10K PSI / 689 BAR / 7000M

Marine Molded™ Series GLMC

Technical Datasheet

Introduction:

Glenair Marine Molded (Series GLMC) rubber molded connectors are fabricated using the highest-grade materials and quality controls. Prewired In-Line and Bulkhead Connectors are supplied in symmetrical layouts from two-to-sixteen contacts for Subsea ROV, Towed-Array, Offshore Oil, and other Harsh Oil & Gas industry applications. This industry-standard connector series is fully compatible (intermountable and intermateable) with other connector series of this type up to 10,000 PSI.

Test Requirements:

Test Description	Parameters	Test Method
Electrical		
Low-Level Contact Resistance	Current: 100mA, Open Circuit Voltage: 20mV	EIA-364-23
Insulation Resistance	Voltage: 500Vdc, Dwell: 60s	EIA-364-21
Dielectric Withstand Voltage	Voltage: 900Vdc / 1800Vdc*	EIA-364-20
Current Carrying Capacity	Current: 5A / 10A*	EIA-364-70
Environmental		
Temperature Cycling - Thermal Shock	High Temp: +105°C, Low Temp: -20°C, Cycles: 5	EIA-364-32
Temperature Cycling - Gradual Rate	High Temp: +70°C, Low Temp: -10°C, Cycles: 5, Gradient: > 5°C/min	EIA-364-21
Thermal Shock - Immersion	Air Temp (A): +70°C, Air Temp (B): -40°C Immersion Water Temp: 0°C, Cycles: 3	API standard 17F
Salt Mist Corrosion - Steady State	Temp: +35°C, Duration: 500 Hours, Solution: 5% NaCl	EIA-364-26
Durability		
500 Mating Cycles - Dry Mate		EIA-364-09
500 Mating Cycles - Wet Mate		EIA-364-09
Subsea Performance		
Hydrostatic Pressure - Mated	Type: Cyclic, Pressure: Levels up to 15,000 PSI Total Duration: 95mins	EIA-364-39
Hydrostatic Pressure - Open	Type: Static, Pressure: 150 PSI Total Duration: 120mins	EIA-364-39

* 1800VDC & 10A for 2-Way Contact Arrangements.

** Custom Conditions Applied (-10°C to +70°C)

Testing Sequence:

The samples were divided into 5 subgroups as described in the qualification test plan, testing was then carried out in the sequence below, as defined in the Qualification Test Plans (QTP).

Initially, all samples (barring Group 5 - Salt Mist Corrosion) submitted for Qualification Testing were subjected to a conditioning sequence “Group 0”, before then proceeding to their relevant Qualification Test sequence.

Group 0 QTP-(018/019/020)-2024	Test Subgroups				
Para. - Requirement	1	2	3	4	5
8.1 - Visual Inspection and Dimensions	✓	✓	✓	✓	
8.2 - Low Level Line Resistance	✓	✓	✓	✓	
8.3 - Insulation Resistance	✓	✓	✓	✓	
8.4 - Dielectric Withstand Voltage	✓	✓	✓	✓	
8.6 - Temperature Cycling - Thermal Shock	✓	✓	✓	✓	
8.1 - Visual Inspection and Dimensions	✓	✓	✓	✓	✓

Qualification QTP-(018/019/020)-2024	Test Subgroups				
Para. - Requirement	1	2	3	4	5
8.1 - Visual Inspection and Dimensions	✓	✓	✓	✓	✓
8.2 - Low Level Line Resistance	✓				
8.3 - Insulation Resistance	✓	✓	✓		
8.4 - Dielectric Withstand Voltage		✓	✓		
8.5 - Current Carrying Capacity				✓	
8.7 - Temperature Cycling - Gradual Rate		✓			
8.8 - Salt Mist Corrosion					✓
8.9 - Hydrostatic Pressure - Mated	✓				
8.10 - Hydrostatic Pressure - Open	✓				
8.11 - Durability - Dry Mate		✓			
8.12 - Durability - Wet Mate			✓		
8.13 - Thermal Shock - Immersion			✓		

✓ = Applicable

Test Methods:

Visual Inspection & Dimensions (8.1):
All Qualification samples shall be inspected visually for damage or defects that will impact performance, including (but not limited to); shell damage, plating cracks or imperfections, bent or misaligned contacts, etc.

Low Level Line Resistance (8.2):
When tested with a Micro-Ohmmeter, a Low Level circuit delivering a test current of 100mA & a maximum open circuit voltage of 20mV, shall be applied to each line within the connector pair, conducted in accordance with EIA-364-23.

Insulation Resistance - IR (8.3):
Insulation Resistance is to be measured separately between each contact to all other contacts plus the connectors shell, tested at 500Vdc (± 10%) for 60s, conducted in accordance with EIA-364-21.

Dielectric Withstanding Voltage - DWV (8.4):
Conducted while at Sea Level (ambient air pressure conditions), tested at 900Vdc (1800Vdc for 2-Way samples), for 60s, in a two-group format (Odds vs. Evens), connectors shall show no signs of breakdown or flashover when subjected to the DWV test in accordance with EIA-364-20, Method B.

