

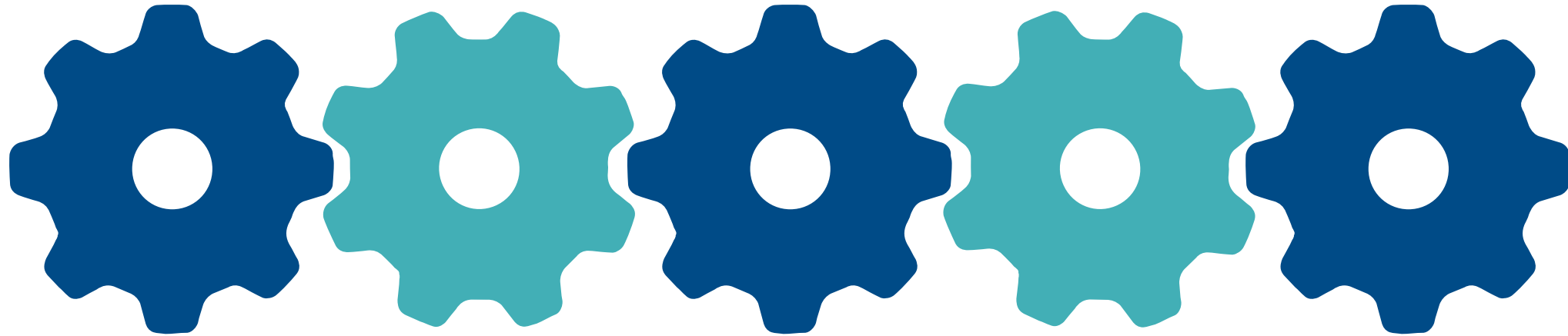
PAWEŁ JANOWSKI
AREA SALES MANAGER

CONNECTIVITY
THE MATCHING
MAKES A DIFFERENCE!





WHO ARE WE?



A family company,
over 30 years
in the
telecommunication
business

Own production
facilities,
warehouses and
offices located in
central Poland

Own R&D
Department,
Design Office
and Training
Center

Official partner
of Swiss
company
DIAMOND SA

A member
of the FTTH
Council Europe



OUR OFFER

STANDARD PORTFOLIO PRODUCTS

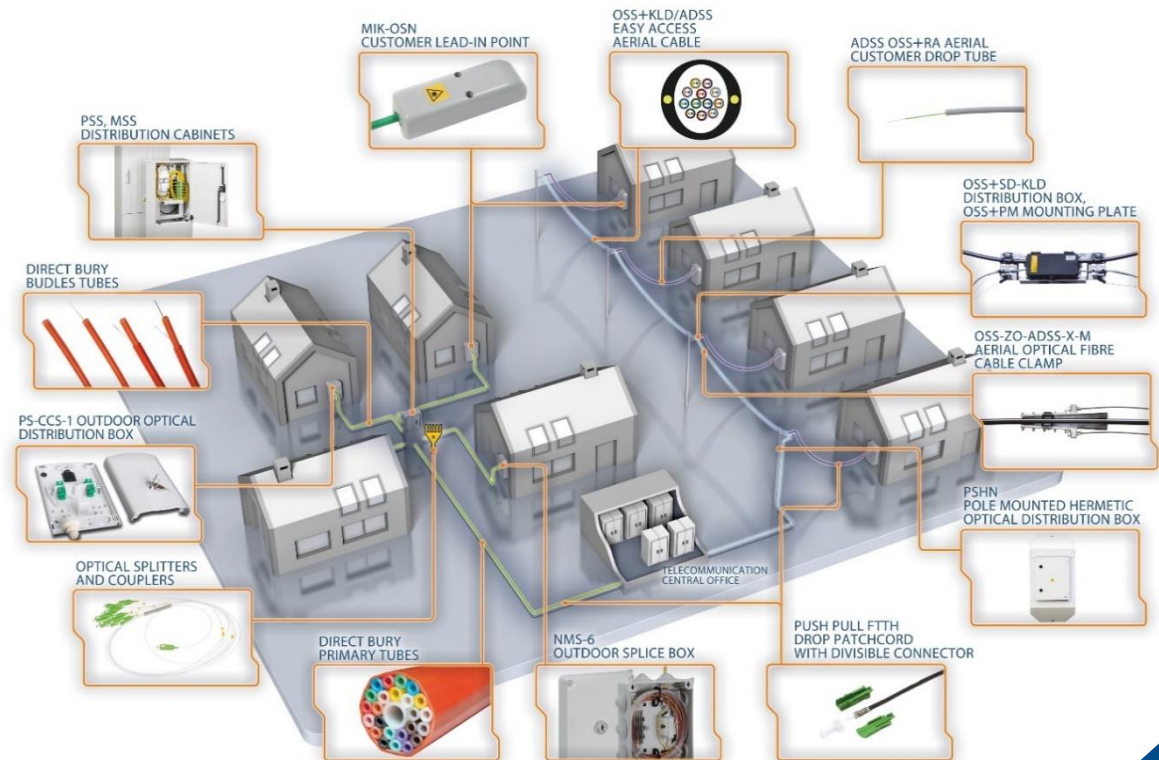
FULL SOLUTIONS

CUSTOM MADE PRODUCTS

SINGLE COMPONENTS

TRAINING COURSES

COMPLETE SUPPORT (BEFORE, DURING, AFTER)





OUR FACTORY

TELECOMMUNICATIONS EQUIPMENT PLANT



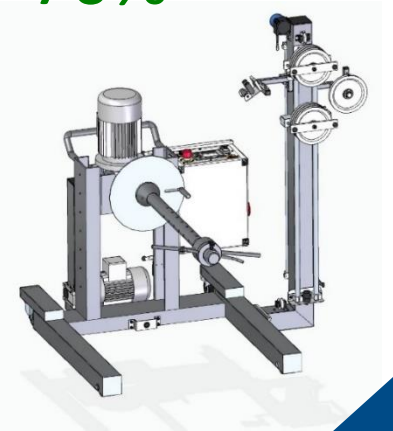
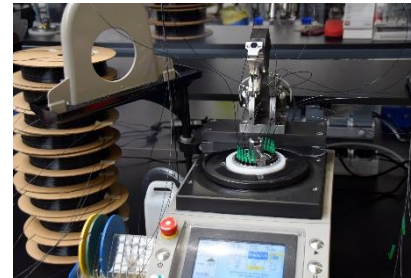
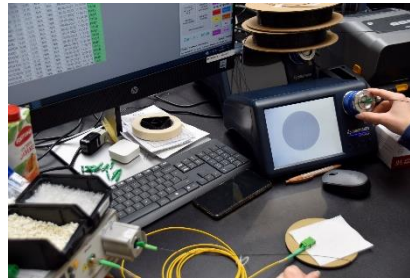
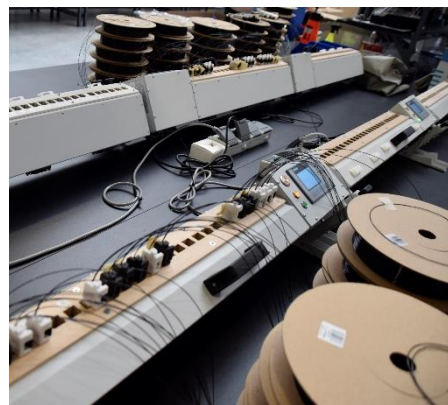


