

## NEW VERSATILE AND COMPACT OPTICAL CONNECTORS DEDICATED TO EXTREME ENVIRONMENTS

*Jean-François Vinchant, Laurent Lièvre and Jean-Michel Malavieille*

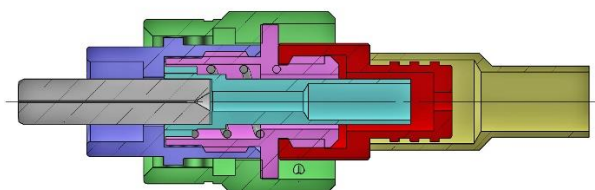
**The demand for high performance optical connectors suitable for extreme environments is on the rise. However, the existing solutions only partially cover the demanding requirements of defense, aerospace, oil & gas, and nuclear applications, when they do not become obsolete.**

Lots of people are talking about harsh environments but, when figures are more deeply described, these environments are far less severe than the ones SEDI-ATI is targeting. For this reason, SEDI-ATI is now talking about **extreme environments** rather than harsh environments. Indeed, extreme environments are considering the following values:

- High temperatures ranging from, 125°C up to 600°C and even 1000°C
- Low temperatures down to -273°C
- High pressures up to 1500 bars for geophysics and even 5000 bars for detonics
- Hermeticity down to 10<sup>-9</sup>/10<sup>-10</sup>
- High voltage dielectric breakdown up to 1KV per cm
- Very high level of cumulative nuclear radiations in front of a nuclear reactor
- UV solarization resistance down to 200nm
- and so on

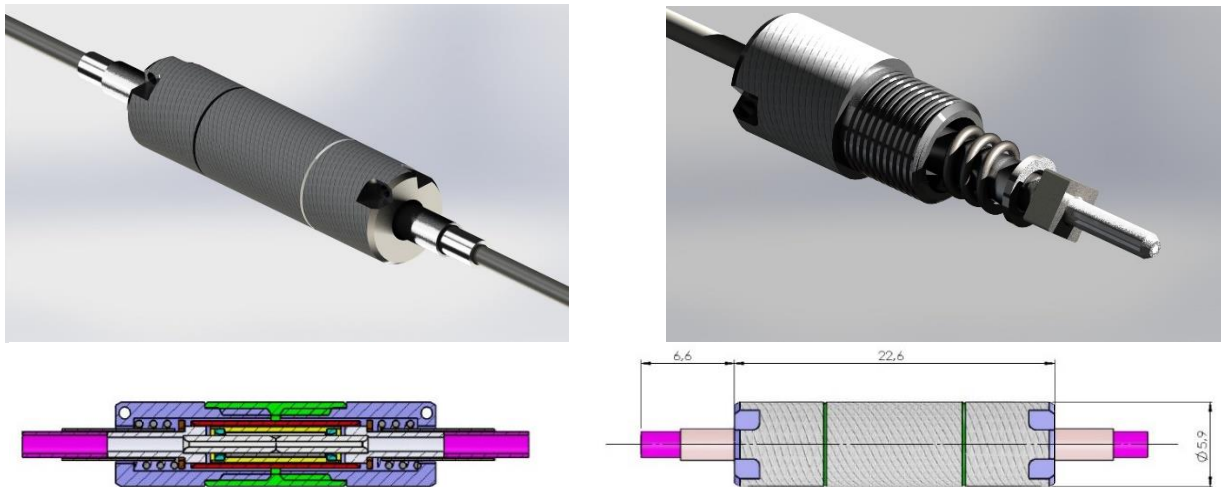
SEDI-ATI recently released two new **versatile and compact connectors** for optical fiber links dedicated to extreme environments. These optical connectors, easy to mount by design, can be used with all types of single mode or multimode fibers and can accept all the types of protection of fibers, including metal, tube or peek. These connectors are suitable for high temperature (up to 600°C), corrosive or radiative (stainless steel or ceramic parts) or vacuum (no outgassing part) environments. The specific design of these connectors is compatible with all the different types of optical fiber assemblies: gluing, brazing, ceramabound or glass soldering technologies. The last but not the least, these connectors can be secured by a wrapping wire and the design has been done to support shocks and vibrations. In addition, these connectors can be color-coded.

The first newly designed connector is a FC type connector, fully compatible with the FC JIS standard. This connector, named FCxtreme®, is rather short (< 31mm) and has an outer diameter smaller than 10mm.



**FCxtreme® optical connector and its versatile design**

The second connector, named NANOxtreme<sup>®</sup>, is very short (< 6mm) and allows very compact optical fiber links (< 36mm) and has already been tested in oil & gas environments.



**NANOxtreme<sup>®</sup> optical connector and its very compact design**

The in-depth qualifications of these two connectors are ongoing. The main targeted but non-exhaustive applications are -55°C/125°C for aeronautics, -40°C/200°C for geophysics and more than 600°C for extreme environments. A test in a severe nuclear environment is planned. Furthermore, tests in salt spray conditions and under vibrations (5Hz to 55Hz), chocs (1-meter x 10) and seismic are also considered.

---

#### Press Contact

Jean-François Vinchant

+33 (0)1 69 36 64 10

vinchant.jf@sedi-ati.com

#### About SEDI-ATI Fibres Optiques

SEDI-ATI is specialized in custom optical fiber components and solutions for extreme environments such as extremely high and low temperatures, extreme pressures from ultra-high-vacuum to hyperbare, and radiative, corrosive or abrasive environments. SEDI-ATI addresses complex applications for the military & aerospace market, as well as for the energy, the laser industry, the communication & security, the research, and the medical markets. SEDI-ATI offers connectors, pigtails & cables, couplers & WDMs, hermetic feedthroughs, bundles & arrays, and medical probes. Learn more on [www.sedi-ati.com](http://www.sedi-ati.com).