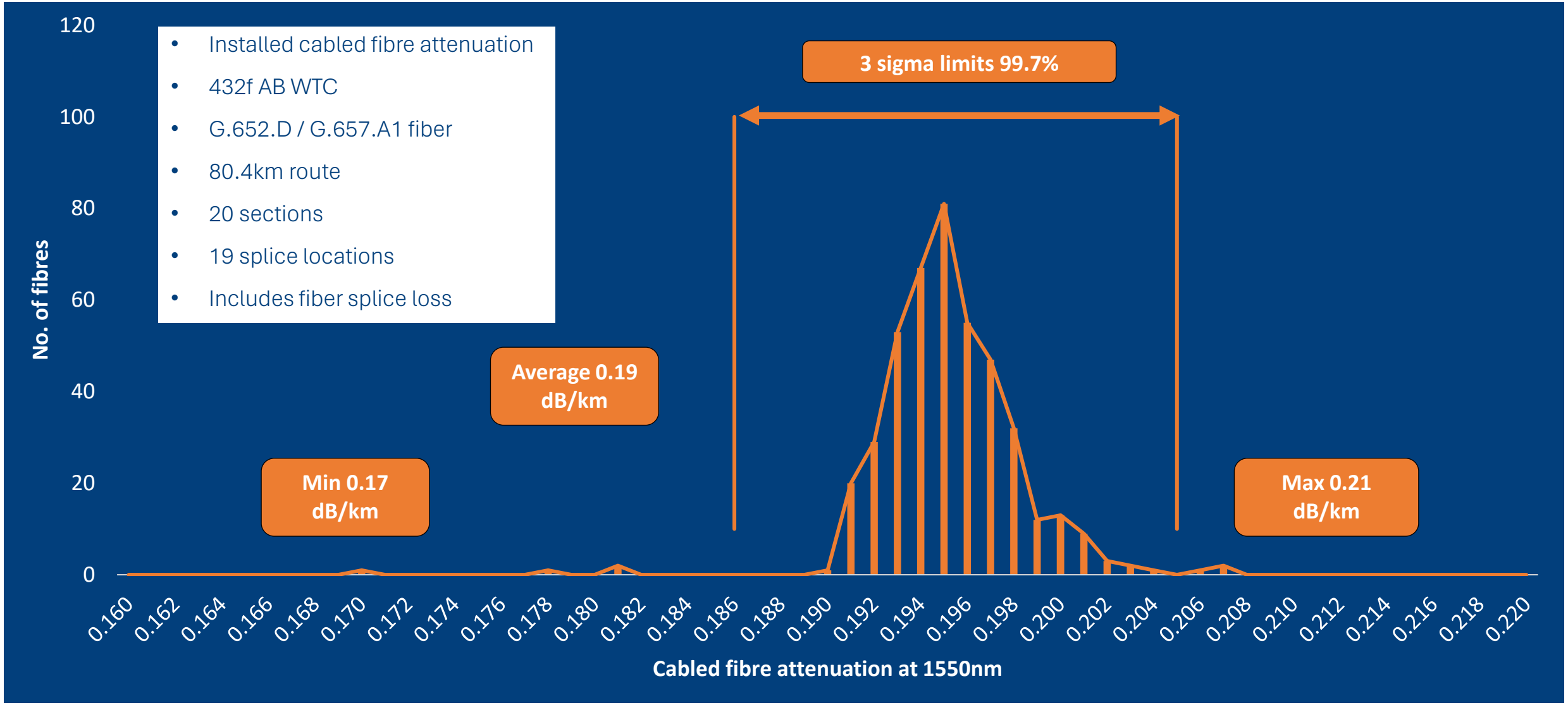
Fiber count		432F	576F	864F
Stripe ring mark no.		1-6		
Fibers per bundled unit		72F		
Number of bundled unit		6	8	12
Cable diameter*4	mm	11.6 ± 0.3	12.8 ± 0.3	14.3 ± 0.3
Cable weight (in approx.)	kg/km	95	115	145

- **Blown into 40 / 35.2mm ridged duct**

432f installed link loss – 80 km section

- Installed cabled fibre attenuation
- 432f AB WTC
- G.652.D / G.657.A1 fiber
- 80.4km route
- 20 sections
- 19 splice locations
- Includes fiber splice loss

432f installed link loss – 80 km section



Telcos no longer leading investment

Even if fiber is more needed & than ever before, investment is clearly moving away from Telco / FTTX to other sectors, like DC and DCI:

- Energy distribution (Electricity / Gas / Solar / Wind)
- Railways / Transit
- Highways / Waterways
- Critical Infrastructures
- Defense





Right of way: The legal right, established by usage or grant, to pass along a specific route through grounds or property belonging to another (Oxford dictionary)

Right of Way + Fujikura: The perfect combo

Advantages of the “right of way” vs digging elsewhere



- No physical or political barriers (even cross-border)
- Long distances and optimized paths
- Limited civil works
- Limited risk of breaking cable accidentally
- Ducts and/or troughs often available
- Connecting cities centrally..
- ...but also reaching rural/remote locations (close digital divide gap)
- Installation workspace available

Fujikura has the best fiber and cable technology for a fast installation, low attenuation and small diameter high fiber count cables

The race for additional backbone networks

Companies outside of telco business, especially those with historic “rights of way” are discovering the benefits of dark fiber networks. Dark fibers are used as an additional revenue stream with several business models possible:



- Direct - by creating own companies or branches
- Wholesale
- Neutral hosting
- Own telecom services (“Railcom”)





CONCLUSION

Why ribbon is the new standard

Operational benefits

- Small diameter & low weight
- Clean, dry cable design (no gel)
- Mass fusion splicing
- Manufactured in long lengths for versality in deployment
- More sustainable and with a reduced carbon footprint
- Reduced Mean Time to Repair (MTTR)

Cost savings

- 75%+ overall installation time saving
- Substantial operational savings
- Civils costs (significant)
- MTTR (penalties, reputation..)

Thank you

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Connecting you to a sustainable future
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