OUR FACTORY

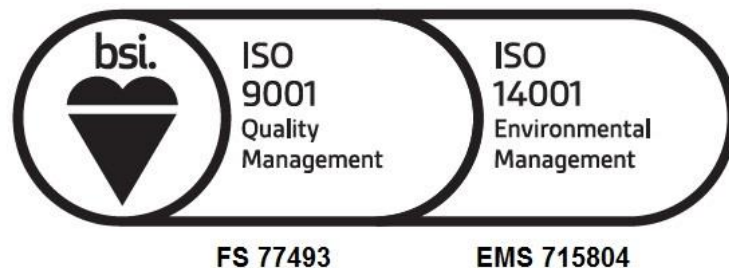
FIBRE OPTIC CABLE CONNECTORISATION PLANT

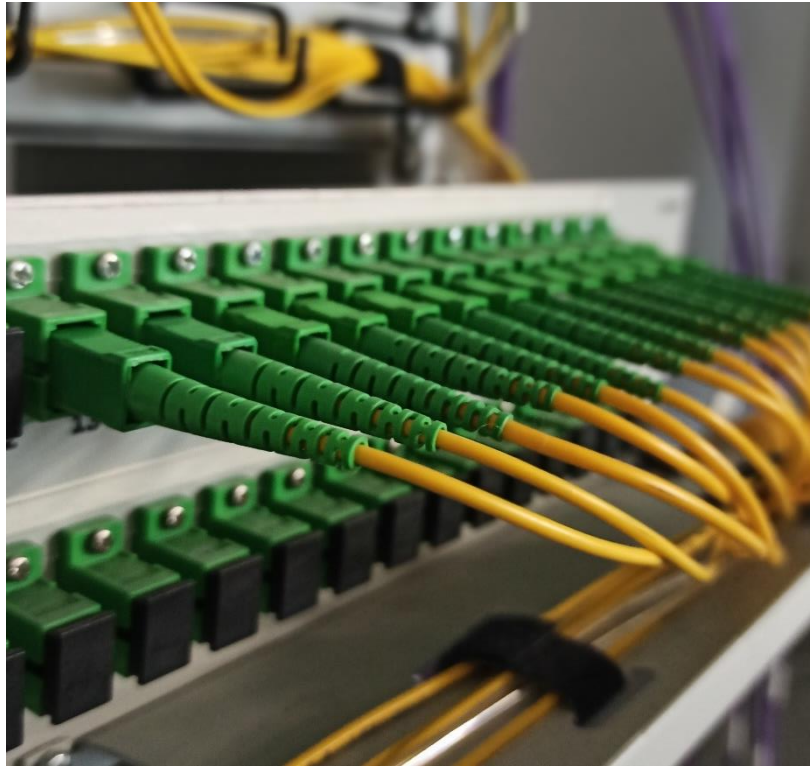


70%

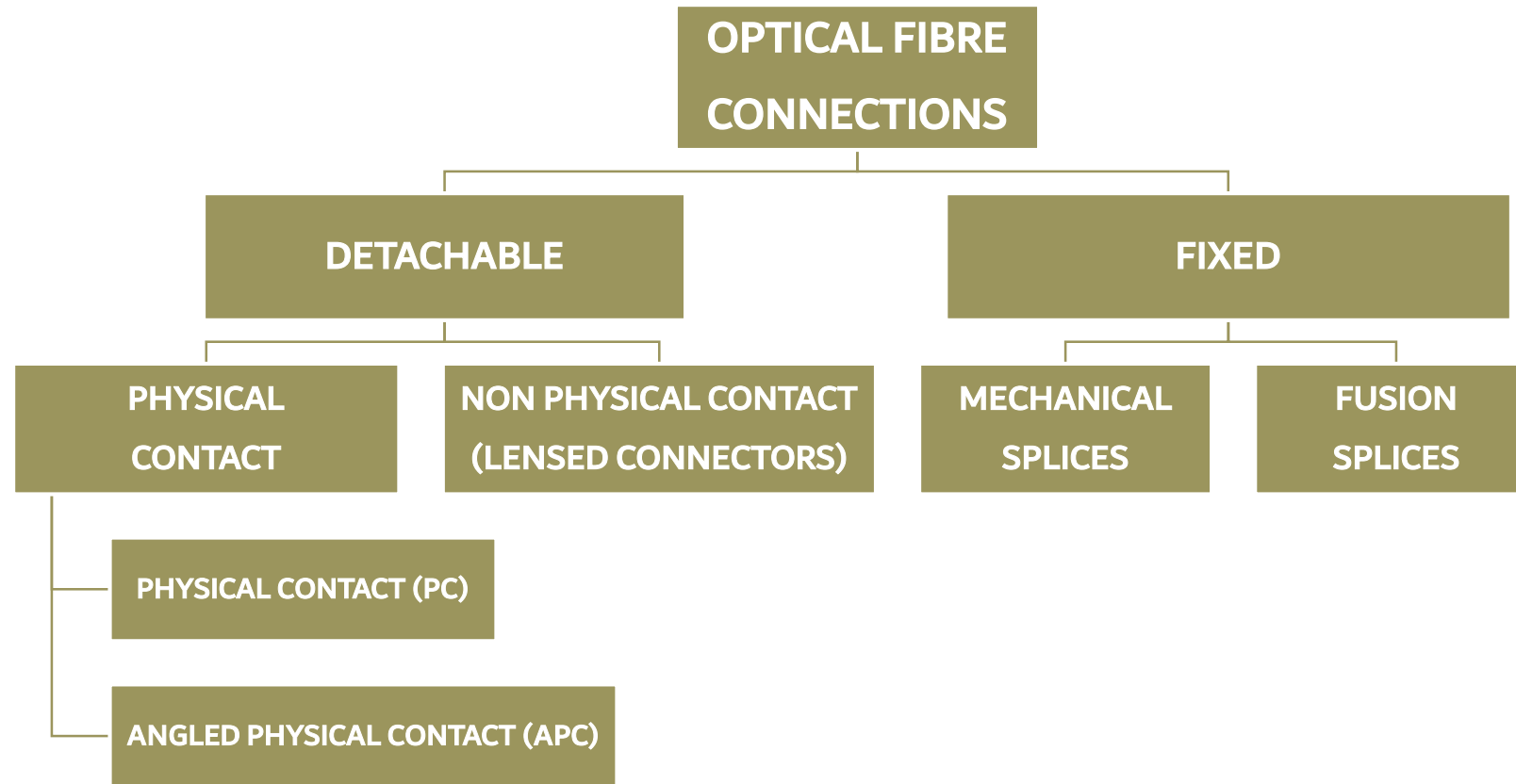


- **2 plants** in operations
- almost **6500 m²** manufacturing, warehousing and office space
- over **160 employees** (roughly 10% R&D),
- more than **€10M** annual turnover
- capacity – up to **50 000 fibre optic connectors** per week
- circa **100 prototypes designed** per year





