Glenair offers four connector series engineered in accordance with nuclear industry standards for containment area class 1E. Series SuperNG and Mighty Mouse NG are suitable for use in new plants with the most stringent zone 1E qualification standards. Series ITS-NG and IPT SE-NG are suitable for use in older plants undergoing retrofit or refurbishment.

- The entire family of Glenair NG interconnect solutions is manufactured in an NQA-1 (10CFR50 Appendix B) qualified manufacturing quality and traceability system
- Full audit report and auditor statement of compliance available
- ASME NQA-1 : Quality Assurance Program Requirements for Nuclear Facility Applications in place. Quality controls include “down-to-the-molecular-level” analysis for all raw materials ensuring Glenair’s total control over all aspects of fabrication employed in our NG series connectors.
NUCLEAR-GRADE QUICK-DISCONNECT CONNECTORS

Designed For New Construction and Existing Plant Containment Area (Class 1E) Applications

NG Connector Selection Guide

SuperNG
Double Peripheral Seal Quick-Connect Series for Stringent Class 1E Containment Area Applications

Mighty Mouse NG
Ultraminiature High-Pressure Quick-Connect for New Plant Class 1E Containment Area Applications

ITS-NG
Series ITS (5015 Type) Reverse-Bayonet Quick-Connect for Existing Plant Class 1E Refurbishment and Retrofit Applications

IPT SE-NG
Series IPT SE (26482 Type) Bayonet-Lock Quick-Connect Connectors for Existing Plant Class 1E Refurbishment and Retrofit Applications

NG Family Accessories
Radiation-Resistant, Environmental Sealing Connector Accessories for All Classes of Nuclear Plant Interconnect Applications

BLQ
Qualification and Test Capabilities
Environmental Zone 1 Qualification and In-House Independent Test Laboratory

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Glenair SuperNG connectors have been tested and qualified to withstand the most stringent LOCA qualification criteria, including those requiring long-term submersion, 60-year thermal cycling, and long-term radiation exposure. SuperNG utilizes machined stainless steel shells and polymeric insert materials for maximum resistance to cumulative radiation, thermal, seismic, and pressure for class 1E harsh nuclear environments. Double peripheral seals ensure life-of-system environmental performance.

Built with proven reverse-bayonet technology for rapid mating and demating during maintenance cycles, and support for the broad range of military 5015 insert arrangements, the connectors can be configured in small shell sizes with as few as two signal contacts, all the way up to large size shell sizes accommodating over sixty 20-amp power contacts. Need a single 500 amp power contact layout for a three-phase motor application? The Series SuperNG supports that too.

Wire-to-connector termination is facilitated with precision-machined crimp or solder-cup contacts with ample wiring space in the connector housing for back-potting or environmental shrink boot accommodation.
**KEY PERFORMANCE ATTRIBUTES: GLENAIR SuperNG CONNECTORS**

Glenaier SuperNG connectors are optimized for containment area (Class 1E) applications in modern nuclear power plants with stringent LOCA test and performance requirements including radiation resistance, high-temperature tolerance, sealed, high-pressure tolerance, fluid/chemical resistance, and corrosion resistance. Radiation-hardened inserts, gaskets, seals, and O-rings ensure 60-year life-of-system performance and are manufactured in accordance with a 10CFR50 Appendix B quality system.

