

Aerospace and Harsh Environment Fibre Optic Cable

EN Standards Preparation, Product Development, Manufacture, & Test

F. FORGET
Test House and R&D Quality Manager

Swindon, May 2010 the 18th
www.draka.com



1910 – 2010
**A 100-year heritage of
cable solutions & innovations**

Draka is a global leader in the development, production and sale of a portfolio of cables and cable solutions for a wide range of industries, customers and applications



Draka's Arctic Grade cable meets all cold bend and cold impact requirements for operation in extremely cold climates



Every day, Draka produces enough fiber to span the globe

With revenues of € 2.7 billion in 2008 we are the eighth largest cable manufacturer in the world and the number 3 in Europe

Operating from 90 locations in 32 countries on 4 continents

Draka powered through 3 groups

Energy & Infrastructure

Low- and medium-voltage cables, for your home and workplace, street and traffic lighting, railway security and communication networks



Industry & Specialty

Renewable energy, Marine, Oil and Gas, Elevator Products, Automotive & Aviation, Irrigation and Cranes, US Defense



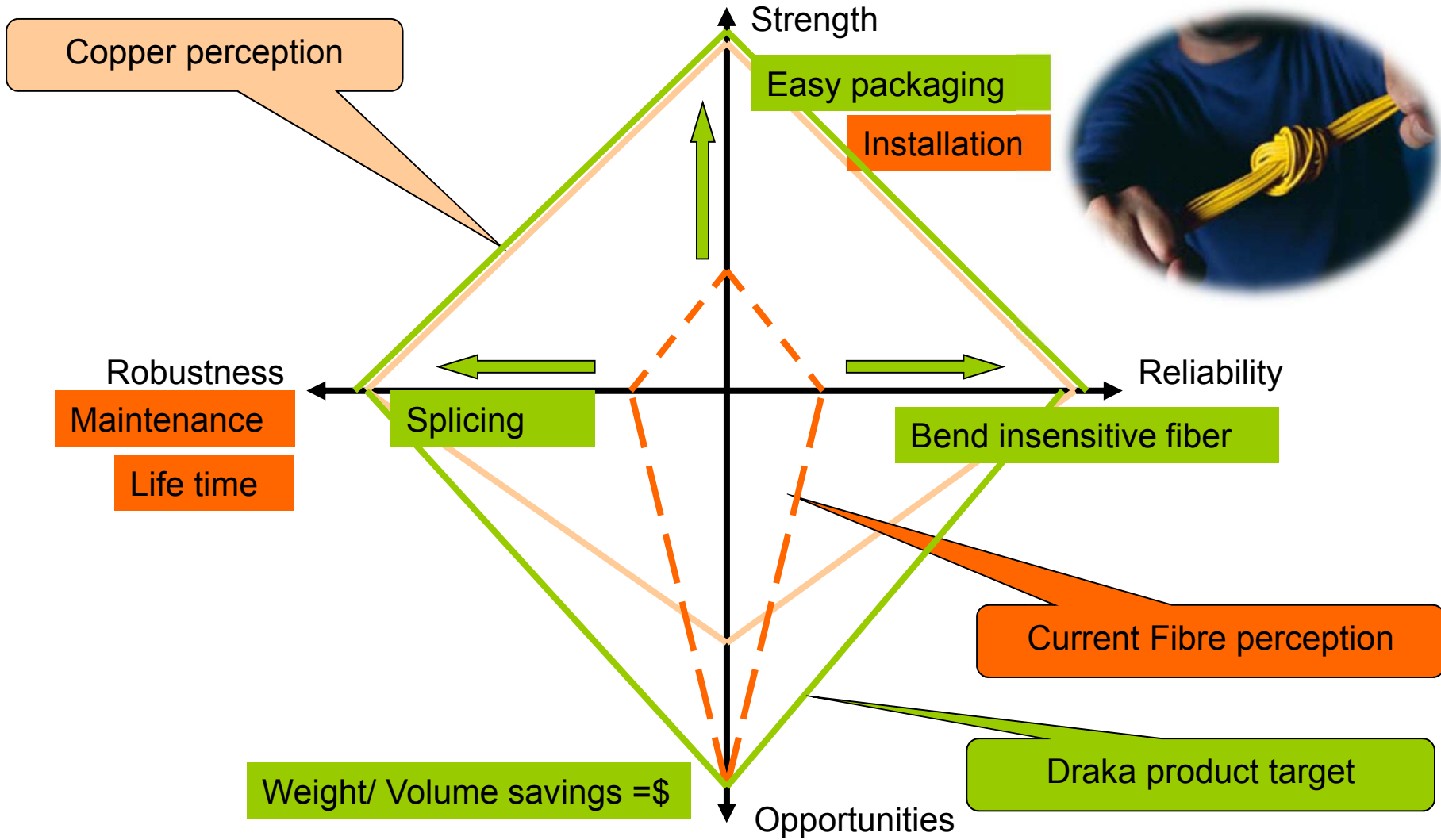
Communications

Copper and optical fiber cable solutions for telecommunications, data communications and multimedia specials