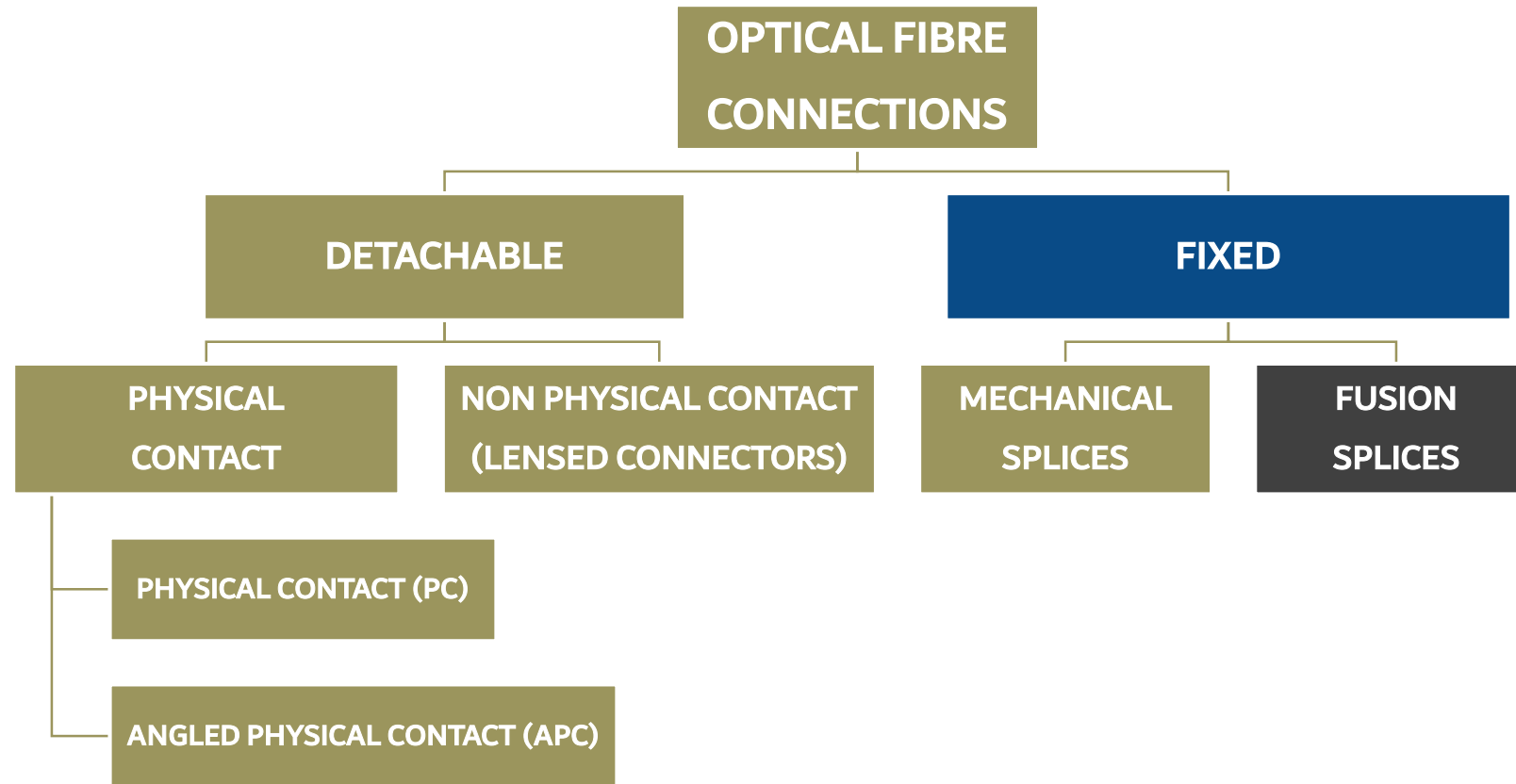
- Fibre connection methods – a drop of theory
- Connectors – selected standards
- Basic analysis of optical fibre connection methods and the most common connector standards
- Selected connectivity solutions
- Summary