<table>
<thead>
<tr>
<th>Test</th>
<th>Zone 1 Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration aging</td>
<td>90 minutes of vibration each orthogonal axis, no discontinuity of 1 ms or greater,</td>
</tr>
<tr>
<td></td>
<td>sinusoidal motion 0.75 g from 5 Hz to 100 Hz to 5 Hz</td>
</tr>
<tr>
<td>Thermal cycling</td>
<td>13 cycles between 30°C [86°F] and 121°C [250°F]</td>
</tr>
<tr>
<td>Mechanical cycle aging</td>
<td>500 mating/un-mating cycles</td>
</tr>
<tr>
<td>Environmental Requirements</td>
<td></td>
</tr>
<tr>
<td>(Temperature and Pressure)</td>
<td></td>
</tr>
<tr>
<td>Group 1 Abnormal Operating Conditions, 18-4-h events:</td>
<td></td>
</tr>
<tr>
<td>Abnormal Temperature: (10 - 65.6°C) [50 - 150°F]</td>
<td></td>
</tr>
<tr>
<td>Abnormal Pressure: Atmospheric</td>
<td></td>
</tr>
<tr>
<td>Group 2 Abnormal Events Operating Conditions, 1-5 30-day events:</td>
<td></td>
</tr>
<tr>
<td>Abnormal Temperature: (10 – 121°C) [50 - 250°F]</td>
<td></td>
</tr>
<tr>
<td>Abnormal Pressure: ≤ 0.124 Mpa [≤18 psig]</td>
<td></td>
</tr>
<tr>
<td>Normal Service Radiation</td>
<td>60-Year Equivalent Gamma Total Integrated Dose= 4.12 E+07 rads [412 kGy]</td>
</tr>
<tr>
<td>Seismic test</td>
<td>In accordance with IEEE 344 and IEEE 382, max peak value 6.5g</td>
</tr>
<tr>
<td>Thermal Aging</td>
<td>Qualified Life 60 years</td>
</tr>
<tr>
<td>Containment pressure test</td>
<td>4.7 bar [68 psig] for 24 hours</td>
</tr>
<tr>
<td>DBA (LOCA) Test</td>
<td>DBA Operating Conditions in 1-year-long event:</td>
</tr>
<tr>
<td></td>
<td>Maximum Accident Temperature (for approx. 3 s): 216.7°C [422°F]</td>
</tr>
<tr>
<td></td>
<td>Maximum Accident Pressure (for approx. 3 s): 406.8 kPa [59 psig]</td>
</tr>
<tr>
<td></td>
<td>Post Accident Gamma Total Integrated Dose for 1 year = 3.7 E+07 rads [370 kGy]</td>
</tr>
<tr>
<td></td>
<td>Post Accident Beta Total Integrated Dose for 1 year = 2.6 E+08 rads [2600 kGy]</td>
</tr>
<tr>
<td></td>
<td>Chemical Spray 30 hours</td>
</tr>
<tr>
<td></td>
<td>Post DBA 30 days in chemical spray fluid</td>
</tr>
<tr>
<td>Post DBA test</td>
<td>1-year long immersion as per IEEE 383:09-2015, water at 85.2°C [185.38°F] pressure 0.11 Mpa [16.62 psig]</td>
</tr>
</tbody>
</table>

**GLENAIR SuperNG ZONE 1 INTERCONNECT APPLICATION SUPPORT**

SuperNG is optimized for equipment applications in containment area Class 1E including:

- Valve controls/monitoring
- Control rod drive mechanisms
- Rod position indicators
- Pressure transmitters
- Solenoids
- Hydrogen detectors
- Fuel handing equipment
- Radiation tolerant cameras
- Limit switches
- Radiation detectors
- In-core detectors
- Data acquisition equipment
- Process control monitoring
NUCLEAR-GRADE CONNECTORS
Double Peripheral Seal Interconnect for Stringent Containment Area (Class 1E) Applications
SuperNG connectors with NPT adapter

SuperNG RECEPTACLE AND PLUG WITH NPT ADAPTER

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

Rev. 06.10.19
SuperNG RECEPTACLES AND PLUG WITH ENVIRONMENTAL CABLE CLAMP

Square-Flange Receptacle

In-Line Receptacle

Plug

Double Peripheral Seal Interconnect for Stringent Containment Area (Class 1E) Applications

SuperNG connectors with environmental cable clamp

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

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NUCLEAR-GRADE CONNECTORS
Double Peripheral Seal Interconnect for Stringent Containment Area (Class 1E) Applications
SuperNG connectors with shield termination backshells

SuperNG RECEPACES AND PLUG WITH SHIELD TERMINATION BACKSHELL

Square-Flange Receptacle

In-Line Receptacle

Plug

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

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NUCLEAR-GRADE CONNECTORS
Double Peripheral Seal Interconnect for Stringent Containment Area (Class 1E) Applications
SuperNG connectors with environmental backshell or cable gland