Draka Automotive & Aviation





- Future avionic, vetronic and civil platforms will specify more network based architectures.
 - Data rates will increase
 - Budget link become more important
- 1st step:
 - Demonstrate the optical infrastructure = right solution to answer the above insight
 - Apply copper cable design for harsh environment to FO cable
 - Standardize the FO cable environmental and performance requirements
- 2nd step:
 - Offer FO cables for a wide range of harsh environment





Draka

Continuous contribution to
FO cable Standards

SAE *International*

AE 8A/8D



AeroSpace and Defence
Industries Association of Europe

S2 D2 & S2 D10

ARINC
DEDICATION BEYOND EXPECTATION

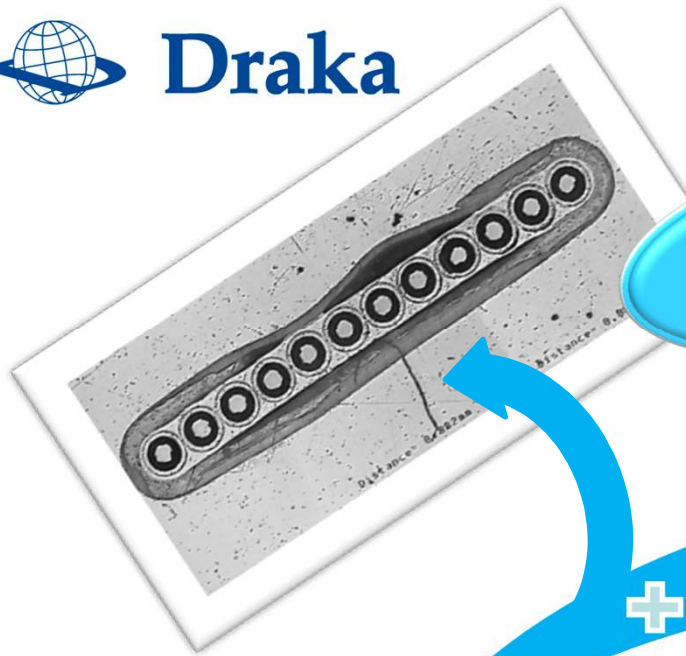
600 & 800 series





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Key Benefits