FIBRE CONNECTION METHODS

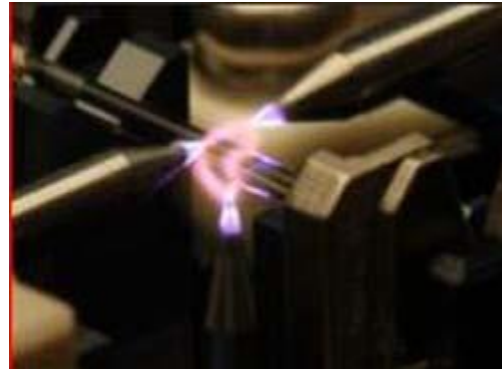
DROP OF THEORY





FUSION SPLICES

MAIN CHARACTERISTIC



**MELTED AND FUSED
IN ELECTRIC ARC**

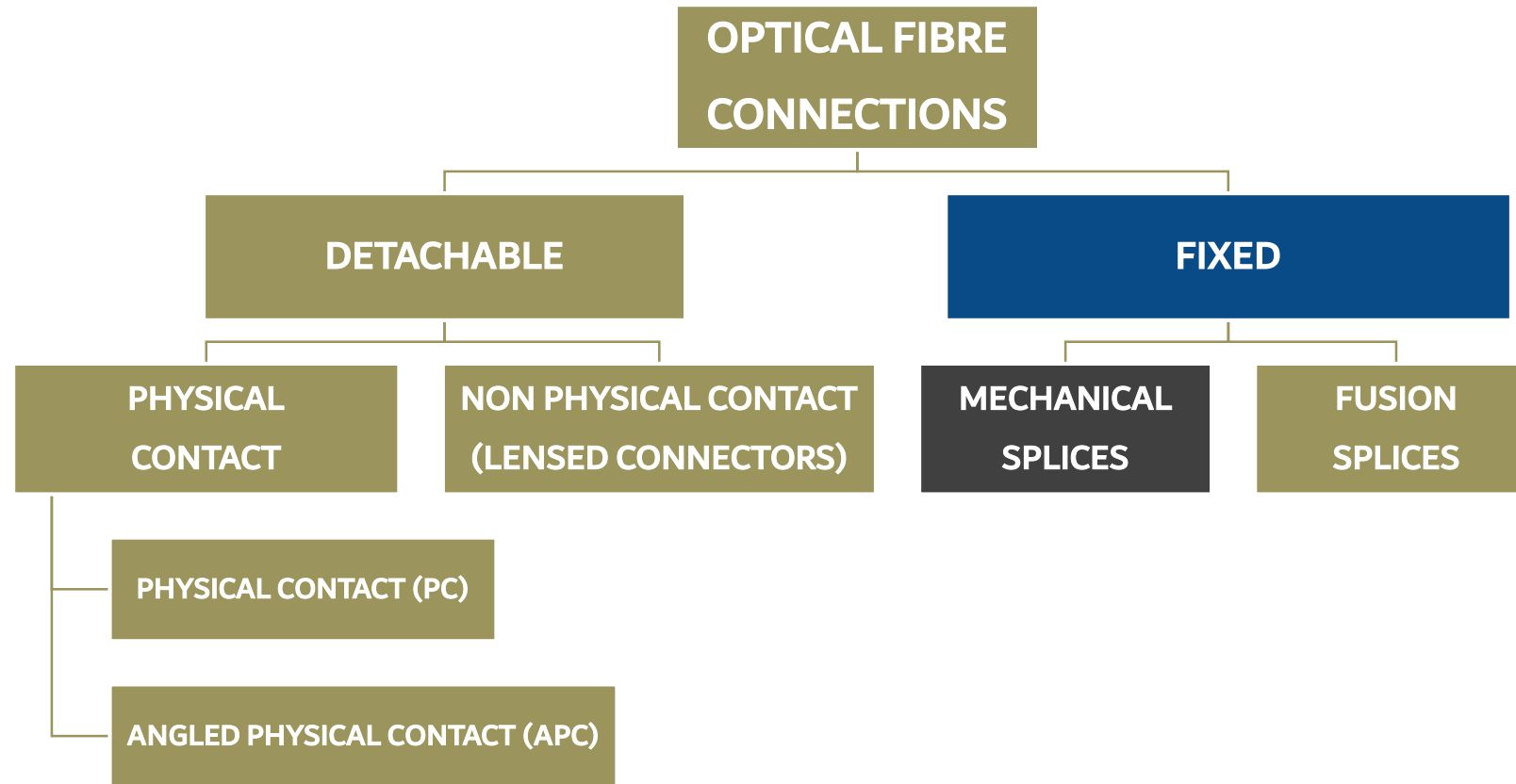
**VERY LOW IL
(INSERTION LOSS)**

**ALMOST NO
REFLECTION –
VERY HIGH RL
(RETURN LOSS)**

**PERMANENT AND
UNCHANGING
OVER TIME**

**NO POSSIBILITY
TO CONNECT A MEASURING
INSTRUMENT IN THE
SPLICE/CONNECTION POINT**

Recommendation: first choice solution for fixed connection.





MECHANICAL SPLICES

MAIN CHARACTERISTIC



JOINED IN THE V-GROVE
FILLED WITH INDEX
MATCHING FLUID

INDEX MATCHING
FLUID BETWEEN
FIBRES (GEL)

NO SPLICING
MACHINE

HIGHER IL
(INSERTION LOSS)

QUICK
INSTALLATION

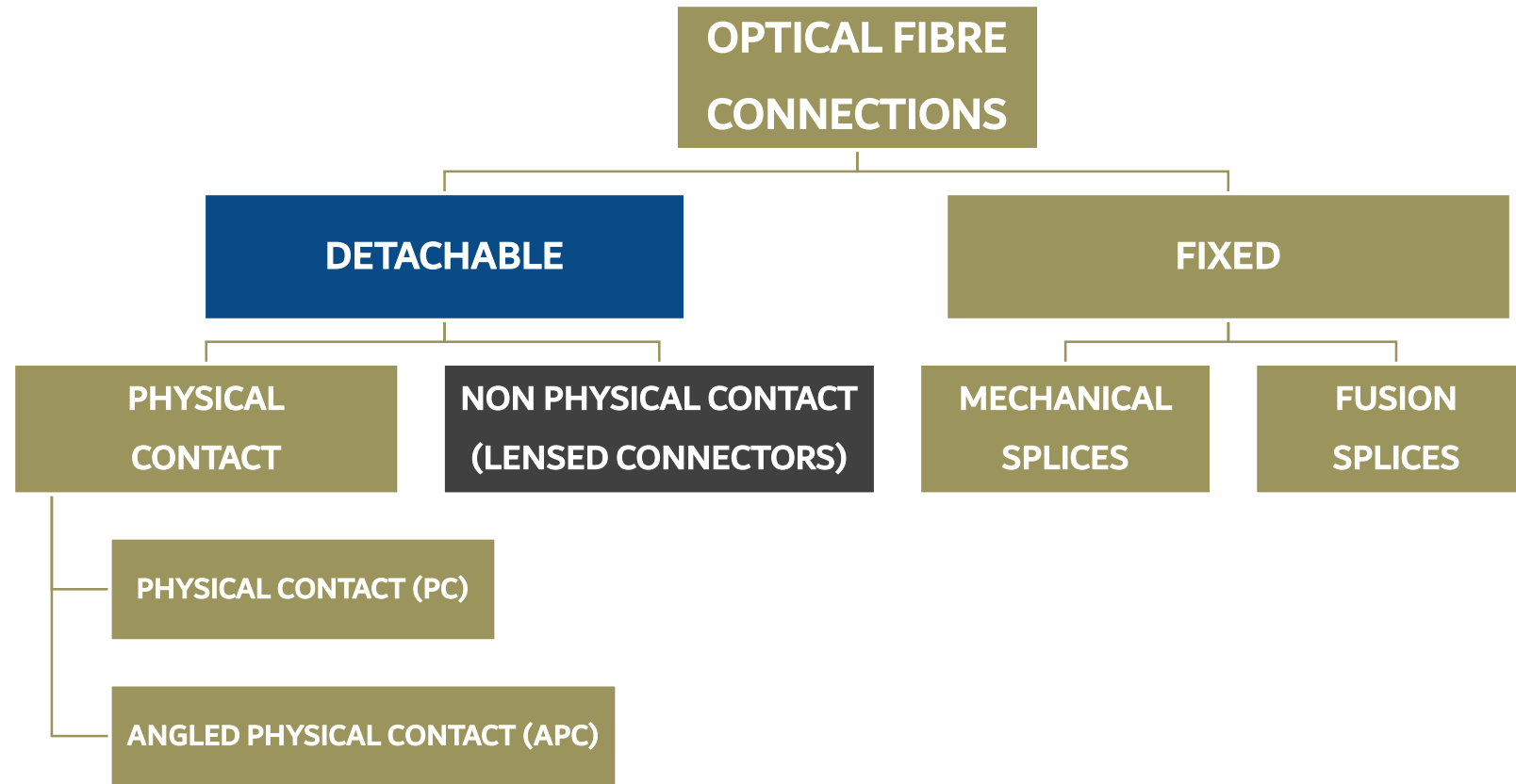
DEGRADATION OF
PARAMETERS OVER TIME

Recommendation: great temporary solution.



