



# ITF TECHNOLOGIES OVERVIEW



100%



Laser Chips & Modules

20%



Contract Manufacturer (CM)  
Partner Specializing in Packaging

100%



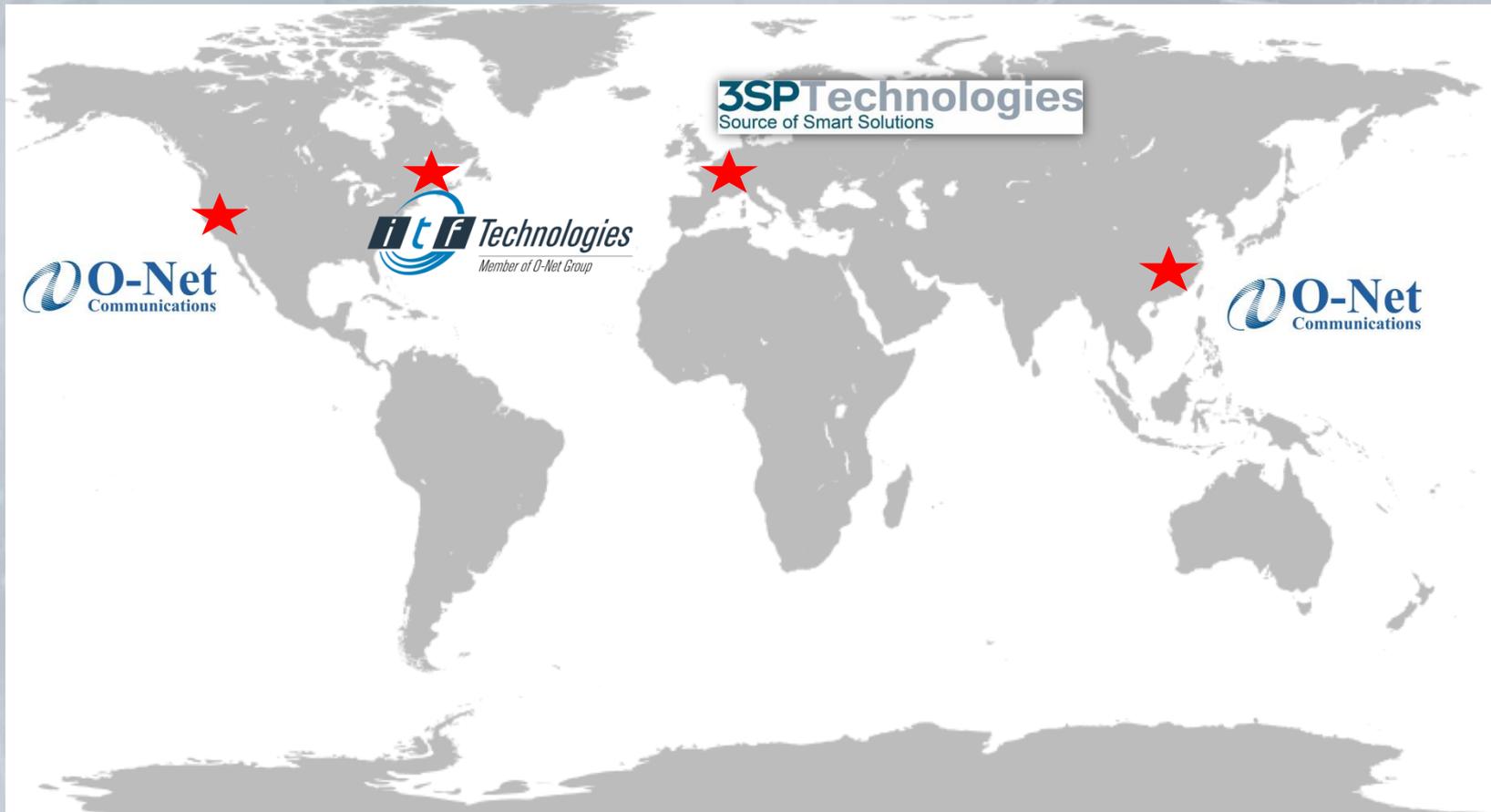
- Established in 2000: Kaifa's Optical Components BU from 1994 to 2000
- Over 2,800 employees worldwide
- Listed in the main board of Hong Kong Stock Exchange in 2010
- Annual sales revenue of US\$120M in 2015, 1H16 results showing +43% growth
- Profitable since 2005
- Acquired 3SP's assets in France and Canada in 2014
- 65% of revenue derived from customers outside China