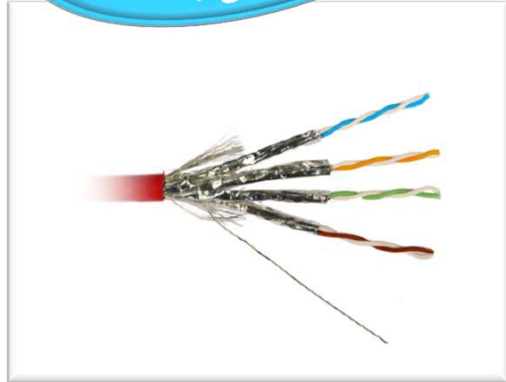


10 kg/km



5 kg/km

From 40 to 70 kg/km





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Our approach

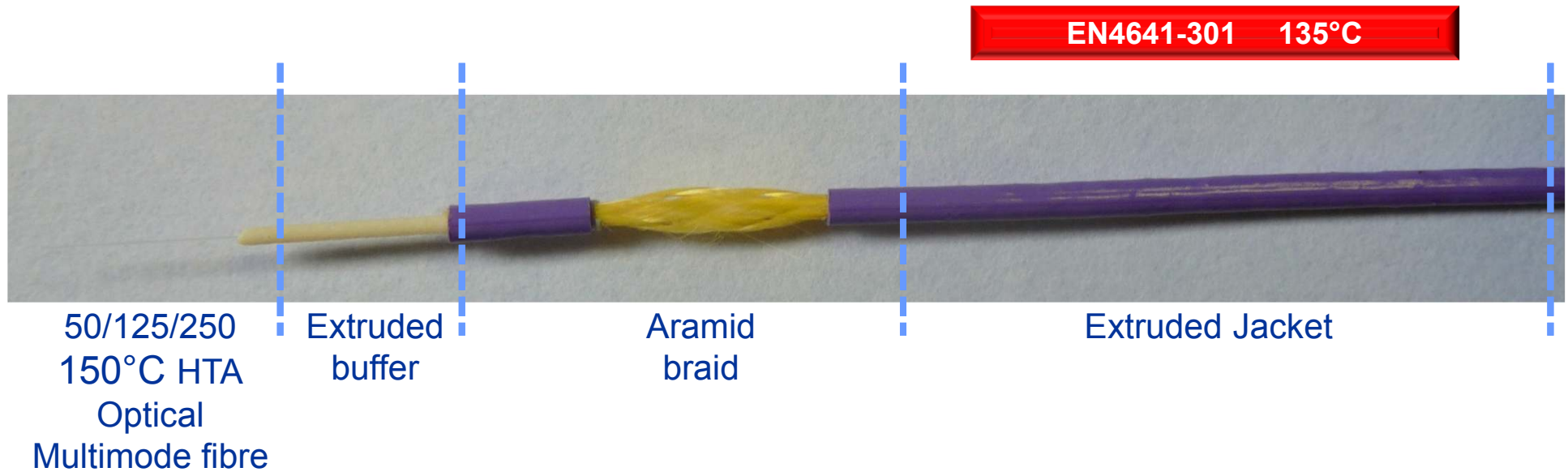
Draka Fileca **40** years of experience in cable technology for Aviation & Space

Draka Communication experience in fibre optics development and production

- Fluids resistance
- Smoke & toxicity low level
- Low shrinkage
- Mechanical resistance
- Temp. cycling resistance

Main harsh environment constraints for Aviation cable

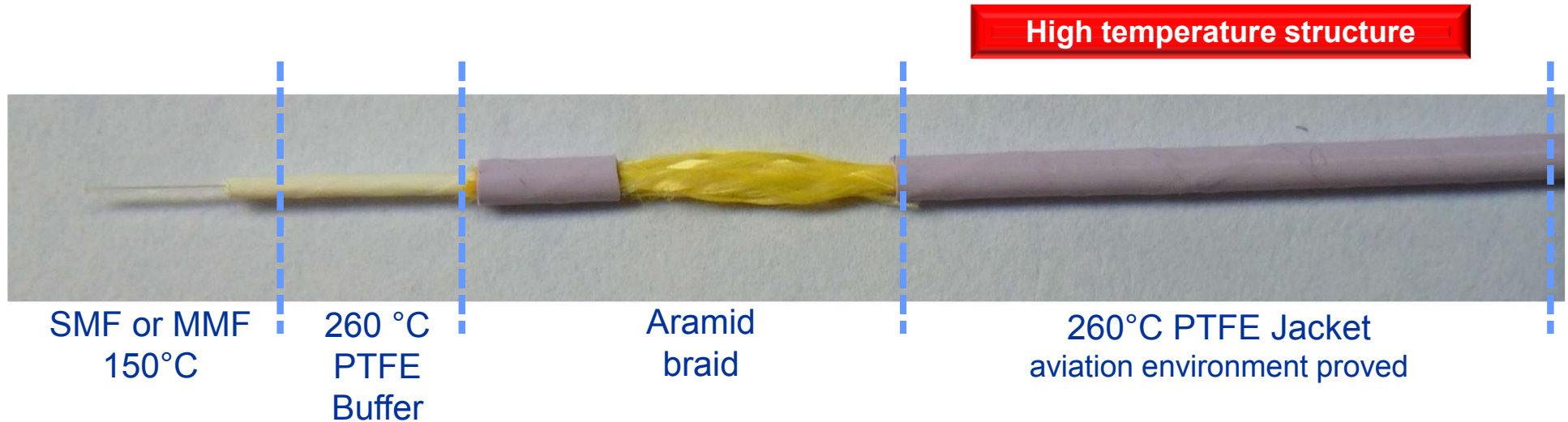
Draka harsh environment fibre optic cable for Aviation



Main characteristics:

- Ø : 1.8 mm
- Weight : 5 kg/km
- Temp rating : -60 to +135°C
- @ at 850nm : < 5 dB/km
- @ at 1300nm : < 3 dB/km
- Bandwidth : > 1000 MHz/km
- Minimum bend radius : 20 mm
- Cable tensile strength : > 200 N