FIBRE CONNECTION METHODS

DROP OF THEORY





NO PHYSICAL CONTACT

MAIN CHARACTERISTIC



**LIGHT TRANSFERRED BETWEEN THE
FIBRES THROUGH LENSES – NO
CONTACT**

**LOWER RL
(RETURN LOSS)**

**HIGHER IL
(INSERTION LOSS)**

**GREATER RESISTANCE
TO DIRT**

**GREATER RESISTANCE
TO HIGH POWER**

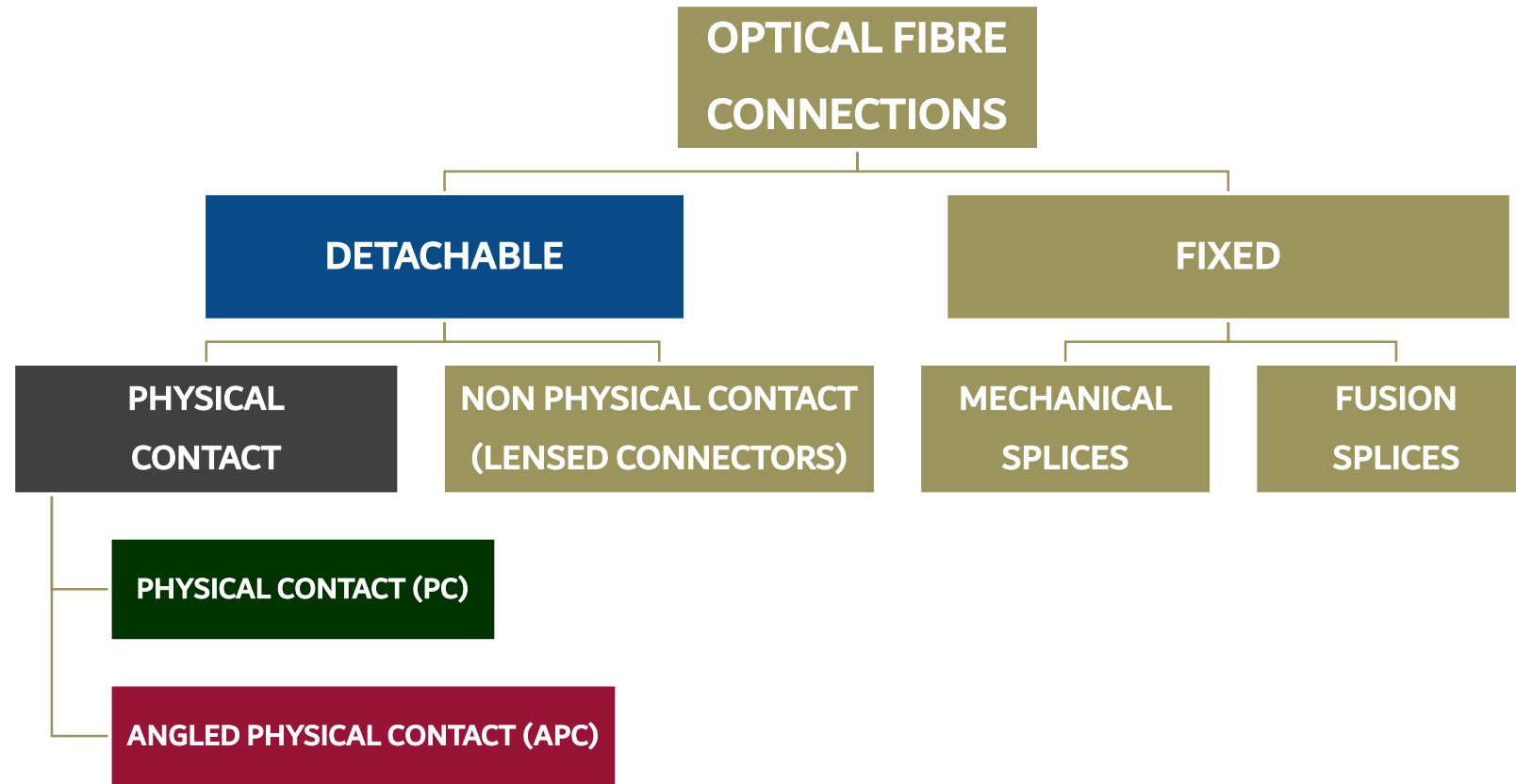
**GREATER RESISTANCE
TO DAMAGE**

Recommendation: field and industrial environment.



FIBRE CONNECTION METHODS

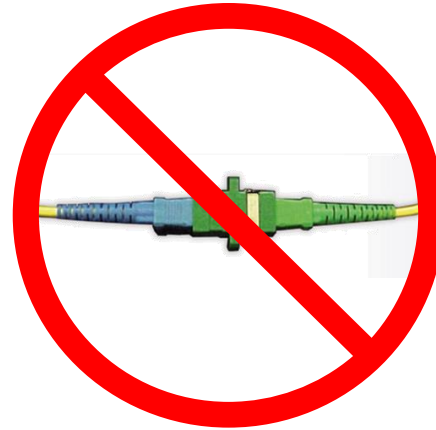
DROP OF THEORY








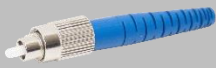




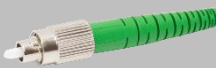





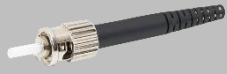

PHYSICAL CONTACT

MAIN CHARACTERISTIC



LIGHT TRANSFERRED DIRECTLY THROUGH PHYSICALLY CONTACTING	LOW IL (INSERTION LOSS)	HIGH RL (RETURN LOSS) – HIGHER FOR APC	LOWER RESISTANCE TO DIRT
	LOWER RESISTANCE TO HIGH POWER	LOWER RESISTANCE TO DAMAGE	POSSIBILITY TO MEASURE THE NETWORK SIGNAL ON THE CONNECTION

Recommendation: in most of the areas, require appropriate conditions – common choice.

	CONNECTORS					
	E-2000	SC	LC	FC	ST	MTP
SM/PC						
SM/APC						
MM						
Comments	Excellent parameters, integral protection shutters	The most common standard	High-density networks 2*LC=SC/E2000 footprint	Used in high-vibration environments. Connector with a threaded connection.	Still in usage however successfully replaced by SC	Data Centers



CONNECTIVITY - CONCLUSIONS

FROM NEEDS TO IDEAS

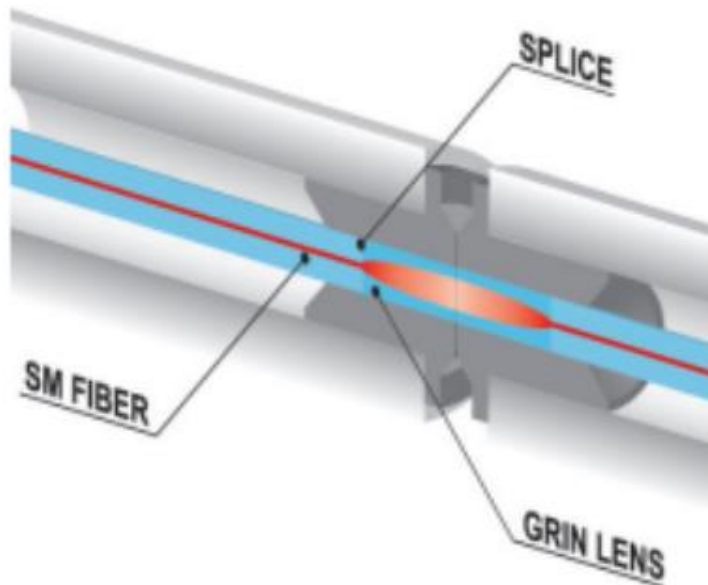
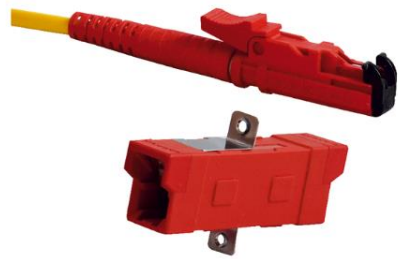