*Shenzhen, China*



- Shenzhen, China --- Headquarters, Design and manufacturing
- Sunnyvale, USA --- Active products design center
- Montreal, Canada --- Passive products design and manufacturing
- Nozay, France --- III-V Fab, chip design and manufacturing

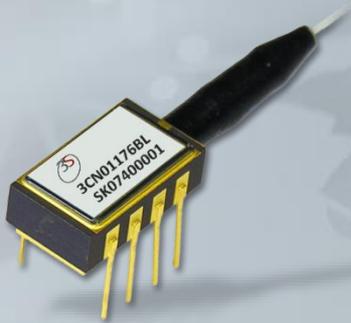


- Acquired by O-Net on October, 2014
- Development and manufacturing of the InP and GaAs based wafers and chips
  - Transmission lasers and detectors for InP, pump lasers for GaAs
- Packaging expertise
  - Pumps modules with or without FBG
  - Transmission lasers, receiver modules with integrated electronics
- 3S Photonics Technology is based in Nozay, France
  - 6,500 m<sup>2</sup> (ex-Alcatel Optronics)
  - 2,500 m<sup>2</sup> of class 1,000 & 10,000 clean rooms for InP & GaAs wafer fab
  - 110 Employees

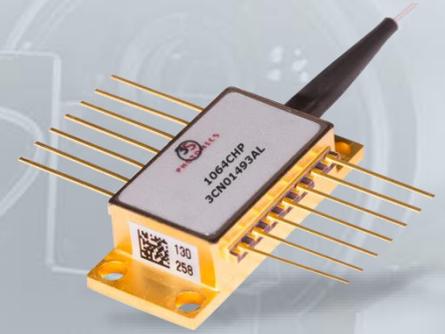




## Active Components



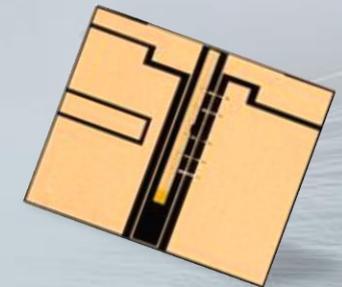
**PUMP LASERS**  
980 nm & 14xx nm



**SEED LASERS**  
1  $\mu$ m



**TRANSMISSION LASERS**  
1.5  $\mu$ m



**CHIPS & CoS**  
Lasers & PD

## Company facts

- R&D and Production in Montreal, Canada.
- Employees
  - 268 total
  - 58 in R&D, including 5 Ph.Ds
  - Over 169 in production

## Facility

- Cleanroom >10,000 sq. ft.
- Cleanroom class: 10,000
- ISO 9001: 2008 certified



- **Production floor**

- >169 operators, 3 shifts, 5 working days + O/T possibilities

- **Production capacity by product family**

- FBGT (pump lockers): >16,000 units/week
- Multimode Combiners: >420 High-Power/week
- FBG mirrors (<30 W): 600 pairs/week
- FBG Mirrors (1kW+): 900 pairs / week\*
- Modules (OLE): 20 / week\*
- Modules (Lidar): 15 / week\*\*

\* Plans for expansion at ITF

\*\*Larger production available at O-Net

# Telecom Components

## FIBER BRAGG GRATINGS (FBGs)

For Telecom Applications



### FBG-based Pump Stabilizer Filters – PSF (Wavelengthers)

- 980nm & 14XXnm
- PM or non-PM fiber
- Custom Design Capabilities

## FIBER BRAGG GRATINGS (FBGs)

For Undersea Applications

### High-Reliability FBG-based Gain Flattening Filter - GFF



### Applications

- Gain normalization across the full EDFA window (1525 to 1615nm)
- Qualified for submarine optical networks
  - Long Haul and Ultra Long Haul DWDM submerged system repeaters

# Industrial Components

## FBG for sensing applications

## FIBER BRAGG GRATINGS

### FBGs for Sensor Applications



#### Applications

- Sensing
  - Acoustic
  - Oil & Gas Monitoring
  - Chemical
  - Temperature
  - Vibration
  - Pressure