Draka value proposal



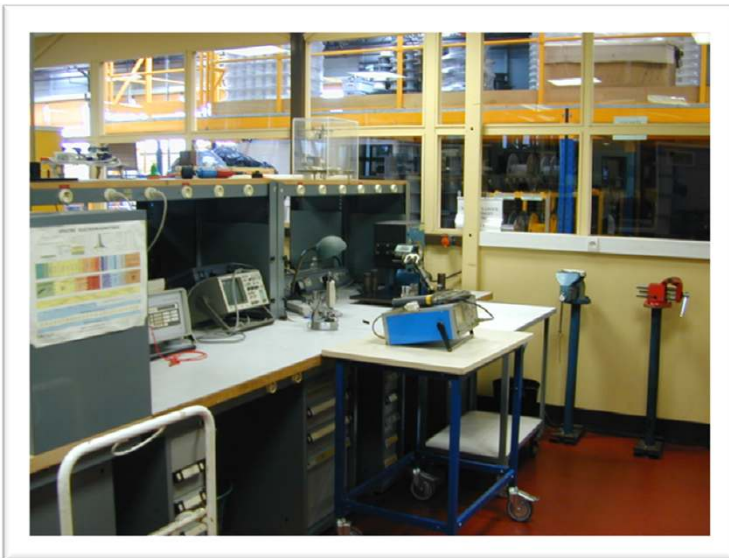
Main characteristics: (customisable upon request)

- Ø : 1.8 mm
- Weight : 5 kg/km
- Extended Temp rating : -65 to $\geq 260^{\circ}\text{C}$ (under dev)
- @ depending on fibre core
- Bandwidth depending on fibre core
- Minimum bend radius : < 20 mm
- Cable tensile strength : > 200 N



Our laboratory has the test capabilities to test products on:

- Electrical
- Mechanical
- Physical – Chemical.



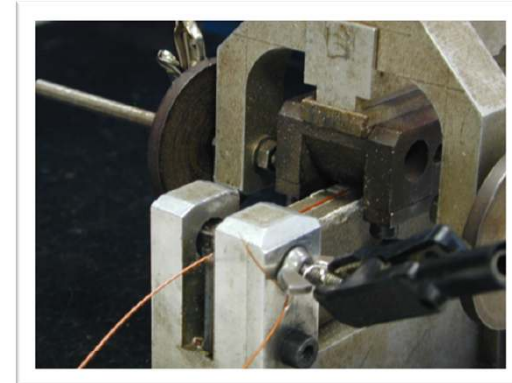
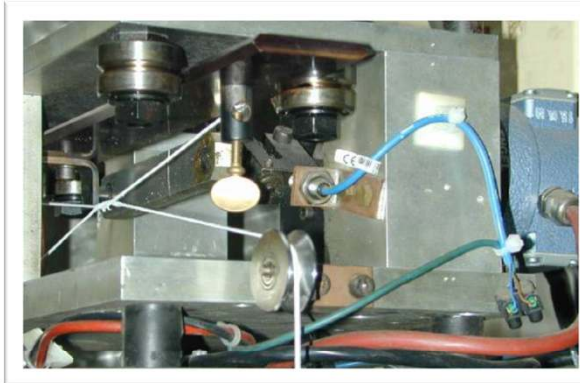
Following EN3745 and other standard test method



- OTDR
- Insertion loss
- Temperature cycling

Abrasion resistance:

- Wire to wire
- Scrape abrasion



Fatigue test:

- Alternate bending,
- Torsion

The tensile testing:

- Pull resistance
- Stress,
- Maximum Elongation.





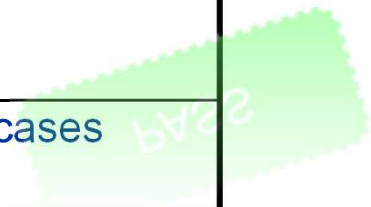
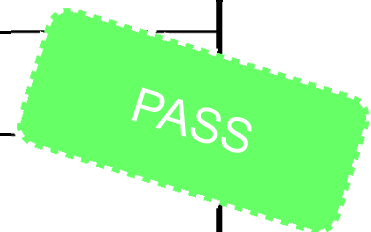
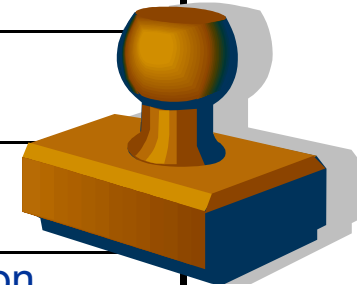
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Qualification Test Capabilities

- Insulation performance in humid atmosphere.
- Climatic cycles (hot, cold, moisture...).
- Cold bend test.
- Temperature Shock.
- Insulation Resistance to Fluids (acid, bases, hydraulics fluid, skydrol, kerosene, solvents, etc...).