SuperNG SQUARE-FLANGE RECEPTACLE AND PLUG WITH ENVIRONMENTAL BACKSHELL

Square-Flange Receptacle

Plug

RECEPTACLE WITH ENVIRONMENTAL CABLE GLAND

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

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CLASS 1E

Ultraminiature Mighty Mouse NG

High-pressure small form-factor connectors that meet the latest, most stringent global Zone 1E qualification standards including those requiring long-term submersion

High density, small form-factor Mighty Mouse NG connectors are designed for use in new nuclear power plant containment zone (class 1E) equipment. Series 802 Mighty Mouse NG connectors meet the most severe nuclear industry test requirements, including long-term submersion, radiation, and 60-year thermal cycle testing. The series is available in ten sizes from 1 to 130 contacts.

These ultraminiature connectors (fully half the size and weight compared to standard nuclear-grade connectors) feature high-density inserts, 316 stainless steel shells and a piston O-ring for high-pressure, 3500 psi sealing. Gold-plated crimp contacts accept #12 – #30 AWG wire. Connectors are backfilled with epoxy potting compound to achieve an open face pressure rating 1000 PSI.

- 3500 psi pressure rated
- Ultraminiature #23 contacts
- Size #20, #20HD, #16, #12, #8 signal, power, fiber optic and shielded contacts
- Discrete connectors and turnkey cable assemblies

Custom high-pressure glass sealed and bulkhead feed-thru versions available, consult factory.
NUCLEAR-GRADE CONNECTORS

Ultraminiature High-Pressure Interconnect for Stringent Containment Area (Class 1E) Applications

Mighty Mouse NG specifications

GLENAIR MIGHTY MOUSE NG DELIVERS HIGH-PRESSURE SEALING AND RUGGED DESIGN IN A MINIATURE PACKAGE

Mighty Mouse NG Plug

Mighty Mouse NG Receptacle

Stainless Steel
Available in ten sizes from 1 to 130 contacts, Series 802 connectors feature 316 stainless steel shells.

3500 psi
These connectors withstand up to 3500 PSI hydrostatic pressure in a mated condition. Potted versions withstand 1000 PSI open face pressure.

MIGHTY MOUSE NG SPECIFICATIONS AND PLUG KEY POSITIONS

<table>
<thead>
<tr>
<th>Key Position</th>
<th>Key Rotation A°</th>
<th>B°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (A)</td>
<td>150°</td>
<td>210°</td>
</tr>
<tr>
<td>B</td>
<td>75°</td>
<td>210°</td>
</tr>
<tr>
<td>C</td>
<td>95°</td>
<td>230°</td>
</tr>
<tr>
<td>D</td>
<td>140°</td>
<td>275°</td>
</tr>
<tr>
<td>E</td>
<td>75°</td>
<td>275°</td>
</tr>
<tr>
<td>F</td>
<td>9°</td>
<td>210°</td>
</tr>
</tbody>
</table>

Performance Specifications

- Current Rating: #23–5 A, #20–7.5 A, #16–13 A, #12–23 A
- Dielectric Withstanding Voltage: #23–750 VAC, #20HD–1000 VAC, #16 and #12–1800 VAC
- Insulation Resistance: 5000 megohms minimum
- Operating Temperature: -65° C. to +175° C.
- Hydrostatic Pressure: 3500 PSI mated, 1000 PSI open face (hermetic)
- Shock: 300 g.
- Vibration: 37 g.
- Durability: 2000 mating cycles

Material and Finish

- Shells, Jam Nuts, Coupling Nuts: 316 stainless steel
- Contact Retention Clip: Beryllium copper alloy

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NUCLEAR-GRADE CONNECTORS
Ultramiiniature High-Pressure Interconnect for Stringent Containment Area (Class 1E) Applications
Mighty Mouse NG connector configurations

SQUARE FLANGE RECEPTACLE WITH ACCESSORY THREAD

PLUG WITH ACCESSORY THREAD

ENVIRONMENTAL EMI/RFI SHIELD TERMINATION AND SHRINK BOOT ADAPTER

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog
NUCLEAR-GRADE CONNECTORS
Ultraminiature High-Pressure Interconnect for Stringent Containment Area (Class 1E) Applications

