WEBINAR

Fiber optics applications within harsh environments
Challenges and solutions
Presentation Outline

Typical applications and their challenges

DM4 insert and its properties

Existing connector solutions and customized OEM approach

Expanded Beam technology – a robust and versatile alternative

Q&A
Typical applications within harsh environments

- Avionics
- Antenna
- Space
- Solar Plants
- Industries
- Transportation
- Wind Farm
- Oil & Gas
- Container Terminal
- Mining
- Military / Defense
- Oil & Gas
Challenges / requested properties for HE applications

The products must be able to withstand:
- Adverse temperatures and weather conditions
- Shocks, vibrations, tensile stress
- External pressure, corrosive surroundings, etc.
- Dirt and humidity
DM4 – compact & modular solution

HE-2000™, MIL-38999 DM4 Family, MIL-83526DM4
DM4 (Multipurpose Termini) main features

- Based on 2.5-mm Fusion Alberinos with integrated springs to prevent termini separation
- Up to 4 optical and/or electrical channels
- Genderless mating and self-aligning design
- Easy front-face ferrule access for cleaning & inspection
- Simple assembly and disassembly of contacts for on-site integration and repair
Features of optical & electrical termini

- Compatible with several fiber types such as MM, SM, PM, Power Solution and small-core fibers
- Available in PC and APC versions
- Steady and repeatable low Insertion Loss (IL) and high Return Loss (RL)
- High and steady Extinction-Ratio (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 and Diamond ZEUS D50 HE fusion splicer
- Titanium ferrule front face
- Electrical pin: 20 AWG
# Optical and electrical specifications

## Optical Performances

<table>
<thead>
<tr>
<th>MEASUREMENT/TEST</th>
<th>MULTIMODE</th>
<th>SINGLE MODE PC/APC</th>
<th>STANDARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion loss (std. version)</td>
<td>typ. 0.20 dB</td>
<td>typ. 0.15 dB</td>
<td>IEC 61300-3-4 (λ =1310 / 1550 nm)</td>
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<tr>
<td>Insertion loss (PM) version</td>
<td>typ. 0.50 dB</td>
<td>typ. 0.25 dB</td>
<td>IEC 61300-3-4 (λ =1310 / 1550 nm)</td>
</tr>
<tr>
<td>Return loss</td>
<td>min. 40 dB</td>
<td>min. 75 dB (APC)</td>
<td>IEC 61300-3-6 (λ = 1550 nm)</td>
</tr>
<tr>
<td>Extintion Ratio</td>
<td>-</td>
<td>typ. 23 dB min. 20 dB</td>
<td>Diamond validated cross polarizers method (λ = 1550 nm)</td>
</tr>
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</table>

## Electrical Tests

<p>| | | | |</p>
<table>
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<tr>
<td>Insulation resistant test</td>
<td>Resistance &gt;200 MΩ</td>
<td>IEC 60512-3-1: 2002 (500V / 60 s)</td>
<td></td>
</tr>
<tr>
<td>Voltage Proof test</td>
<td>PASS</td>
<td>IEC 60512-4-1: 2003 (2500V / 60 s / 50 Hz)</td>
<td></td>
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</tbody>
</table>
DM4 (Multipurpose Termini) modularity

- MIL-38999 DM4 Family
- Custom Housing
- MIL-83526 DM4
- HE-2000™
Expanded Beam Interconnects

Robust. Versatile. Easy-To-Use.
Expanded Beam Technology

- Non-contact connection
- State-of-the-art optical performance
- High rate of mating cycles
- Insensitive to dirt and debris
- Low risk of damage
- High data rate capacity
- Easy cleaning process
- 150 x larger beam area
Diamond HE connector families

**DM4**

- High Optical performances (IL,RL)
- Low harsh environment reliability
- Cleaning tools
- Repairable / manufacturable in-field
- Fully customizable
- Hybrid version

**X-BEAM**

- Low optical performances (IL,RL)
- High harsh environment reliability
- No cleaning tools
- Repairable in-field MM
- No customizable
- No Hybrid version

**DM4 PC**

- High Optical performances (IL,RL)
- Low harsh environment reliability
- Cleaning tools
- Repairable / manufacturable in-field
- Fully customizable
- Hybrid version

**DM4 LENSED**

- Medium Optical performances (IL,RL)
- Medium harsh environment reliability
- No cleaning tools
- Repairable / manufacturable in-field
- Fully customizable
- Hybrid version

**X-BEAM LENSED**

- Low optical performances (IL,RL)
- High harsh environment reliability
- No cleaning tools
- Repairable in-field MM
- No customizable
- No Hybrid version
Diamond connectors positioning

OPTICAL PERFORMANCES

HARSH ENVIRONMENT CONDITIONS
DM4 solutions (PC or Lensed) vs. X-Beam solutions

- Military new projects / custom tailored projects
- High flexibility
- High optical performances (Insertion Loss, Reflection Loss)
- High Power option (PS)
- Polarization Maintaining option (PM)
- Hybrid Option
- In-field complete repairing and manufacturing kits

- Military standard connector;
- Military old/existing projects
- Lower optical performances (IL, RL) than DM4
- Higher dust immunity
- In-field repairing kit only for MM fiber
- Higher price
## Diamond X-BEAM vs. other X-BEAM

<table>
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<tr>
<th>DIAMOND X-BEAM</th>
<th>COMPETITOR X-BEAM</th>
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<td>Superior optical performances (ACA)</td>
<td>Multi channels / multi format versions</td>
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<td>MM version in-field repairable</td>
<td>(Mini, Junior, Senior)</td>
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- Superior optical performances (ACA)
- MM version in-field repairable
- Low failure rate by sophisticated quality assurance
- Cable pull force guaranteed

- Multi channels / multi format versions
  - (Mini, Junior, Senior)
Thank you for joining us today!

Contact us!

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