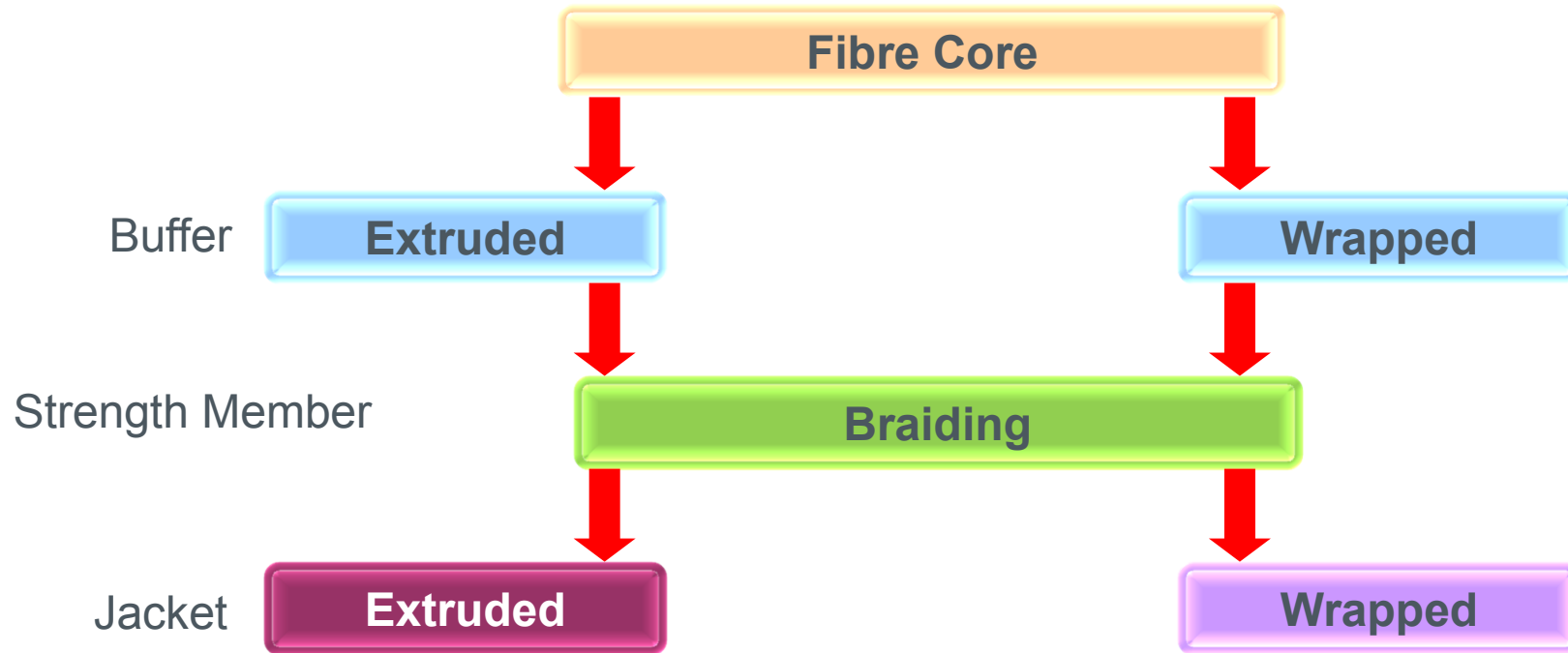


Attenuation	Guarantee the Quality of the Optical link
Flexure endurance	Resistance to the mechanical stress during and after installation
Impact Resistance	Resistance to mechanical shocks
Jacket shrinkage	Ease to terminate
Crush load	Attenuation loss due to crush during and after installation
Fluids Resistance	Resistance to Aeronautic fluids
Smoke & Toxicity	Low smoke and toxicity level
Flammability	No flame propagation
Temp cycling	Ability to maintain the high optical performance in all cases



- Fibre
 - Draka offers wide range of buffered fibre
 - Bend Insensitive
 - Singlemode
 - Multimode
 - High temperature

- Protection
 - Strength member
 - Give the right mechanical resistance
 - Limits the micro/macro bending to avoid extra losses
 - Jacket
 - Wrapped or extruded according to customer requirements



Several combinations and customizations
can be offered
to meet customers requirements
in harsh environment applications

in harsh environment applications



Thank you for your attention

Come and see our solutions at the exhibition