- Speed up installation process
- Create network flexibility
 - Connect/unconnect
- Measure network signal if it's required
- Minimize capex for installation equipment
- Reduce skill set and training time for your workers
- Optimize network parameters



PHYSICAL CONTACT

E-2000 PS DIAMOND

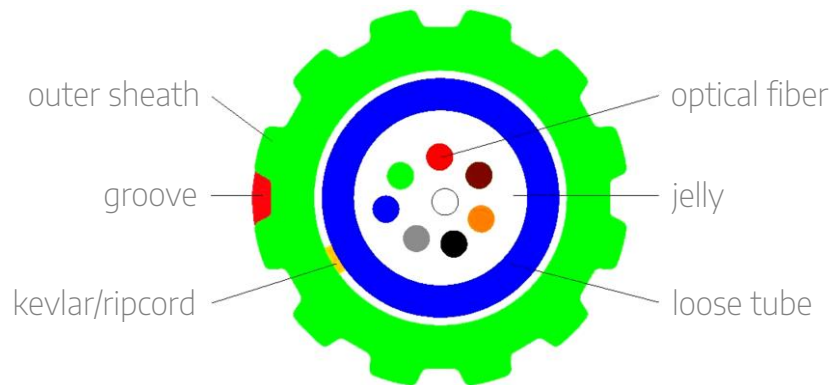


- Lower IL (Insertion Loss)
- Higher RL (Return Loss) – PC and APC versions
- Greater resistance to:
 - High power
 - Dirt
 - Damage
- Singlemode fibre spliced with graded-index fibre
 - Singlemode fibre – 9 microns fibre core
 - Graded index fibre – 40 microns fibre core
 - Expanded beam
 - Lower power density



PUSHABLE PATCHCORD

TOOL-FREE CONNECTION

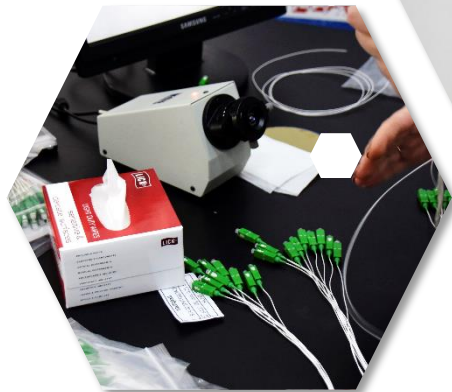


- Installation – quick and easy
- No tools
 - no blowing
 - no splicing
- Push to meet the destination
- Connector
 - OPTOMER'S divisible SC connector
- Cable
 - HDPE groove outer sheath
 - 2.5 mm OD
 - G657A1 fibre
- Testing parameters
 - 10/6 mm microtube (no pullcord)
 - over 100 m pushable distance (1 x 180 degrees bend)

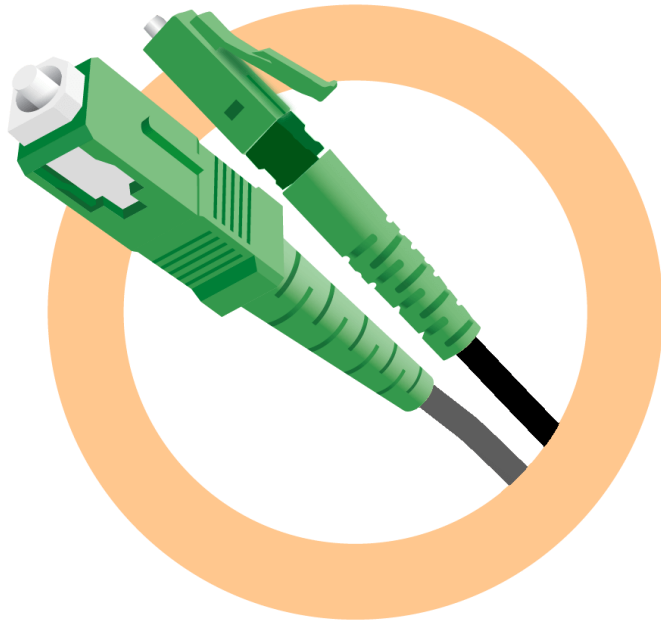


OPTOMER CONNECT SYSTEM+

FROM TWO PLANTS INTO COMPLETE SOLUTION



- The family of fully-equipped products with preinstalled:
 - adapters, pigtails, splitters, WDMs & more...
- The list of fully-equipped products is almost unlimited
 - all products can be customized to meet customer requirements
- Full quality control of assembled products
 - measuring
 - cleanliness testing (microscope, camera)
 - cleaning (one-click cleaner tool, dedicater dust-free wipers)
 - double control

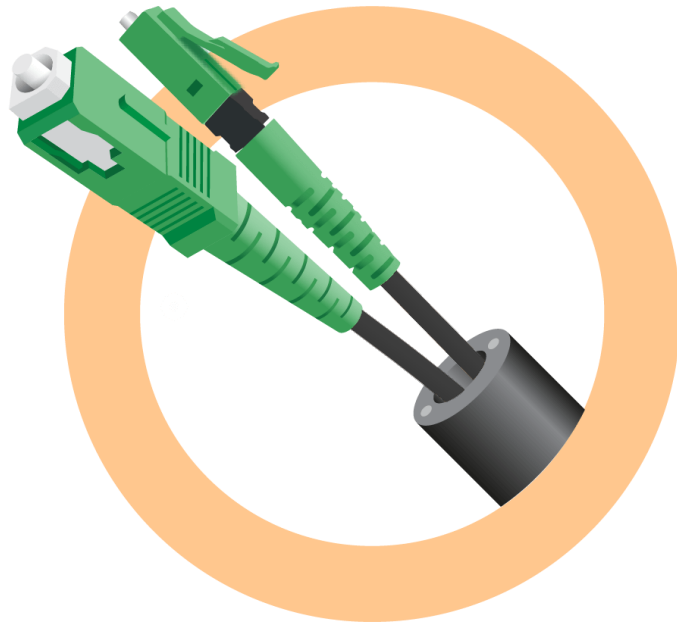


- Fibre units can be connectorised at one end or both ends
 - up to 4 fibre
 - OD 1.05 mm
- SC & LC connector options available
 - microtube ID 3.5 mm and higher
- Blowing distance from 25 m up to 1000 m
- No fibre splicing required for the customer drop
- Reduced skill set & training required for the installation
- Extremely small storage area for excess fibre
- Massively reduced capex for installation equipment