# Industrial Components

## High Power Components

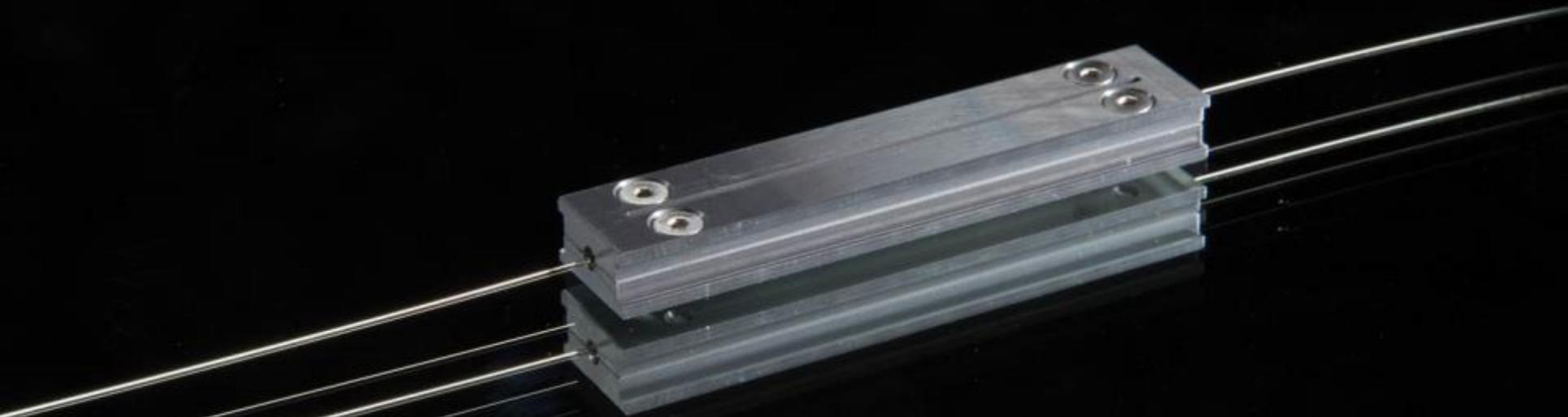
## Low-Power FBG Mirrors



### Applications

- Pulsed Fiber Lasers
- Master Oscillator

## High-Power FBG Mirrors



### Applications

- High Power Fiber Lasers
- Ultra Fast Fiber Lasers

High Power FBG Mirror

## (1+1)x1 package

### Total Pump Power Handling

- Up to 15 Watts



### Applications

- Fiber laser seed amplifiers
- Fiber lasers
- CATV amplifiers
- LiDAR
- Labs & Research

(1+1)x1 Multimode Pump & Signal Combiner

## Value Line Package

(2+1)x1 Configuration

**Total Pump Power Handling**

- Up to 15 Watts



### Applications

- Fiber laser seed amplifiers
- Fiber lasers
- CATV amplifiers
- LiDAR
- Labs & Research