Mighty Mouse NG cable harness configurations

**CABLE HARNESS WITH MIGHTY MOUSE NG PLUG**

![Cable Harness with Mighty Mouse NG Plug](image)

**CABLE HARNESS WITH MIGHTY MOUSE NG PLUG AND CASTLE GRIP BACKSHELL**

![Cable Harness with Mighty Mouse NG Plug and Castle Grip Backshell](image)

**CABLE HARNESS WITH MIGHTY MOUSE NG JAM NUT RECEPTACLE**

![Cable Harness with Mighty Mouse NG Jam Nut Receptacle](image)

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

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Glenair ITS-NG series connectors meet previous-generation nuclear industry LOCA test requirements and are suitable for equipment retrofit and refurbishment applications for power plants with legacy containment zone 1E requirements. These industry-standard reverse bayonet lock connectors offer fast and reliable mating and demating. The Nuclear-Grade ITS series connector is Glenair’s qualified equivalent for MIL-DTL-5015 (VG95135) reverse-bayonet connectors. The popular series offers hundreds of crimp-contact power and signal insert arrangements with gold-plated copper contacts. Polymeric insert materials deliver maximum radiation and temperature tolerance, as well as long-term durability. Stainless steel, environmentally-resistant materials are fabricated in accordance with NQA-1 (10CFR50 Appendix B). All material selections meet cumulative radiation, thermal, seismic, and pressure-induced stress factors for legacy class 1E harsh nuclear environments.

- Fast connect / disconnect reverse-bayonet coupling
- High corrosion-resistant stainless steel shells and bodies
- Chemical and moisture-resistant inserts and O-rings
- Performance tested for advanced temperature, radiation, and seismic stress factors
- Ideally suited for power generation monitoring, valve control devices, sensors, and other electronic equipment in Class 1E harsh nuclear / safety-related applications

CLASS 1E
Series ITS-NG Reverse-Bayonet Coupling
Nuclear industry standard power and signal connectors for existing plant refurbishment
NUCLEAR-GRADE CONNECTORS
Reverse-Bayonet (5015 type) Interconnect for Legacy Containment Area (Class 1E) Applications
Series ITS-NG applications and specifications

**GLENAIR SERIES ITS-NG APPLICATION NOTES**

- Glenair Series ITS-NG connectors are based on the MIL-DTL-5015 standard, but feature an improved reverse-bayonet coupling technology in place of the threaded interface used in MIL-DTL-5015.
- The ITS-NG family of connectors features improved O-ring sealing and other design enhancements for applicability in containment area (Class 1E) / safety-related applications, particularly in existing or older nuclear facilities with legacy LOCA test requirements. For new interconnect applications in modern-day power plants, Glenair recommends the SuperNG or Mighty Mouse NG series connectors currently undergoing qualification to the latest LOCA test and long-term durability requirements.
- ITS-NG is an industry-standard connector design, intermateable and intermountable with all other 5015-based reverse-bayonet connector series. The ITS-NG is considered particularly appropriate for retrofit and refurbishment applications as the 3-point bayonet coupling mechanism reduces mating time—an important consideration in time-sensitive plant refurbishment work. Positive locking of the three stainless steel pins provides reliable resistance to vibration and shock, and prevents connector de-coupling in severe vibration applications.
- Both plug and receptacle connector configurations are available with dynamic peripheral seals for environmental sealing. Equipped with appropriate backshells and accessories, the connectors are submersible for up to 1 year at 85°C to 1m depth.
- Glenair Series ITS-NG connectors share the same insert arrangements, shell dimensions, supported contacts, and electrical performance ratings as MIL-DTL-5015 and VG 95234 and are fully interchangeable with VG standard connectors.
- Glenair ITS-NG connectors are particularly well-suited for use in applications where electromagnetic compatibility is a requirement. A complete range of EMI shield termination accessories is available for both overall as well as individual wire shields.

