



## Product News from SEACON

### Ethernet Connector Developments

#### INTRODUCTION

SEA CON® has introduced a range of high integrity connector solutions for Cat5 and Cat5e applications.

These solutions utilize already established and widely used connector ranges that SEA CON® has been offering for many years, but now with the addition of new cables and specialized termination methods that enable their operation within Ethernet systems.



Ethernet Connector

Ethernet connectivity is highly dependent on cable selection. There are many cable manufacturers that are able to offer a wide range of relatively inexpensive Cat5 and Cat5e cable solutions for commercial land based applications and a few cable manufacturers are now beginning to provide cable solutions for the harsh subsea environment. As we move into these harsh subsea environments, the components and termination become more critical for the system to achieve success. SEA CON® has identified harsh environment Cat5 and Cat5e compliant cables for use with our connectors and are now working to develop a Cat6 cable.

#### EVALUATION

SEA CON® considered the needs of the subsea industry and identified candidates from its standard connector ranges that might be suitable for use on Ethernet systems. We then implemented a testing program to verify which connectors could be used to support the various Ethernet categories. The initial examination consisted of mating pairs of each connector range and testing against the requirements for the various Ethernet communications standards with a Validator NT955 high speed certifier. Following these tests, the cable/connector assemblies were subjected to pressure testing and certified under pressure.

The evaluation showed that there were a selection of connectors suitable for the various Ethernet categories:

**Cat5:** MINI-CON, WET-CON, Micro WET-CON, GLOBE-CON, HUMMER, CM2000, SEA-MATE

**Cat5e:** MINI-CON, WET-CON, Micro WET-CON, GLOBE-CON, HUMMER, CM2000, SEA-MATE

**Cat6:** HUMMER

In addition to this, the testing conducted also showed that the HUMMER connector was suitable for the higher level Cat6, although further testing is still underway.

#### TESTING

As with all connector/cable configurations, the environment in which the assemblies are used has an effect on their operation and this is nowhere more important than with Ethernet



Ethernet Connectors

communications. SEA CON®'s testing has shown that once the correct connector is selected for the appropriate Ethernet requirement the connector does not change the Ethernet performance during changes in the environment (pressure/temperature). However, careful consideration is required in the selection of cable as this is affected by the harsh subsea environment.

This unique approach adopted by SEA CON® provides us with the capability to match customer requirement with both connector performance and cable selection. While SEA CON® has "Harsh Environment" cable available for the Cat5 and Cat5e applications suitable Cat6 cable is being tested and will be available shortly.

### IP68 and IPX8 Certification Awarded to SEACON (europe) Ltd



SEACON (europe) Ltd is pleased to advise that it's WET-CON connector series is now approved to IP Codes (Ingress Protection) 68 and X8. These two international standards classify the level of protection provided against the intrusion of dust and water in electrical enclosures.

In order to meet the requirements of the IP68 and IPX8 standards, sample connectors were sent to an independent testing house and subjected to various tests as per the agreed program including pressure testing to 101 bar for a 24 hour period. All test samples successfully passed and therefore conform to the following conditions:

- Dust tight - No ingress of dust, complete protection against contact with dust.
- Immersion beyond 1 meter - Suitable for continuous immersion in water, under conditions specified by SEACON (europe) Ltd.



# Sea and Land Technologies Pte. Ltd.

## Connector Developments at SEA CON Global Production



MAW-2-HC Connector

Two new connector developments have recently taken place at SEA CON Global Production. The first of which is a 2 way rubber molded hermaphroditic connector which will be installed into a glove for use during a US Navy diving experiment.

The MAW-2-HC connector houses a customer supplied electronic control board and will be used to control heat temperatures. This small, neoprene connector can also be adapted for installing into other items of clothing that are required to provide heat.

A second development, also for a US Naval

application, is a short bodied, double ended penetrator utilizing a high speed data transmission cable (CAT5e). Two main requirements were that the penetrator had to be small enough to operate in a very tight space and at a depth of up to 1,700 metres of seawater. SEA CON Global Production successfully manufactured and delivered the penetrator assembly which achieved a network data transmission of up to 1Gbps.

## New 75 Ohm Coax Connector

Developed in conjunction with a camera manufacturer where a new HD camera required impedance matched coax and signal lines.

This new connector is based around SEA-CON®'s MINL-CCP shell size with the bulkhead having a combination of the MINL front end interface but with a SEA-CON 5515 FCR mounting interface. The insert is manufactured from molded PEEK (Polyetheretherketone) with a 316L Stainless Steel connector shell and has a pressure rating of 7,500 psi in a mated condition. This new 75 ohm coax connector is also available with the bulkhead having the standard MINL-FCR mounting interface.

## New Glass Sealed and High Power SEA-MATE Connectors

SEA-CON (europe) Ltd has developed a glass sealed version of its popular SEA-MATE underwater electrical wet-mate connector range.



Glass Sealed SEA-MATE Connector

Specifically produced for a customer for use on subsea and down hole monitoring equipment, the connector insert was designed using Finite Element Analysis (FEA) which simulated the effect of pressure against the insert and also determined the material and thickness required in order for it to operate within a high pressure and temperature environment. This glass sealed connector insert was manufactured using Inconel and has a pressure rating of 23,000 psi, however further testing is currently being conducted by the customer.

In addition, SEA-CON (europe) Ltd is also now able to offer a high power SEA-MATE connector. Utilizing our standard SML shell size with 4 off 8 AWG contacts molded in GRE (Glass Reinforced Epoxy) with a Hypalon face, the insert is rated to 1000v @ 50 amps with a pressure rating of 7,500 psi.

These latest two product developments show SEA-CON (europe)'s ability to modify existing standard connector ranges to suit specific applications.