Value Line Multimode Pump & Signal Combiner

## Multimode Mid-Power Package

**(2+1)x1 Configuration**

**Total Pump Power Handling**

- Up to 50 Watts



### **Applications**

- Fiber laser seed amplifiers
- CATV amplifiers
- LiDAR

Mid-Power Multimode Pump & Signal Combiner

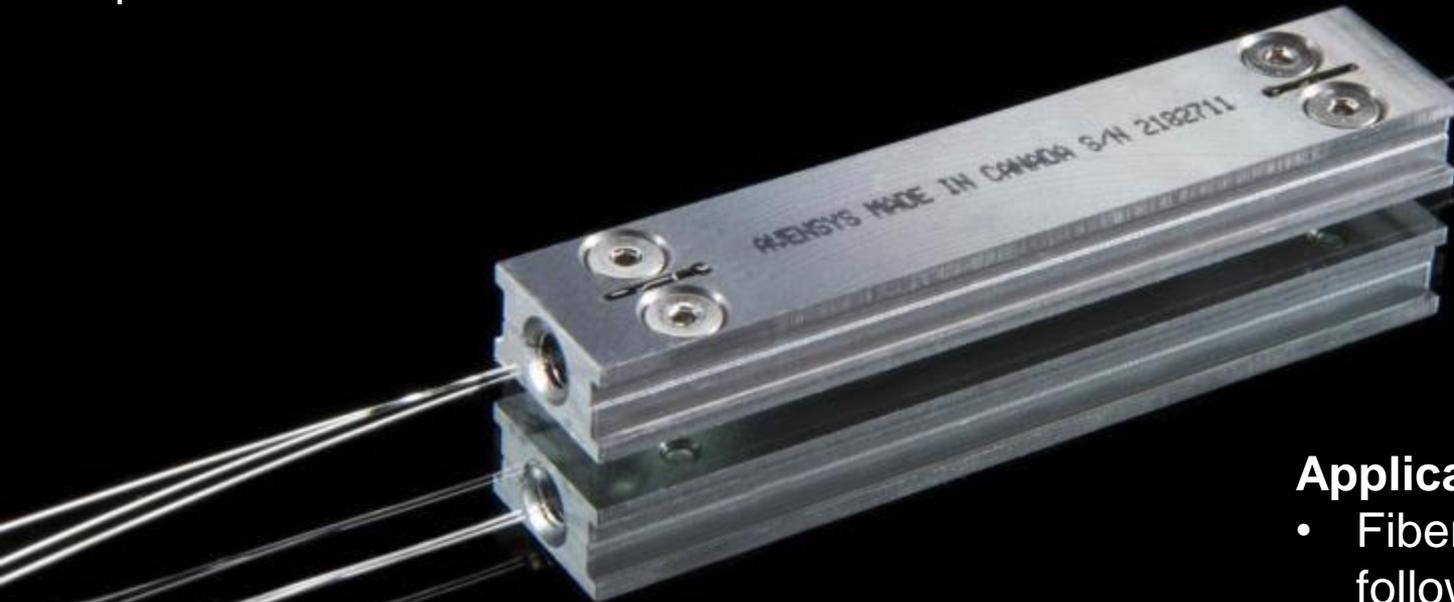
## High Power Package

### Configuration

- Up to (24+1)x1 or (30+1)x1

### Total Pump Power Handling

- Up to 3.5 kW



### Applications

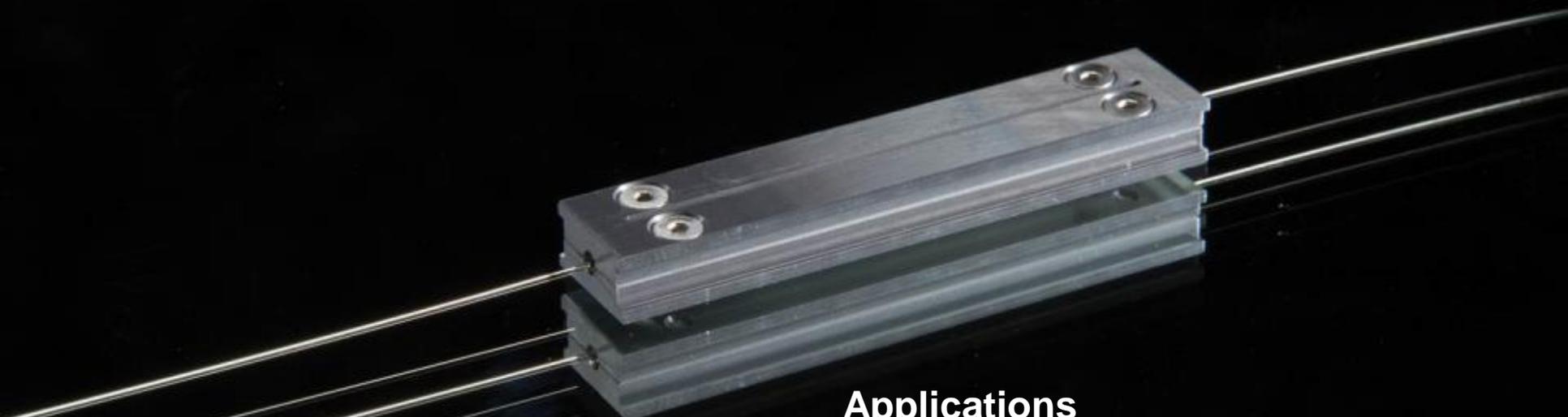
- Fiber lasers for use in the following industries:
  - Industrial
  - Medical