**CONTACT SPECIFICATIONS**

**Copper alloy with gold plating (standard)**

<table>
<thead>
<tr>
<th>Contact Size</th>
<th>Rated Current at 20 C</th>
<th>Rated Current at 80 C</th>
<th>Max. Contact Resist.</th>
<th>Wire size</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>7.5 A</td>
<td>7.5 A</td>
<td>12.0 mΩ</td>
<td>20-26 AWG</td>
</tr>
<tr>
<td>18</td>
<td>10 A</td>
<td>7.5 A</td>
<td>12.0 mΩ</td>
<td>18-26 AWG</td>
</tr>
<tr>
<td>16</td>
<td>22 A</td>
<td>13 A</td>
<td>6.0 mΩ</td>
<td>16-22 AWG</td>
</tr>
<tr>
<td>12</td>
<td>41 A</td>
<td>23 A</td>
<td>3.0 mΩ</td>
<td>12-14 AWG</td>
</tr>
<tr>
<td>8</td>
<td>73 A</td>
<td>46 A</td>
<td>1.0 mΩ</td>
<td>8-10 AWG</td>
</tr>
<tr>
<td>4</td>
<td>135 A</td>
<td>80 A</td>
<td>0.5 mΩ</td>
<td>4-6 AWG</td>
</tr>
<tr>
<td>0</td>
<td>245 A</td>
<td>150 A</td>
<td>0.3 mΩ</td>
<td>0-2 AWG</td>
</tr>
<tr>
<td>4/0</td>
<td>350 A</td>
<td>225 A</td>
<td>0.2 mΩ</td>
<td>4/0 AWG</td>
</tr>
</tbody>
</table>

**SERVICE RATING**

(Minimum Insulating resistance: ≥ 5 x 10³ MΩ)

<table>
<thead>
<tr>
<th>Class</th>
<th>Operating voltage Vdc</th>
<th>Operating voltage Vac RMS</th>
<th>Test voltage Vac RMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INST.</td>
<td>250 V</td>
<td>200 V</td>
<td>1000 V</td>
</tr>
<tr>
<td>A</td>
<td>700 V</td>
<td>500 V</td>
<td>2000 V</td>
</tr>
<tr>
<td>D</td>
<td>1250 V</td>
<td>900 V</td>
<td>2800 V</td>
</tr>
<tr>
<td>E</td>
<td>1750 V</td>
<td>1250 V</td>
<td>3500 V</td>
</tr>
<tr>
<td>B</td>
<td>2450 V</td>
<td>1750 V</td>
<td>4500 V</td>
</tr>
<tr>
<td>C</td>
<td>4200 V</td>
<td>3000 V</td>
<td>7000 V</td>
</tr>
</tbody>
</table>

**Materials and Finishes**

<table>
<thead>
<tr>
<th>Shells, Coupling Nuts</th>
<th>316 Stainless Steel, Passivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts</td>
<td>Copper alloy, Gold Plated</td>
</tr>
<tr>
<td>Hoods (Socket contacts)</td>
<td>Copper Alloy, Nickel Plated</td>
</tr>
<tr>
<td>Pencil Clip (Socket contacts)</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Wave Spring</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Grounding Finger</td>
<td>Beryllium Copper</td>
</tr>
</tbody>
</table>

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ITS-NG RECEPTACLE AND PLUG WITH NPT ADAPTER

ITS-NG RECEPTACLES AND PLUG WITH ENVIRONMENTAL CABLE GLAND

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog
NUCLEAR-GRADE CONNECTORS
Reverse-Bayonet (5015 type) Interconnect for Legacy Containment Area (Class 1E) Applications
Series ITS-NG connectors with environmental cable clamp or backshell

ITS-NG RECEPTACLES AND PLUG WITH ENVIRONMENTAL CABLE CLAMP

Square-Flange Receptacle

In-Line Receptacle

Plug

ITS-NG SQUARE-FLANGE RECEPTACLE AND PLUG WITH ENVIRONMENTAL BACKSHELL

Square-Flange Receptacle

Plug

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NUCLEAR-GRADE CONNECTORS

Reverse-Bayonet (5015 type) Interconnect for Legacy Containment Area (Class 1E) Applications

Series ITS-NG connectors with shield termination backshell

ITS-NG RECEPTACLES AND PLUG WITH SHIELD TERMINATION BACKSHELL

Square-Flange Receptacle

In-Line Receptacle

Plug

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog
NUCLEAR-GRADE CONNECTORS
Reverse-Bayonet (5015 type) Interconnect for Legacy Containment Area (Class 1E) Applications
Series ITS-NG connectors with special backshell configurations

