DIAMOND COMPANY PORTRAIT

DIAMOND is a leading global supplier of high-precision fiber-optic solutions and has been successfully supplying a wide range of markets for over 30 years now. Diamond is also recognised as a dynamic and innovative company that knows how to manufacture reliable and customised components and devices in order to satisfy the ever-increasing demands of clients. In addition to the company headquarters, which was founded in Switzerland in 1958, Diamond can count on a global distribution network with 4 subsidiaries and over 20 representatives.

HARSH ENVIRONMENTS

The worldwide market for harsh-environment fiber optics is experiencing steady growth due to the rapid advances made in fiber-optic technology, as well as the increasing demand for fiber-optic components for challenging applications. As a result, DIAMOND has responded by developing a wide range of strong, reliable, and customisable indoor/outdoor field optical connectors with superior optical performances for both standard and special products that integrate technologies for High Power and Polarization Maintaining PM Solutions. These products must be able to withstand adverse temperatures and weather conditions, shocks, vibrations, tensile stress, external pressure, corrosive surroundings, etc., which are much harsher than the environmental conditions typically endured by standard commercial connectors and cable assemblies. Typical applications are: energy plants, coal mines, offshore oil platforms, cement factories, refineries etc., as well as field-deployable communications, mobile diagnostic units, avionics and space travel, security systems, machine controls, industrial machine networks.

OUR STRENGTHS AT A GLANCE

- Polarization maintaining PM
- High Power technology PS
- Field Repairable
- IP65-IP68
- Customizable
- SM/MM-APC/PC
- Unparalleled high Return Loss RL
VERSATILE AND MODULAR FIBRE OPTIC SOLUTIONS
NEW DM4 MULTIPURPOSE INSERT BASED ON CROCODILE ALBERINO

Diamond has developed the new factory-terminated and measured fiber-optic Crocodile Alberino HE (Harsh Environment) to allow customers to assemble precision-engineered termini ensuring low data loss and reliable, repeatable performances over long distances in many applications. This assembly can be performed with the Zeus D50 HE fusion splicer from Diamond.

In addition to the optical termini, Diamond also developed the electrical termini with the same dimensions, and both parts form the base of the new DM4 that is the core of our HE-2000®, MIL-38999 DM4 Family and MIL-83526 DM4 connectors. Furthermore, the design of the DM4 OEM insert is constructed to fit into a variety of different connector housings. Compatibility with tight cable and semi-loose cable/fiber construction is ensured.

Characteristics of DM4 insert
- Based on standard 2.5-mm Alberinos with integrated springs to prevent termini separation
- Up to 4 channels
- Hybrid, FO - Electrical
- Genderless mating and self-aligning design
- Easy front-face ferrule access for cleaning & inspection
- Easy termini insertion and removal for field termination and repair

Features of termini
- Compatible with several fiber types such as MM, SM, PM and small-core fibers
- Available in PC and APC versions
- Steady and repeatable low IL and high return loss (when APC is polished)
- High and steady ER when terminated with PM fibers
- Compatible with tight cable construction and semi-loose cable/fiber construction
- Field repair and termination available with the Diamond Fusion Crocodile Alberino
- Titanium ferrule front face
- Electrical pins 20 AWG
- HE-2000® connector
- MIL-38999 DM4 size 13 connector
- MIL-83526 DM4 connector
OUTDOOR, INDUSTRIAL

HE-2000® Connector
- Automatic protection shutter on connector IP 65
- Bulkhead IP 67 (manual shutter) or IP 54 (automatic shutter)
- Push-pull mechanism for easy handling
- Hard-environment plastic shell, made from nylon with 25% fiber-glass reinforcement
- Bulkhead frame in Zinc (ZnAl4Cu1) and black chromed
- IP class: IP67 in connection
- Easy front-face ferrule access for cleaning & inspection
- Mechanical and colour-coding upon request
- Electrical pins 20 AWG
- Available on cable reels up to 500 metres in length
- Protection cap for HE-2000® connector IP 67

X-BEAM Connector
- Integrated expanded beam lens system to protect the fiber end-face
- Rugged construction for high reliability
- IP68 rated enclosure, IEC 60529 compliant
- Hermetic coupling (EN 1779 / DIN EN 13185)
- Low loss connection and high repeatability
- Genderless design to simplify mating
- Field repair and termination available
- Available on cable reel up to 500 meters length
- Loopback bulkheads available

revoS E-2000® Connector
- Rugged IP 65 rated metal enclosure (Dust tight and spray proof)
- Integrated caps and shutters
- Laser eye safety
- E-2000® connector with Active Core Alignment
- Exceptional optical performance
- Easy lever locking
- Available on cable reel up to 500 meters length