Current Carrying Capacity - Specified Current (8.5):
The specified test current of 5A (10A for 2-Way samples) shall be applied to 4 contacts wired in series, and the temperature rise of the series circuit shall not exceed 30°C when tested in accordance with EIA-364-70, Method 1.

Temperature Cycling - Thermal Shock (8.6):
Mated connector samples shall be exposed to 5 Cycles of Air-to-Air Thermal Shock, from a minimum temperature of -20°C to a maximum temperature of +105°C, in accordance with EIA-364-32, Test Duration B.

Temperature Cycling - Gradual Rate of Change (8.7):
Mated connector samples shall be exposed to 5 Cycles, from a minimum temperature of -10°C to a maximum temperature of +70°C, with a rate of change of around 5°C/min, in accordance with EIA-364-110. With functional checks IAW 8.2 & 8.3.

Salt Mist Corrosion (8.8):
The connector samples shall show no exposure of base metal due to corrosion, when subjected to the Salt Mist Corrosion test, at 35°C with 5%NaCl, for a duration of 500 Hours exposure (0.5 to 3.0ml/hour fallout rate) conducted IAW EIA-364-26.

Hydrostatic Pressure - Mated (8.9):
Samples shall be mated & mounted inside the Hydrostatic Chamber, and subjected to a cyclic test procedure with upper pressure levels up to 15,000 PSI with reference to EIA-364-39.

Hydrostatic Pressure - Open Face (8.10):
Samples shall be shall be tested in an open face condition inside the Hydrostatic Chamber, and subjected to a static 2 Hour pressure hold at 150 PSI with reference to EIA-364-39.

Durability, 500 Cycles - Dry Mate (8.11):
Connectors shall be subjected to 500 mating cycles by hand, and show no signs of damage or degradation to electrical performance. Durability performance in accordance with EIA-364-09, and with IR assessed at 50 cycle intervals IAW 8.2.

Durability, 500 Cycles - Wet Mate (8.12):
Shall be subjected to 500 mating cycles by hand, including immersion into water (unmated condition) during each mating cycle, showing no signs of damage. Performed with reference to EIA-364-09, with IR assessed at intervals IAW 8.2.

Thermal Shock - Immersion (8.13):
Samples shall be heated to +70°C and cooled -40°C and rapidly immersed water at a temperature between 0°C to +4.5°C for 3 cycles, with reference to the guidance within API standard 17F - B.7.3.6.1.

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Test Results Summary:

Test Description	Requirements	Results Summary
Electrical		
Low Level Line Resistance 100mA, 20mV Max.	Line Resistance to be < 100mΩ	Pass ✓
Insulation Resistance 500Vdc (± 10%), 60s Dwell.	IR to be > 1000MΩ (1GΩ)	Pass ✓
Dielectric Withstand Voltage 900Vdc / 1800Vdc, 60s Dwell.	No evidence of breakdown / flashover, Leakage Current to be < 5mA	Pass ✓
Current Carrying Capacity Specified Current: 5A / 10A	Temperature Rise to be < 30°C	Pass ✓
Environmental		
Temperature Cycling - Thermal Shock Tmax = +105°C, Tmin = -20°C, 5 Cycles.	No damage detrimental to the operation of the connectors	Pass ✓
Temperature Cycling - Gradual Rate Tmax = +70°C, Tmin = -10°C, 5 Cycles, 5°C/min.	IR to be > 100MΩ (@ +70°C) IR to be > 500MΩ (@ -10°C)	Pass ✓
Thermal Shock - Immersion Tmax = +70°C, Tmin = -40°C, 3 Cycles Immersion.	IR to be > 1000MΩ (1GΩ) Line Resistance to be < 100mΩ	Pass ✓
Salt Mist Corrosion - Steady State T = +35°C, 500 Hours, 5%NaCl.	No evidence of corrosion with base metal, pitting, cracking or delamination	Pass ✓
Durability		
500 Mating Cycles - Dry Mate 500 Cycles, Manual, in free air only.	Connector pairs shall be free from damage typical wear & tear is acceptable	Pass ✓
500 Mating Cycles - Wet Mate 500 Cycles, Manual, with water submersion.	Connector pairs shall be free from damage typical wear & tear is acceptable	Pass ✓
Subsea Performance		
Hydrostatic Pressure - Mated 11,000 to 15,000 PSI, 8 Cycles Total.	Samples to be free from deformation or typical wear & tear is acceptable	Pass ✓
Hydrostatic Pressure - Open Face 150 PSI, Static, 2 Hour Dwell.	Samples to be free from deformation or damage, IR to be > 1000MΩ @ 250Vdc.	Pass ✓

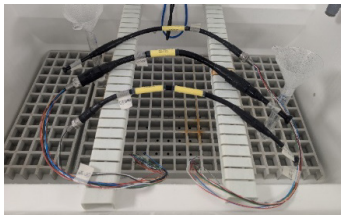

Image Shows Salt Spray Testing