High-Power Multimode Pump & Signal Combiner

- **Mode Field Adapter**

## Key Features

- Smooth modal transition from SM to LMA



## Applications

- High power fiber lasers
- High power pigtailed isolators
- High power fiber Laser manufacturing
- Research and development

## End Cap



### Applications

- Laser Beam Characterization
- Scientific and research applications

End Cap

# Industrial Components

## Sub-Assemblies and Modules

**One name in beam quality**

## To Splice or Not to Splice

(N+1)xHR Integrated Solutions



### Applications

- Fiber Lasers
  - Low Power
  - High Power
  - kW Class
- Industrial
- R&D

Integrated Solution up to 3500 W power handling

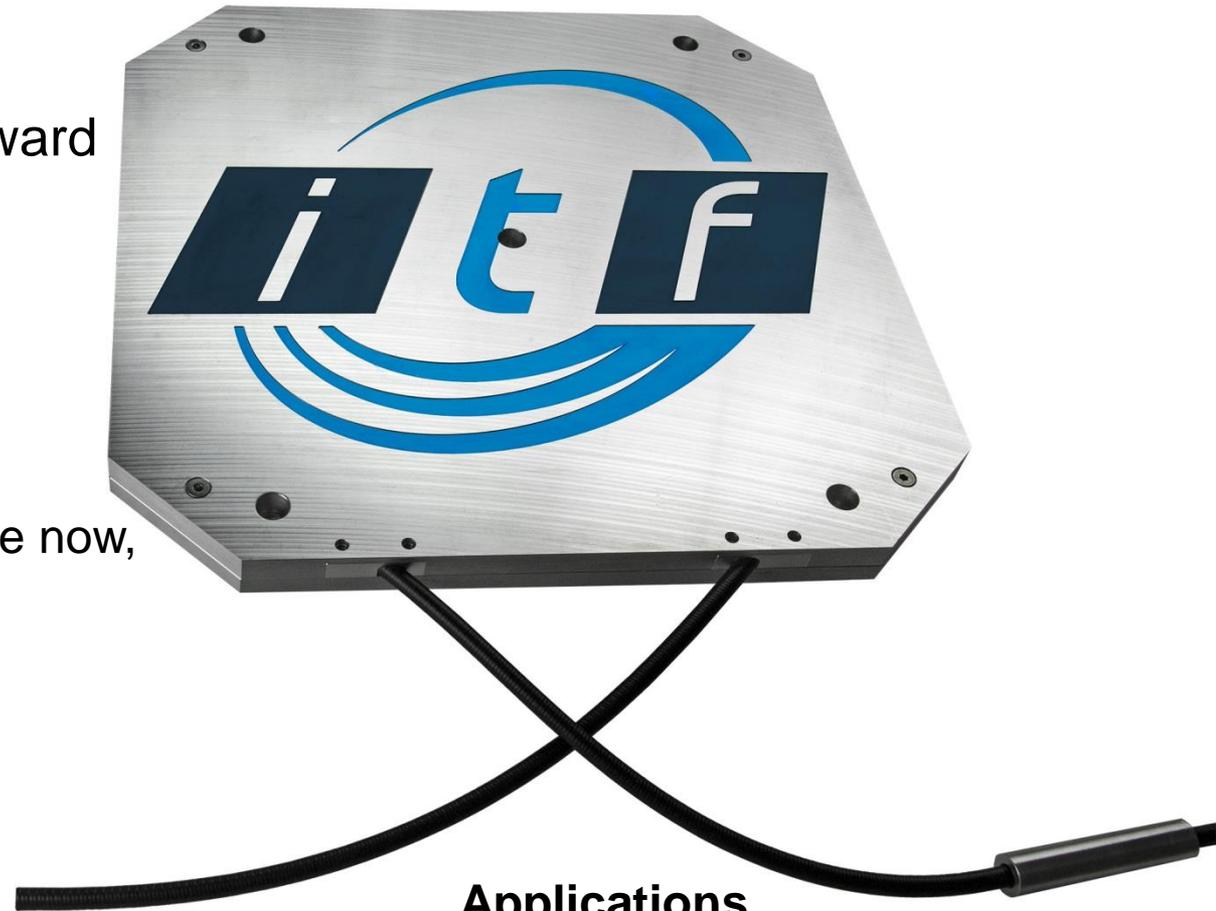
## SUB-ASSEMBLIES

Powering Laser Engines Forward

### Optical Engines

#### Key Features

- 1000 W optical engines available now,
- 2000W available mid 2017
- Integrated:
  - MFA
  - Combiner
  - Gain Fiber
  - FBGs
  - CPS
  - Red Pointer
  - Key parameters monitoring