DiaFlex (Fan-Out Connector)
- DIAMOND multi-fiber connector for 8, 12, 24 fibers
- Replaceable fiber whips
- Protective cap with feed-in eye
- IP class: IP68
- Cable retention 700 N
- Simple to use on site
- Robust metal fiber divider
- Can be used flexibly thanks to the small external diameter
- Client-specific connector types and cable lengths

OPTELCON Mediaconverter
- Variable mounting in cabinet walls as thick as 4 mm
- Compact, robust design
- M50 cutout sealed to IP65
- Robust revoS E-2000® bulkhead with dust cap and IP65 protection
- Direct optical-electrical connection through the bulkhead
- Plug and play
- CE approved
- RoHS compliant

MIL-38999 DM4 Family
- Size 13 and 25 shells (according to MIL std 38999 serie III)
- Low Insertion Loss and high reliability Typ. IL 0.2dB
- Easy field termination and repair of size 13
- Available on cable reel up to 500 meters length
- 4 to 12 channels

MIL-83526 DM4 Connector
- Rugged construction for highly reliable optical connections
- IP class: IP68 rated
- Easy ferrule front-face access for cleaning & inspection
- Keyed, self aligning connector housing aides in “blind” mating applications
- Electrical pin size 20 AWG
- Easy termini insertion and removal for field termination and repair

revos E-2000® Connector
- Rugged IP 65 rated metal enclosure (Dust tight and spray proof)
- Integrated caps and shutters
- Laser eye safety
- E-2000® connector with Active Core Alignment
- Exceptional optical performance
- Easy lever locking
- Available on cable reel up to 500 meters length

Diavon® (Fan-Out Connector)
- DIAMOND multi-fiber connector for 8, 12, 24 fibers
- Replaceable fiber whips
- Protective cap with feed-in eye
- IP class: IP68
- Cable retention 700 N
- Simple to use on site
- Robust metal fiber divider
- Can be used flexibly thanks to the small external diameter
- Client-specific connector types and cable lengths

OD3 Connector
- Rugged 67 rated anodised metal enclosure
- Dust-tight and waterproof
- F-3000® (LC compatible) SFF connector system
- Exceptional optical performance in a high-density LC standard compliant connector. Integrated caps on the connectors and shutters in the couplers provide both laser eye safety and end face protection during mating/demating
- Exceptional optical performance
- Available on cable reel up to 500 meters length
AVIONICS AND SPACE INTERCONNECTIONS

Diamond has been supplying the renowned AVIM® connector for ruggedized applications for over 20 years. Upon completion of qualification under ECSS specifications for the European Space Agency, the AVIM® and Mini AVIM® products will be the first fiber optic connectors qualified for space applications.

AVIM® Connector
AVIM® are multipurpose, Commercial Off-The-Shelf fiber optic connectors offering high optical performance and capable in dynamic environments of mobile platforms, including avionics and especially space flight. These connectors are compatible with the widest range of optical fibers, including singlemode (SM), multimode (MM), polarization maintaining (PM) and other fibers of different core/cladding sizes.

- Low IL thanks to Active Core Alignment (A.C.A.)
- High return loss thanks to Diamond polishing technique
- High performing polarization extinction ratio (PER), when terminated with PM fibers
- Miniaturized MIL-style ratchet system with high vibration/shock resistance
- Unique AVIM® 2-piece cleanable adapter for easy cleaning and maintenance access
- Right angle boot available for facilitating unique installation and routing requirements

Mini AVIM® Connector
The Mini AVIM® connector has been developed upon market request for a smaller and lighter version of our acclaimed AVIM® connector, especially for space applications. The Mini AVIM® combines two leading edge technologies: the AVIM® MIL-style ratchet system and the base construction of the Diamond Micro Interface (DMI) connector. Applications will range from Space to underwater, applying to mobile, avionics, shipboard, oil downhole, etc.

- Compact, small and lightweight
- Low loss thanks to Diamond Active Core Alignment (A.C.A.)
- High return loss thanks to Diamond polishing technique
- High performing polarization extinction ratio (PER), when terminated with PM fibers
- Miniaturized MIL-style ratchet system with high vibration/shock resistance
- All Titanium – ZrO2 material for ultra low CTE mismatch

* AVIM® is a registered trademark of DIAMOND SA in the European Union, USA and other countries.
**FIELD INSTALLATION AND SERVICES**

**Zeus D50 HE Fusion splicers**
Complete set of all tools required for the full termination process starting from cable preparation to connector assembly (including cleaver and automatic stripper with heated jaws for tough secondary coating 900 μm)

- Based on Diamond’s Crocodile Alberino Fusion
- Suitable for use with 3-8mm military and outdoor cables
- Special cable clamps on bearing slides for secure and easy cable handling
- Removable work plate – compatible with stand

**Launch fibers**
Diamond offers two types of launch fiber boxes for outdoor connectors: one for the revos E-2000® and the other for the HE-2000®.