PLUG WITH INTERNAL STRAIN RELIEF AND SHIELD TERMINATION

IN-LINE AND PANEL MOUNT RECEPTACLE WITH EMI/RFI SHIELDING ENVIRONMENTAL BACKSHELL

SQUARE-FLANGE RECEPTACLE WITH ACCESSORY THREAD

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog
Glenair Nuclear-Grade IPT SE Bayonet-Lock Signal Connectors are ideally suited for general and Class 1E harsh environment nuclear applications where reliable mating and quick connection and disconnection of safety zone connectors is required.

The nuclear-grade concept of the VG95328 bayonet mechanism provides fast and easy coupling, especially when the connector is situated in an awkward or hard to reach location.

Supplied crimp contacts are gold-plated copper alloy. Inserts are made from high-insulation synthetic rubber, high-temperature and radiation resistant from -40°C to +125°C.

**Intermateability**

Nuclear-Grade Series IPT SE connectors are interchangeable and intermateable with the wide range of industry-standard bayonet connectors designed around MIL-DTL-26482 Series I and/or qualified to VG 95328.

Glenair can also accommodate custom changes and modifications to meet compatibility requirements with previously installed legacy connectors.

**MAIN TECHNICAL CHARACTERISTICS**

- High-performance crimp version with integral contact retention clips
- Two contact sizes: #20 and #16
- 21 signal contact insert arrangements, 3 to 61 contacts
- Rear-insertion/front release snap-in contacts
- Intermateable with other MIL-DTL-26482 Series I connectors
- Environmentally sealed system
- Audible and visual coupling indicators
- Keyed polarization
NUCLEAR-GRADE CONNECTORS
Bayonet-Lock (26482 type) Interconnect for Legacy Containment Area (Class 1E) Applications
Series IPT SE-NG

**Service Rating**

<table>
<thead>
<tr>
<th>Class</th>
<th>Operating Voltage AC</th>
<th>Operating Voltage DC</th>
<th>Test Voltage AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>600</td>
<td>700</td>
<td>1500</td>
</tr>
<tr>
<td>II</td>
<td>1000</td>
<td>1250</td>
<td>2300</td>
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</table>

**Maximum Voltage Drop**

<table>
<thead>
<tr>
<th>Contact Size</th>
<th>Test Current</th>
<th>Voltage Drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>7.5 A</td>
<td>25 mV</td>
</tr>
<tr>
<td>16</td>
<td>13.0 A</td>
<td>21 mV</td>
</tr>
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</table>

**Materials & Finishes**

- **Shells, Coupling Nuts**: 316 Stainless Steel, Passivated
- **Contacts**: Copper alloy, Gold Plated
- **Contact Retainer**: Semicrystalline High-temperature engineering thermoplastic
- **Wave Spring**: Stainless Steel
- **Grounding Finger**: Beryllium Copper, Gold Plated

**INSERT ARRANGEMENT**

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<tr>
<th>Arrangement</th>
<th>Service Rating</th>
<th>Dim. contact size</th>
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<tr>
<td></td>
<td></td>
<td>20  16</td>
</tr>
<tr>
<td>8 - 2</td>
<td>I</td>
<td>2</td>
</tr>
<tr>
<td>8 - 3A</td>
<td>I</td>
<td>3</td>
</tr>
<tr>
<td>8 - 4</td>
<td>I</td>
<td>4</td>
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<tr>
<td>8 - 33</td>
<td>I</td>
<td>3</td>
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<tr>
<td>10 - 6</td>
<td>I</td>
<td>6</td>
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<tr>
<td>10 - 7</td>
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<td>7</td>
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<td>12 - 3</td>
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<td>14 - 19</td>
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<td>18 - 11</td>
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<td>18 - 32</td>
<td>I</td>
<td>10</td>
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<td>20 - 16</td>
<td>I</td>
<td>10</td>
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<td>20 - 39</td>
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<td>20 - 41</td>
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<td>22 - 21</td>
<td>I</td>
<td>10</td>
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<td>22 - 55</td>
<td>I</td>
<td>10</td>
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<tr>
<td>24 - 61</td>
<td>I</td>
<td>10</td>
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**INSERT ROTATION ALTERNATE POSITIONS**