QWKCONNECT

FEEDED MICROCANALIZATION

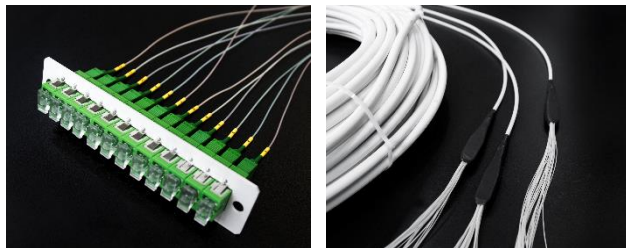
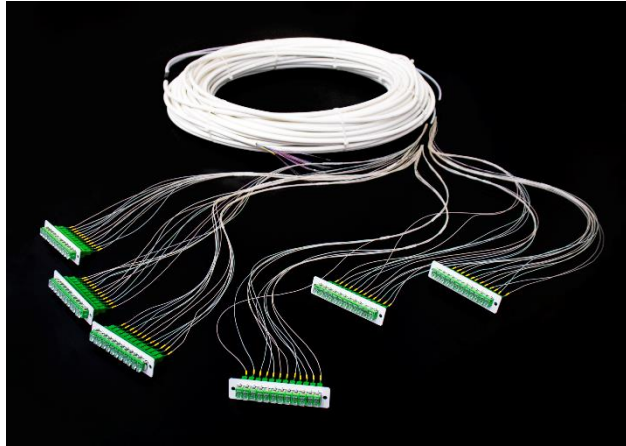


- Suitable for all network standards:
 - underground (direct-buried and ducted)
 - facade
 - aerial
 - indoor (CPR rating – up to Bca)
- Fibre units can be connectorised at one end or both ends
- SC & LC connector options available
- No blowing or fibre splicing required for the customer drop
- Reduced skill set & training required for the installation
- Extremely small storage area for excess fibre
- Massively reduced capex for installation equipment



MDU CONNECT SYSTEM+

SUITABLE PUZZLES

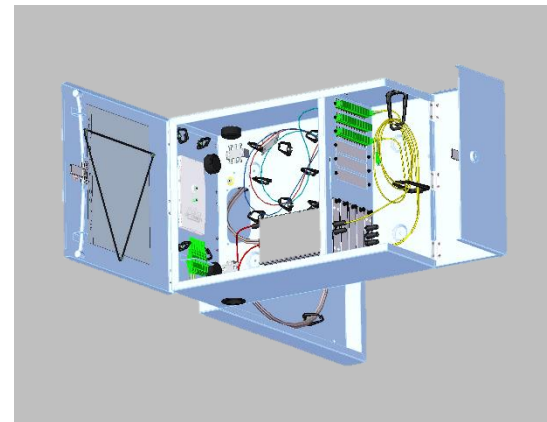
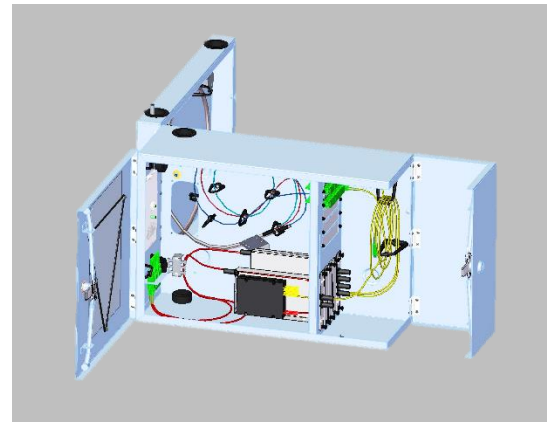
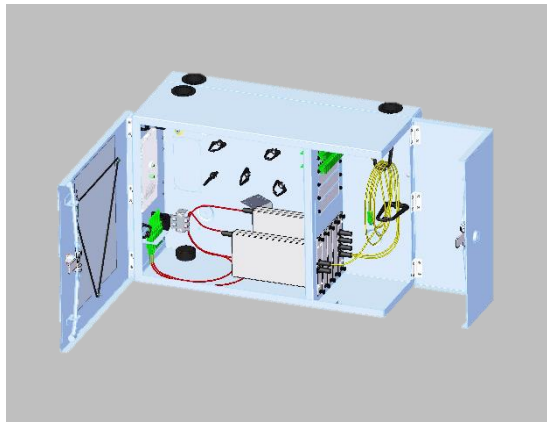
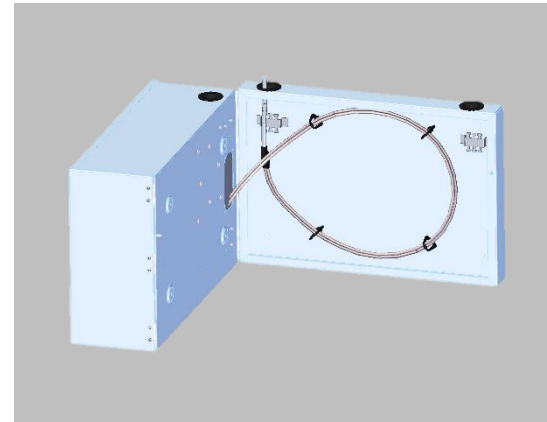
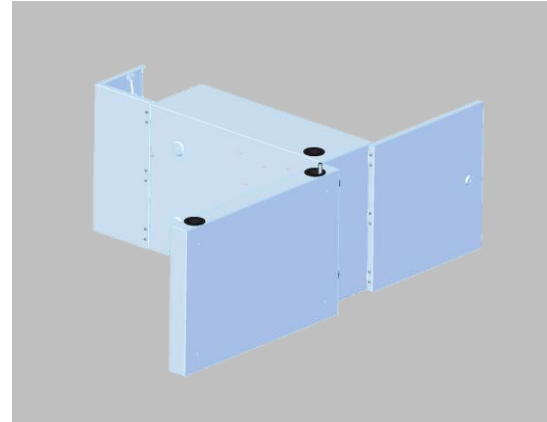
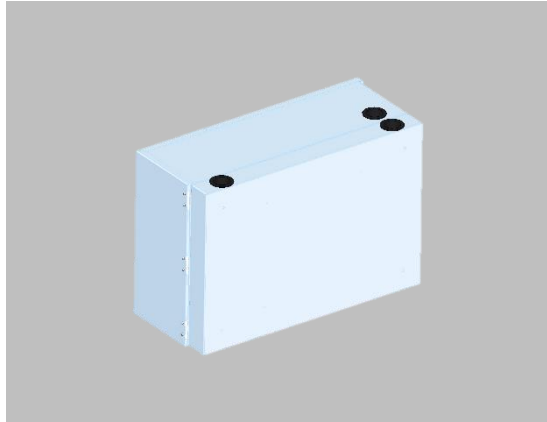


- Short BoM list
 - preconnected riser cable with preinstalled modules
 - indoor box with module frames
- No fibre splicing required on feeder cable side
- One riser cable can support many apartments on multiple floors
 - minimized the issue with limited space in existing ducting infrastructure
- Drop cables can be spliced with riser cable inside branch box (RKLD-12)
- Modules from riser cable can be pulled through microduct and fibres can be spliced with pigtails in optical outlet
- Cable capacity for trial
 - from 24fu (4*6fu) up to 144fu (24*6fu)
- Different capacity range of indoor boxes
 - from 36 subscribers up to 144 subscribers



