Adamant Namiki Precision Jewel Co., Ltd.
Products

**Industrial Jewel Parts**

**DC Coreless Motors**

**Fiber Optic Components**

**Medical Devices**
Our Value

Core Technology

Fiber Assembly

Material Processing

Advanced Photonic Interconnects

Applications

Si Photonics / Photonic IC

Optical Switch

SDM

Let us design with you the optical I/O for next-generation applications.

High-speed transceivers? On-board optics? Photonics Packaging?
Technology

Fiber Assembly

1D Array

2D Array

Advanced Fiber Processing

Bending / Thermal Processing

Etching / Polishing

Advanced Interconnects

50μm Pitch

Typical 250μm pitch Array

Narrow-Pitch Array

Curved 8-Fiber Array

MT Ferrule

Curved Fiber Array + MT

2D MEMS Switch

MCF Array, Fan-In/Out

Company Confidential
Inter Connecting Device

Grating Coupler

Edge Coupler

Bending Fiber / Laser Micromachining

MFD Conversion Fiber (TEC Fusion)
Fiber Assemblies for Coherent Devices

2 Channel Fiber Coupler

- Glass Capillary Assembly
- Dual Hole Ferrule Assembly
- Fiber Block with Lensed Fiber

Multi-Channel Fiber Coupler (SUS Ferrule)

- Pigtail fiber for Custom module

For a fiber and chip combination, a multi-channel fiber assembly is possible. Glass capillaries for direct coupling with a chip, a ceramic capillary with a SUS ferrule base for spatial beam combinations are applicable as well. In the case of 2 channels, a combination of SMF + PMF, PMF + PMF as well as SMF + SMF are considered. Further multi-channel combinations using specialty fiber are assumed requiring fiber array coupling using 4 core SUS ferrule and PMF multi-core fiber, which has been developed.
Fiber Etching → Narrow-Pitch Array

Thermal Processing → Curved Fibers

Grind / Polish → Lensed Fibers

Laser Cleave → Angled Fiber Tips

Etched section

Φ30 ± 0.5 μm

50 ± 1 μm

Curved 8-Fiber Array

MT Ferrule

Beam
Adamant’s laser processing technology realizes high efficiency coupling between optical fiber and optical parts (Si / Quartz waveguide, LD, PD, etc.) by its high accuracy micromachining. Our highly skilled engineering customized coupling devices design to our clients’ needs.

### Field of Target
- Photonic IC Interconnects
- Pigtail Fiber for Small Form Transceivers
- Fiber Processing by Laser
- Laser Cleave of Fiber with Glass Capillary

### Technologies/Products
- FAU by Laser processing
- Laser Cleave of Fiber with Glass Capillary

### Table: Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
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</thead>
<tbody>
<tr>
<td>Channels</td>
<td>Single, Arrayed (≤12ch)</td>
</tr>
<tr>
<td>Diameter of Fiber</td>
<td>80um, 125um (standard) or Others</td>
</tr>
<tr>
<td>Type of Fiber</td>
<td>SMF, MMF, PMF</td>
</tr>
<tr>
<td>Variation of Fiber protruding</td>
<td>≤1um (fiber core to core as same fiber array)</td>
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<tr>
<td>Angle of Fiber Endface</td>
<td>0 to 45 deg. or Custom</td>
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<tr>
<td>Variation of Angle</td>
<td>±0.5 deg (σ), ±0.3 deg (typical)</td>
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<tr>
<td>ROC of Fiber Endface</td>
<td>R 0.4mm (typical)</td>
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<tr>
<td>Reflection</td>
<td>≤60dB (deg.)</td>
</tr>
<tr>
<td>Ra</td>
<td>0.03um</td>
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</tbody>
</table>

Fiber Cleaving with Glass Tube (Φ0.4Max)
Adamant embodies the fiber coupler according to market requirements with original technology.

**Field of Target**

- Photonic IC Interconnects
- Pigtail Fiber for Small Form Transceivers

**Technologies/Products**

- Lensed Fiber Assembly
- Fiber Array for Reflow Process
- Narrow Pitch Fiber Array

**Specific Fiber Array**

- Spherical Lensed Fiber
  - For all Laser Modules Higher Coupling (CE) with 1/1 Circular LD Pattern

- Cylindrical Lensed Fiber
  - For 980nm Pump Laser Modules Higher Coupling (CE) with 1/3 Elliptical LD Pattern

- Bi-Conical Lensed Fiber
  - For Raman Laser Modules Coupling (CE) with 1/2 LD Pattern

- Multi Surfacd Spherical Lensed Fiber
  - For Mirror Devices and Others

- Multi Channel Lensed Fiber Array

- Reflow (over 250°C) FA

- 80um pitch
High-Density Interconnects

High-Density Fiber Arrays

- 50μm Pitch
- Typical 250μm pitch Array
- Narrow-Pitch Array
- 2D Array for MEMS Optical Switch

SDM Solutions

- Multi-Core Fiber Array
- Customized Zr Ferrule
- Etched-Fiber Bundle for MCF Fan-In/Out
Adamant is developing 2D fiber coupler for multi channel transmission. In the future, we plan to apply special fiber (Multi Core Fiber, PMF).
Adamant is developing its next generation ferrule with own injection molding technology.

**Field of Target**
- Ceramic Ferrule for Advanced Connecting

**Technologies/Products**
- Special Inner Diameter Ferrule
- Non Circular Hole Ferrule
- 4ch LC Ferrule for MMF, SMF
- 4ch LC Patch Cord for SMF

- Developing SMF ferrule of minimum 40 μm

**Special Inner Diameter Ferrule**
- 60μm
- 80μm
- 500μm

**Non Circular Hole Ferrule**
- for MCF, PMF

**Multi Channel Ferrule and Assembly**
- D-hole
- Square
- Hexagon