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<thead>
<tr>
<th>Arrangement</th>
<th>Degrees</th>
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Insert Rotation (front view)
NUCLEAR-GRADE CONNECTORS

Bayonet-Lock (26482 type) Interconnect for Legacy Containment Area (Class 1E) Applications

Series IPT SE-NG connector configurations

**SQUARE-FLANGE RECEPTACLE WITH ENVIRONMENTAL CABLE CLAMP**

**PLUG WITH ENVIRONMENTAL CABLE CLAMP**

**SQUARE-FLANGE RECEPTACLE WITH ENVIRONMENTAL CABLE GLAND**

*Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog*
NUCLEAR-GRADE CONNECTORS

Bayonet-Lock (26482 type) Interconnect for Legacy Containment Area (Class 1E) Applications

Series IPT SE-NG connector configurations

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PLUG WITH ENVIRONMENTAL CABLE GLAND

---

PANEL-MOUNT SQUARE-FLANGE RECEPTACLE WITH ENV SHIELD TERMINATION BACKSHELL

---

PLUG WITH ENVIRONMENTAL SHIELD TERMINATION BACKSHELL

---

Complete dimensions and specifications provided in Glenair Nuclear-Grade Connectors catalog

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ENVIRONMENTAL ZONE 1 QUALIFICATION

Glenair recently reached an important milestone with the qualification of a cable assembly program for a major global nuclear client. Included in these assemblies were our Mighty Mouse NG plug/receptacle connectors, EPDM O-Rings, and Glenair’s proprietary epoxy resin.


Dry heat thermal aging totaling 1 month at 120 °C as per EN 60068-2-2:2007, 24h dampheat at 95% RH as per 60068-2-78:2013,
Irradiation 67 kGy of 60Co as per EN 60544-2:2012,
Seismic testing as per CEI 60980:1989 and CEI 60068-2-57:2013,
Watertightness for 24h under 2 bar as per EN 60068-2-18:2001.

Testing required a 52-year lifespan condition, final electrical testing confirmed that the assemblies would perform their job flawlessly over the required period.

132 ° C for 770h, representing a 60 year-long lifespan, and watertightness testing at 8 bar for 24h, as per IEEE 572:2006 / MIL-DTL-5015H / VG95328-1:12/96.

Upcoming product qualification will have our connectors undergo the following:
60-Year Equivalent conditions inside Zone 1 harsh environment.
Thermal cycling between 30 °C and 121 °C
Mechanical aging, thermal aging at 120 °C
Normal Service and DBA radiation aging totaling 4,12 E+07 rads of Gamma Dose
Vibration Aging and Seismic Testing as per IEEE 344, IEEE 323 and IEEE 382
Containment Pressure Test at 4,7 bar for 24 h

Design Basis Accident (DBA) and Post DBA Test - with such extremes as max. Temp 216,7 ° C
Max, 30h-long chemical spray
1-year long immersion in water.
### AP1000 Environmental Zone 1 Qualification