**Cleaning and Inspection**

**Cleaning Kit with hand microscope**

After repeated matings or when degraded performance is observed, it may become necessary to clean the individual ferrules and mating sleeve.

DIAMOND’s Cleaning Kit contains all necessary tools for proper cleaning and inspection procedures to help ensure optimal connector performance.

- Easy-to-use, lightweight, robust and field-proven

**Video Microscope Kit with cleaning tools**
Contains all necessary tools for proper inspection and cleaning of the connector’s front-faces to help ensure optimal connector performance.

- Integrated optical power measurement for wavelengths from 780 to 1625 nm
- Generates certification reports
- Pass/Fail acceptance criteria with dedicated profiles for each requirement
- Automatic fiber-image centering

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**Vacuum feedthrough**

Diamond proposes vacuum feedthrough V-FT solutions for a large range of optical fiber and adapters, using an epoxy sealing technology. V-FT integrates a standard 2.5mm ferrule permanently sealed in a standard CF flange with a variety of adapters. The obtained feedthrough benefits from a very low leak rate. It can be ordered for many type of fibers, including SM, MM, FM, PS, large core MM and others. Multi-channel systems are also available using standard CF building block elements.

- Compact, robust, stable
- Low loss due to Diamond Active Core Alignment
- High return loss due to Diamond polishing technique
- Low leakage due to Diamond sealing technology

**High Temperature Connectors**

Diamond HT assemblies rely upon a combination of specialized assembly techniques and materials, together with special fibers with appropriate coatings suitable for deployment in harsh environments. Further to the traditional advantages, these assemblies offer immunity to electromagnetic interference, better environmental stability and enhanced remote sensing compared to traditional electronic sensors. Assemblies are available in PC and AP version with MM or SM fibers.

- Reliable operation up to 150°C (302°F)
- Low Insertion loss thanks to ACA
- Ultra high polish for High return loss

**Crocodile Repair Set**

Diamond’s Crocodile repair set provides a simple way to repair or add cable extensions to existing cable installations. Its lightweight and robust construction permits to use it in harsh environments and under high mechanical stress. It is available for SM and MM service, for secondary coated fiber and fiber cables (1.6mm – 3.1 mm). The Crocodile repair set is to be field terminated via a low loss fusion splice based on DIAMOND’s ZEUS Fusion Field Termination Kit.

- Simple, fast and reliable field repair, even in severe conditions
- Integrated, small and robust splice protection and cable boots
- Compact, light weight
- Resistant to high cable tensions
### Environmental conditions

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<thead>
<tr>
<th>Measurement / Test</th>
<th>Parameters</th>
<th>Method</th>
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<tbody>
<tr>
<td>Change of temperature (Reliability)</td>
<td>-40°C / +45°C / 1 h dwell / 500 cycles</td>
<td>IEC 61300-2-22</td>
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<tr>
<td>Low temperature</td>
<td>+85°C / 2 000 h</td>
<td>MIL-STD-810F</td>
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<tr>
<td>Dry heat (Reliability)</td>
<td>-51°C / +71°C / 1 h dwell / 3 cycles</td>
<td>MIL-STD-810F</td>
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<td>Termal shock</td>
<td>+572 m / 1 h</td>
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<td>Low pressure, procedure II</td>
<td>2'608 m to 12'192 m / 60 s</td>
<td>MIL-STD-810F</td>
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<tr>
<td>Damp heat, cyclic (Reliability)</td>
<td>+25°C / +85°C / 95% r.h. / 1 500 cycles</td>
<td>IEC 61300-2-46</td>
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<tr>
<td>Composite*</td>
<td>-10°C / +25°C / +45°C / 99% r.h. / 15 cycles</td>
<td>Telcordia GR-326-CORE</td>
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<tr>
<td>Extended humidity (Reliability)</td>
<td>+85°C / 85% r.h / 2 000 h</td>
<td>IEC 61300-2-21</td>
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<tr>
<td>Salt mist</td>
<td>+35°C / 52 g / 16 h</td>
<td>IEC 61300-2-26</td>
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* E-2000® only

### Mechanical conditions

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<th>Measurement / Test</th>
<th>Parameters</th>
<th>Method</th>
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<td>Proof at 0°</td>
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<tr>
<td>Proof at 90°</td>
<td>2.3 Kg - 3.4 Kg / 5 s</td>
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<td>Twist</td>
<td>1.35 Kg / 918° / 10 cycles</td>
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