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**SUBJECT: INSTALLATION & OPERATION MANUAL FOR DRY-MATE STYLE CONNECTORS**

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1.0 **INTRODUCTION:**

THIS INSTALLATION AND OPERATION MANUAL COVERS THE SUBMERSIBLE DRY-MATE STYLE PLUG AND RECEPTACLE CONNECTOR. THE CONNECTOR'S OUTLINE AND INTERFACE DETAILS ARE PROVIDED ON THE DRAWING REFERENCED ON THE COVER SHEET.

**NOTE: THIS IS A GENERIC MANUAL COVERING ALL SUBMERSIBLE DRY-MATE STYLE CONNECTORS. ANY PROJECT SPECIFIC INSTRUCTIONS, SUCH AS FIELD-INSTALLABLE TERMINATIONS, WILL BE DEALT WITH IN A SEPARATE DOCUMENT.**

2.0 **INSTALLATION:**

IN GENERAL, SUBMERSIBLE DRY-MATE CONNECTORS ARE SIMPLE AND STRAIGHTFORWARD TO INSTALL, USUALLY WITHOUT THE NEED FOR SPECIAL TOOLS. HOWEVER, THE FOLLOWING SECTIONS SHOULD BE READ TO PREVENT DAMAGE TO THE CONNECTORS. NOTE, WHERE CABLE TERMINATION WORK AND MOUNTING ARE CARRIED OUT BY THOSE OTHER THAN OCEAN DESIGN, THEN THE RESPONSIBILITY FOR THAT WORK LIES WITH THE CUSTOMER OR HIS SUBCONTRACTOR AND THE FOLLOWING INFORMATION IS PROVIDED FOR GUIDANCE ONLY.

2.1 **ELECTRICAL CIRCUITS**

FOR ELECTRICAL CIRCUITS, THE SOLDER BUCKET CAN ACCOMMODATE WIRE SIZES UP TO 16 AWG. CONVENTIONAL SOLDERING TECHNIQUES SHOULD BE EMPLOYED TO ENSURE GOOD JOINTS.

2.2 **ELECTRICAL SPLICE BOOT SEALS**

IF RUBBER "MECHANICAL" BOOT SEALS ARE EMPLOYED, THEN BOTH WIRE JACKET AND BOOT SEAL NIPPLE SHOULD BE CLEANED WITH ALCOHOL (VERIFY WIRE JACKET IS COMPATIBLE WITH ALCOHOL), DRIED AND THEN LIGHTLY LUBRICATED WITH SILICONE LUBRICANT (E.G., DC-4 LUBRICANT). TAKE CARE TO ENSURE THE WIRE IS CUT CLEANLY AND THAT NO SHARP EDGES OR STRAY WIRES ARE STICKING OUT THAT MAY DAMAGE THE SPLICE BOOT SEALS DURING INSTALLATION.

IT IS RECOMMENDED THAT THE INTEGRITY TEST OF SEALS BE VERIFIED USING STANDARD INSULATION RESISTANCE TEST PRACTICES.

**NOTE: IF OTHER CLEANING AGENTS OR SOLVENTS ARE TO BE USED, CONTACT OCEAN DESIGN FOR CONFIRMATION OF THEIR COMPATIBILITY WITH THE PLASTIC AND RUBBER PARTS OF THE CONNECTOR.**

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### 2.3 OPTICAL CIRCUITS

THESE CONNECTORS ARE SUPPLIED WITH CUSTOM MANUFACTURED OPTICAL CIRCUITS. THEY ARE OF THE CERAMIC FERRULE TYPE AND ANY DAMAGE TO AN OPTICAL CIRCUIT WILL NECESSITATE RETURN OF THE WHOLE CONNECTOR TO ODI. THE CONNECTORS ARE ALWAYS SUPPLIED WITH OPTICAL FIBER PIGTAILS, 125/900 $\mu$ M OR 125/250 $\mu$ M EITHER SINGLE OR MULTI-MODE DEPENDING UPON CUSTOMER REQUIREMENTS. AS WITH ALL OPTICAL CONNECTIONS, CARE SHOULD BE TAKEN TO ENSURE THE OPTICAL CONTACTS ARE KEPT CLEAN AND NOT EXPOSED TO ANY DIRT OR DEBRIS. CLEANING, IF REQUIRED, SHOULD BE LIMITED TO THE USE OF LINT-FREE WIPES. THERE IS NO NEED TO USE ANY OPTICAL GEL WHILE MATING THESE CONNECTORS.

### 2.4 O-RINGS

BOTH THE PLUG AND RECEPTACLE ARE TYPICALLY SUPPLIED WITH ALL O-RINGS REQUIRED FOR SEALING THE CONNECTOR ONTO ITS MOUNTING. NORMALLY, THESE ARE NITRILE O-RINGS AND THEIR COMPATIBILITY WITH THE CONTAINED FLUID (IF ANY) SHOULD BE CONFIRMED. THE O-RINGS ARE SUPPLIED IN A SEPARATE BAG. PRIOR TO INSTALLATION, ENSURE THAT THE O-RING GROOVE IN THE CONNECTOR IS CLEAN. LIGHTLY LUBRICATE THE O-RING WITH SILICONE LUBRICANT AND INSTALL IN GROOVE. THE CONNECTORS ARE SUPPLIED WITH THEIR SHELL SEAL O-RINGS PRE-INSTALLED AND LIGHTLY LUBRICATED. THE CONDITION OF THESE O-RINGS SHOULD BE VERIFIED PRIOR TO CONNECTION. SPARE O-RINGS MAY BE OBTAINED FROM ODI.