<table>
<thead>
<tr>
<th>Test</th>
<th>Zone 1 Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vibration aging</strong></td>
<td>90 minutes of vibration each orthogonal axis, no discontinuity of 1 ms or greater, sinusoidal motion 0.75 g from 5 Hz to 100 Hz to 5 Hz</td>
</tr>
<tr>
<td><strong>Thermal cycling</strong></td>
<td>13 cycles between 30 °C [86 °F] and 121 °C [250 °F]</td>
</tr>
<tr>
<td><strong>Mechanical cycle aging</strong></td>
<td>500 mating/un-mating cycles</td>
</tr>
</tbody>
</table>
| **Environmental Requirements** | Normal Operating Conditions:  
  Normal Temperature: (10 - 48,9 °C) [50 -120 °F]  
  Normal Pressure: -0.001 +0.007 Mpa [-0.2 +1.0 psig]  
  Abnormal Operating Conditions, 18 4-h events:  
  Abnormal Temperature: (10 - 65,6 °C) [50 -150 °F]  
  Abnormal Pressure: Atmospheric  
  Group 2 Abnormal Events Operating Conditions, 1-5 30-day events:  
  Abnormal Temperature: (10 – 121 °C) [50 - 250 °F]  
  Abnormal Pressure: ≤ 0.124 Mpa [≤18 psig]  
**Normal Service Radiation** | 60-Year Equivalent Gamma Total Integrated Dose= 4,12 E+07 rads [412 kGy]                                                                                                                                               |
| **Seismic test**           | In accordance with IEEE 344 and IEEE 382, max peak value 6.5g                                                                                                                                                            |
| **Thermal Aging**          | Qualified Life 60 years                                                                                                                                                                                                  |
| **Containment pressure test** | 4,7 bar [68 psig] for 24 hours                                                                                                                                                                                          |
| **DBA (LOCA) Test**        | DBA Operating Conditions in 1-year-long event:  
  Maximum Accident Temperature (for approx. 3 s): 216.7 °C [422°F]  
  Maximum Accident Pressure (for approx. 3 s): 406.8 kPa [59 psig]  
  Post Accident Gamma Total Integrated Dose for 1 year = 3.2 E+07 rads [370 kGy]  
  Post Accident Beta Total Integrated Dose for 1 year = 2.6 E+08 rads [2600 kGy]  
  Chemical Spray 30 hours  
  Post DBA 30 days in chemical spray fluid                                                                                                                                                                               |
| **Post DBA test**          | 1-year long immersion as per IEEE 383:09-2015, water at 85,2 °C [185,38 °F] pressure 0,11 Mpa [16,62 psig]                                                                                                            |
Environmental testing, consisting of the complete range of mechanical, electrical and environmental stress factors that affect electronic equipment, cabling, and systems is now available from Glenair’s IEC/IECQ certified testing laboratories. Test engineers and technicians follow qualified processes, and report generation protocols to deliver timely and professional environmental testing services. As an interconnect component manufacturer and wire and cable assembly supplier, Glenair is well-versed in all aspects of qualification testing including corrosion resistance, solvent resistance, electromagnetic compatibility, dielectric withstanding voltage, current rating and so on. Our test laboratories are equipped with current-generation equipment, and are maintained in accordance with industry best practices and certification agency requirements. Perhaps most importantly, Glenair environmental test services are offered with accelerated lead times—from initial quoting to final test report delivery. Please contact the factory for more information.

- Mechanical / dynamic testing for fiber optic systems, electrical components, wiring harnesses
- Broad spectrum of electrical testing (resistance, current rating, EMC shielding and more)
- Heat, cold, and thermal shock testing
- Corrosion and solvent resistance testing
- Fast turnaround on quotes and testing services
- Decades of experience
IEC QUALITY ASSESSMENT SYSTEM FOR ELECTRONIC COMPONENTS (IECQ)

IEC Certificate of Approval
Independent Testing Laboratory

IECQ Certificate No.: IECQ-L BSI 13.0001
CB Certificate No.: T598257 IECQ

Schedule of Scope to Certificate of Approval
Independent Testing Laboratory

Schedule Number: IECQ-L BSI 13.0001-S
Bar No.: 2
Revision Date: 2016/11/07
Page 1 of 1

CONDTIONS OF TESTING

ENVIRONMENTAL

Cold

BS EN 60068

Dry Heat

BS EN 60068

Damp Heat - Steady State

BS EN 60068

Damp Heat - Cyclic

BS EN 60068

Change of Temperature

BS EN 60068

Salt Mist

BS EN 60068

MECHANICAL

Vibration, unidirectional

BS EN 60068

Vibration, random

BS EN 60068

Shock

BS EN 60068

CONNECTORS FOR ELECTRONIC EQUIPMENT

BS EN 60512

BS EN 60512

BS EN 60512

BS EN 60512

BS EN 60512

BS EN 60512

BS EN 60512

BS EN / IEC

MEASUREMENT CAPABILITIES (Parameters)

DC Voltage, DC Current, AC Voltage, AC Current, DC Resistance, Temperature, Humidity.

ELECTRICAL PRODUCT TESTS

Resistors, Printed Circuits, Switches, Relays, Connectors, Transformers, Electrical Harnesses.
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