MDU CONNECT SYSTEM+

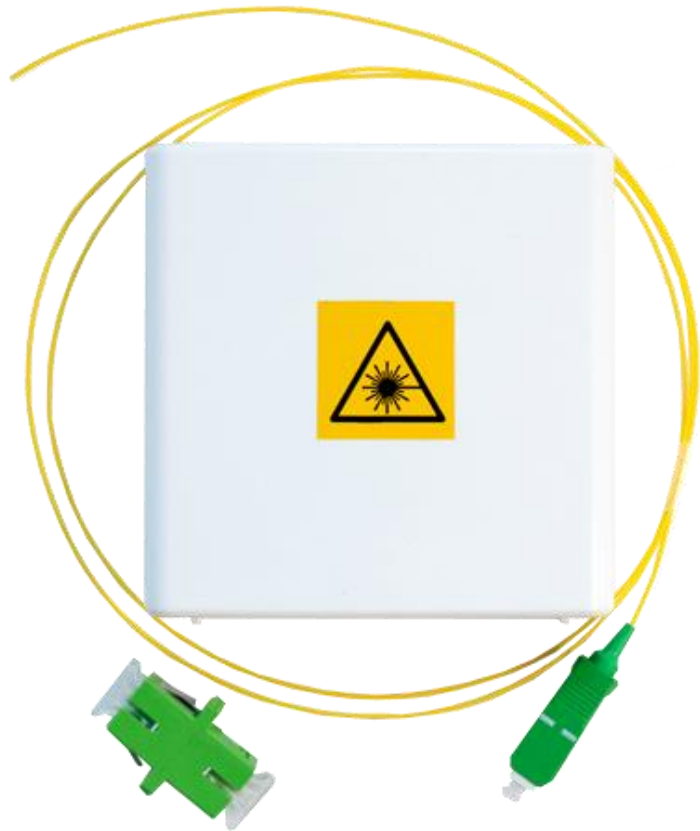
SUITABLE PUZZLES





„VISIBLE” OTO SET+

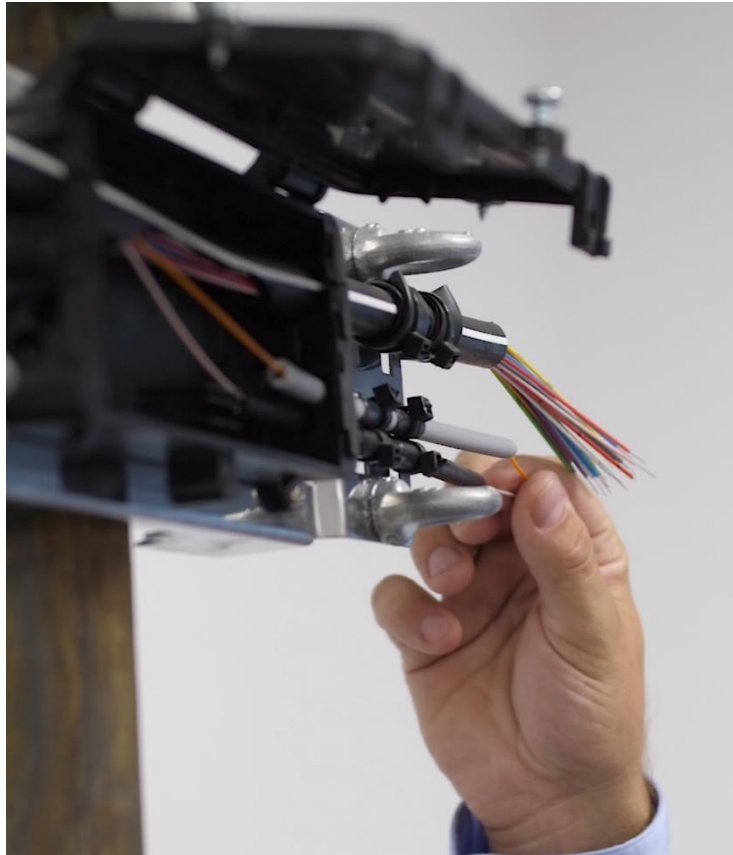
CONNECT & CONTROL



- Optical outlet with preinstalled cable – various options plus reflector or PC connector
- Higher visibility of network quality by centralized OTDR
- Possibility of live control for your assets value
- The same easy and smooth installation like for standard installers sets



OPTOMER – MISSION



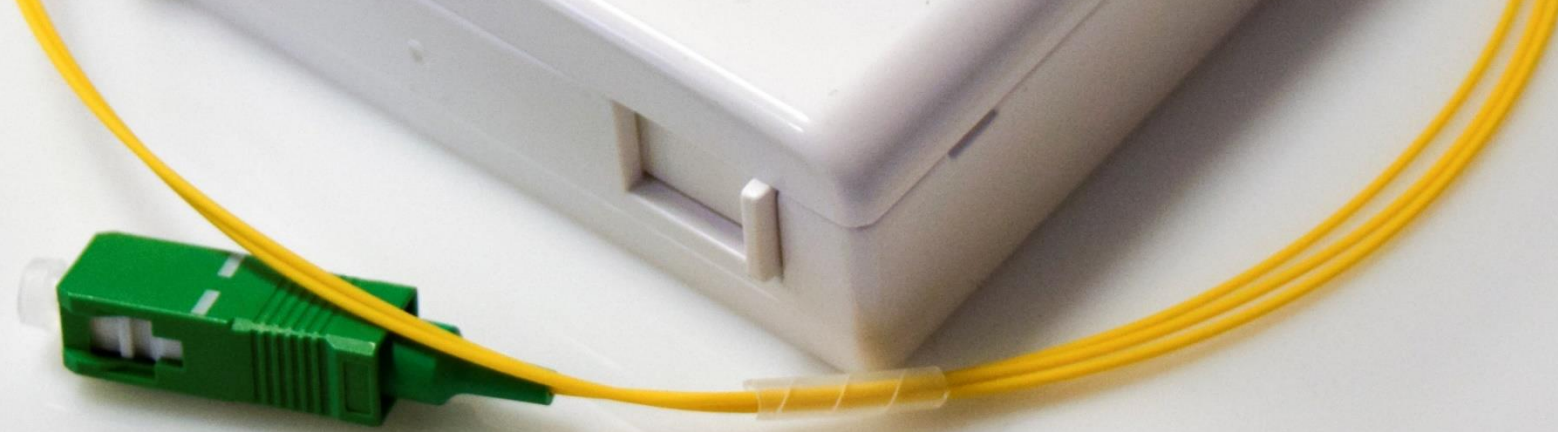
- **Market inspiring**
 - recognizing challenges
 - finding solutions
 - designing prototypes
 - promoting FTTx values
- **Technical support of partners ideas**
 - analyzing
 - highlighting critical points
 - advising
- **OEM service**
 - manufacturing
 - sharing know-how with partners
 - suggesting improvements



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THANK YOU FOR YOUR ATTENTION!

PAWEŁ JANOWSKI

Area Sales Manager

phone: +48 501 594 593

e-mail: pawel.janowski@optomer.pl



OPTOMER