#### Applications

- Laser systems
- High Power fiber laser systems
- Industrial

Laser Engines up to 1000 W power handling

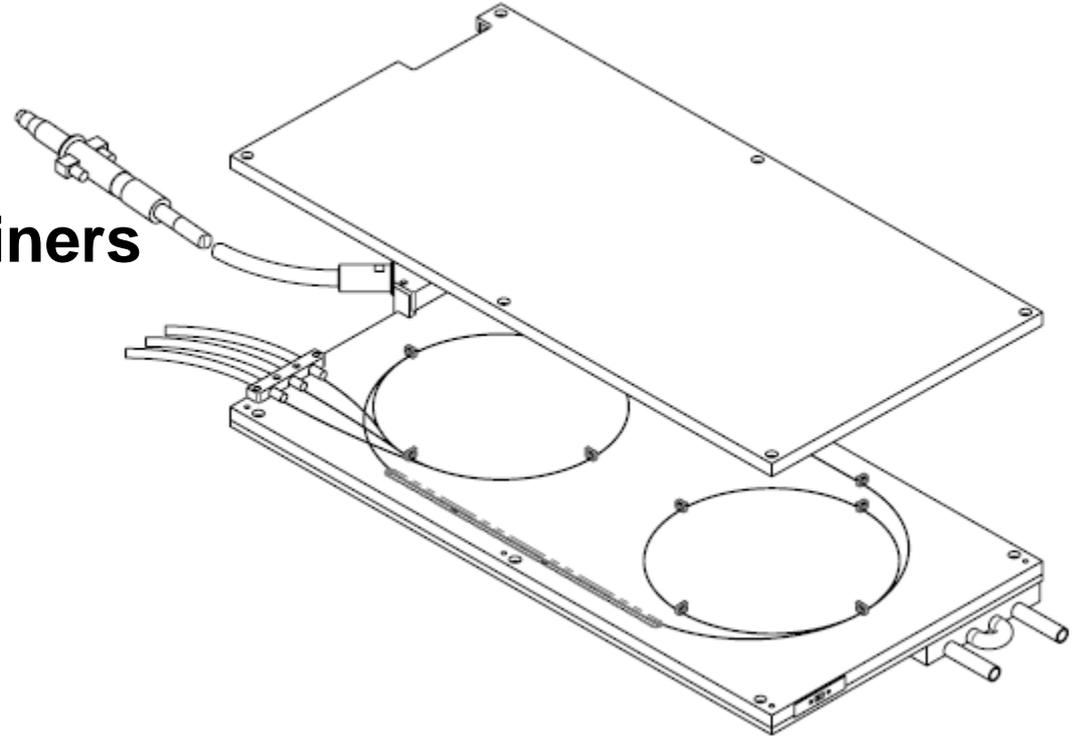
## SUB-ASSEMBLIES

Combining Laser Engines

### High Power Signal Combiners

#### Key Features

- 3 x 1 kW
- 3 x 2 kW (mid 2017)
- 7 x 2 kW (Q4 2017)
- Fiber management
- Integrated:
  - Combiner
  - CPS
  - Key parameters monitoring



#### Applications

- High Power fiber laser systems
- Industrial

## SUB-ASSEMBLIES

Powering Laser Engines Forward

### Optical Source for Lidar

#### Key Features

- Compact Design
- High Peak Power
- High OSNR
- Excellent beam quality
- Ultra Low Jitter
- Eye Safe (1550nm)
- High Reliability for Harsh Environments
- Optional Optical Output Monitor



#### Applications

- Self-Driving Vehicules
- 3D Mapping
- Distance Measurement

Pulsed Laser source for Lidar

THANK YOU