### 2.5 CONNECTOR MATING

THESE CONNECTORS ARE DRY-MATE SUBMERSIBLE TYPE. MATING SHOULD, THEREFORE, BE DONE IN A DRY AND CLEAN ENVIRONMENT. THERE ARE SEALING O-RINGS IN BOTH HALVES OF THE CONNECTOR. THEIR CONDITION SHOULD BE INSPECTED PRIOR TO MATING. TO MATE THE CONNECTORS, LIGHTLY PUSH THE CONNECTOR SHELLS TOGETHER AND ROTATE THE LOCKING SLEEVE UNTIL THE ALIGNMENT KEYWAY IN THE PLUG FINDS THE KEY IN THE RECEPTACLE. WHILE APPLYING 10 TO 30 LBS. OF AXIAL FORCE TO THE PLUG TERMINATION, ROTATE THE LOCKING SLEEVE CLOCKWISE TO ENGAGE THE THREADS. THE LOCKING SLEEVE SHOULD BE FULLY HAND TIGHTENED WHILE APPLYING AXIAL FORCE TO THE TERMINATION UNTIL SNUG. THE LOCKING SLEEVE SHOULD THEN BE TIGHTENED TO 30 $\pm$ 5 IN.LBS. WITH THE USE OF A TORQUE WRENCH.

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## 2.6 GENERAL NOTES OF CAUTION

DO **NOT**, UNDER ANY CIRCUMSTANCES, INSERT ANYTHING INTO THE SUBMERSIBLE DRY-MATE RECEPTACLE EXCEPT THE SUBMERSIBLE DRY-MATE PLUG. INSERTION OF FOREIGN OBJECTS SUCH AS TEST PROBES WILL MOST LIKELY DAMAGE THE ELECTRICAL CONTACTS AND OPTICAL JUNCTIONS. SIMILARLY, PROBING THE SUBMERSIBLE DRY-MATE PLUG COULD RESULT EITHER IN CRACKING OF THE PIN INSULATION OR DAMAGING THE OPTICAL JUNCTION.

GREAT CARE SHOULD BE TAKEN NOT TO DROP THESE CONNECTORS. THEIR SOLDER POTS AND FIBER PIGTAILS ARE VULNERABLE TO MECHANICAL DAMAGE PRIOR TO TERMINATION.

**LIVE CONNECTION AND DISCONNECTION** - THESE CONNECTORS ARE NOT DESIGNED TO BE CONNECTED OR DISCONNECTED WHILE POWER IS APPLIED TO THE ELECTRICAL CIRCUITS. **SEVERE** DAMAGE (INCLUDING CONNECTOR FAILURE) CAN OCCUR IF THIS IS DONE. IN THE EVENT THAT LIVE CONNECTION MAY OCCUR OR HAS OCCURRED, PLEASE CONTACT OCEAN DESIGN FOR FURTHER GUIDANCE.

## 3.0 OPERATION:

SUBMERSIBLE DRY-MATE CONNECTORS REQUIRE NO SPECIAL INSTRUCTIONS REGARDING THEIR OPERATION. THE FOLLOWING LISTS THE CAPABILITIES OF THE SUBMERSIBLE DRY-MATE CONNECTOR. THESE SHOULD NOT BE EXCEEDED.

### 3.1 SUBMERSIBLE DRY-MATE SPECIFICATION

CHARACTERISTICS:	THESE CONNECTORS ARE INTENDED FOR GENERAL SUBSEA USE. THEY ARE DRY-MATE AND SUBMERSIBLE IN OPERATION.
PRESSURE RATING:	UP TO 8100 PSI - CONSULT ODI FOR ACTUAL RATING OF CONNECTOR SUPPLIED.
CURRENT RATING:	8 AMPS/CIRCUIT
ELECTRICAL INSULATION RESISTANCE:	10 GIGOHMS BETWEEN CIRCUITS AND TO SEAWATER @500 VDC
ELECTRICAL CONTACT RESISTANCE:	<0.2 $\Omega$ / PHYSICAL CONTACT, BUT CAN BE LESS THAN 0.01 $\Omega$ /PHYSICAL CONTACT - CONSULT ODI FOR ACTUAL RATING OF CONNECTOR.

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MAXIMUM VOLTAGE: 1000 VDC (MATED)

OPTICAL FIBER: 125/900 OR 125/250 MICRON SINGLE OR  
MULTI-MODE

TYPICAL OPTICAL LOSS:  $\leq 0.5$  dB PER PHYSICAL CONTACT  
 $\leq 0.1$  dB PER SPLICE

|| OPERATING TEMPERATURE -2 TO +50°C ||  
RATING:

MATING CYCLE LIFETIME:  $\geq 100$  MATE CYCLES

**NOTE: THE ABOVE REFER TO THE SUBMERSIBLE DRY-MATE  
CONNECTOR'S QUALIFIED CAPABILITIES AND NOT TO THE  
FACTORY ACCEPTANCE TESTS ACTUALLY CARRIED OUT ON THE  
DELIVERED CONNECTORS. REFER TO TEST PROCEDURE FOR  
DETAILS OF THE DELIVERED CONNECTOR'S TEST PARAMETERS.**

### 3.2 MAINTENANCE

SUBMERSIBLE DRY-MATE STYLE CONNECTORS REQUIRE NO PERIODIC  
MAINTENANCE AND ARE MAINTENANCE-FREE FOR THEIR INTENDED  
LIFE. IF DAMAGE OCCURS TO THE CONNECTOR, THEN THE ENTIRE  
CONNECTOR MUST BE RETURNED TO OCEAN DESIGN FOR REPAIR OR  
REPLACEMENT.