Hyper-K Cable Potting

Instruction Manual

Tapendra BC, Dec 2025

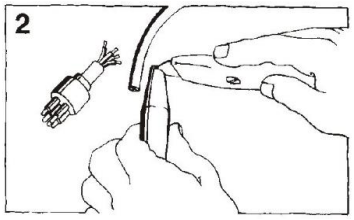
Review the Safety Data Sheets (SDS) for 3M™ 2131 Part A, Part B, and the primer before beginning the potting process.

Materials Used:

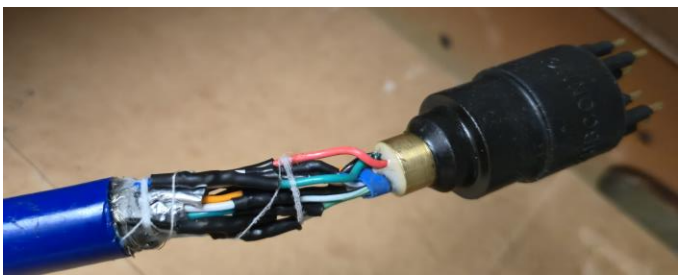
1. Hydro group's cables
2. Weicon Primer P 400
3. 3M Scotchcast Flame-retardant compound 2131
4. MacArtney connector and boot
5. Acetone for degreasing.
6. 60 ml Luer lock syringe
7. 1/8" ID , 3/16 OD vinyl tube
8. Aluminum tape
9. Custom made potting fixture

Fig: Potting fixture

Cable Preparation:



1. Trim the tapered cable entry on the boot until the cable fits snugly (approximately 0.5 mm smaller than the cable diameter).
2. Insert a piece of aluminum tape between the boot and the cable to reduce friction and allow the boot to slide easily. Place the metal side of the tape against the cable.
3. Cut the pigtail wires on the OM connector to approximately 2 cm from the brass body.
4. Prepare the cable by stripping 3 cm of the outer jacket. Solder the cable conductors to the OM connector pigtail wires and insulate the joints using heat-shrink tubing.



5. Wrap a thread around the wires to hold them together during the potting process.
6. Degrease all moulding surfaces—including the cable jacket, conductors, and brass body—using acetone and allow them to dry. Apply the weicon primer to the brass body, conductors, cable jacket, and neoprene base of the connector using a small brush. Allow the primer to dry for approximately 30 minutes at 20 °C. Do not touch primed surfaces after application.

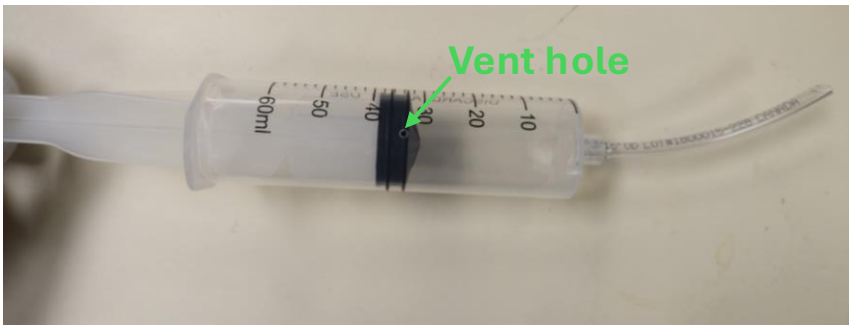
Resin Applicator Preparation:

According to the datasheet for 3M™ Scotchcast™ Flame-Retardant Compound 2131, the specified gel time is 17 minutes; however, in practice, the effective working time is less than 10 minutes. This means the compound remains in a liquid, flowable state for under 10 minutes, requiring the boots to be filled promptly.

Due to the bulkiness of the cables and the minimal clearance between the cable and the boot, it is not practical to fill more than one boot by pouring directly from the bag, as suggested in MacArtney's FSK instructions. Instead, a syringe with vinyl tubing was used to inject the compound into the boots before the material began to gel.

Prepare the syringe:

1. Cut a vinyl tube to a length of 8 cm and press it onto the Luer-lock tip of the syringe. Friction will hold the tubing in place.
2. Drill a 9/64 in. hole in the syringe barrel to allow air to vent.



Resin Preparation:

1. Follow the mixing steps printed on the back of the 3M™ 2131 packaging. Ensure that Steps 2 and 5 are performed as specified; failure to do so may result in uncured resin spots due to incomplete mixing.

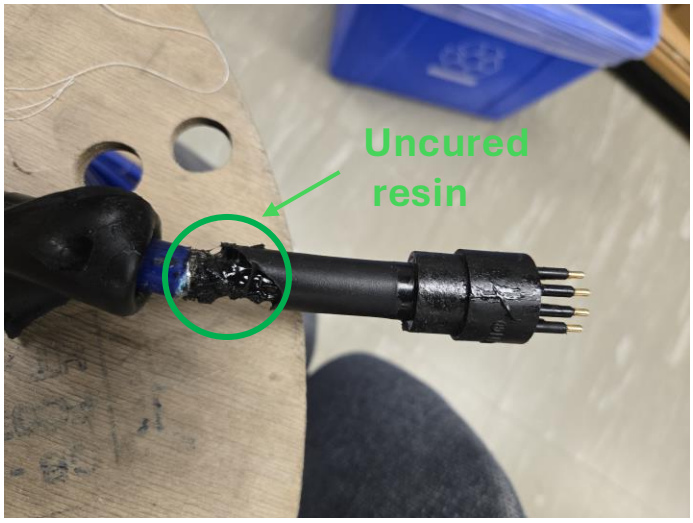


Fig 1: Showing uncured resin

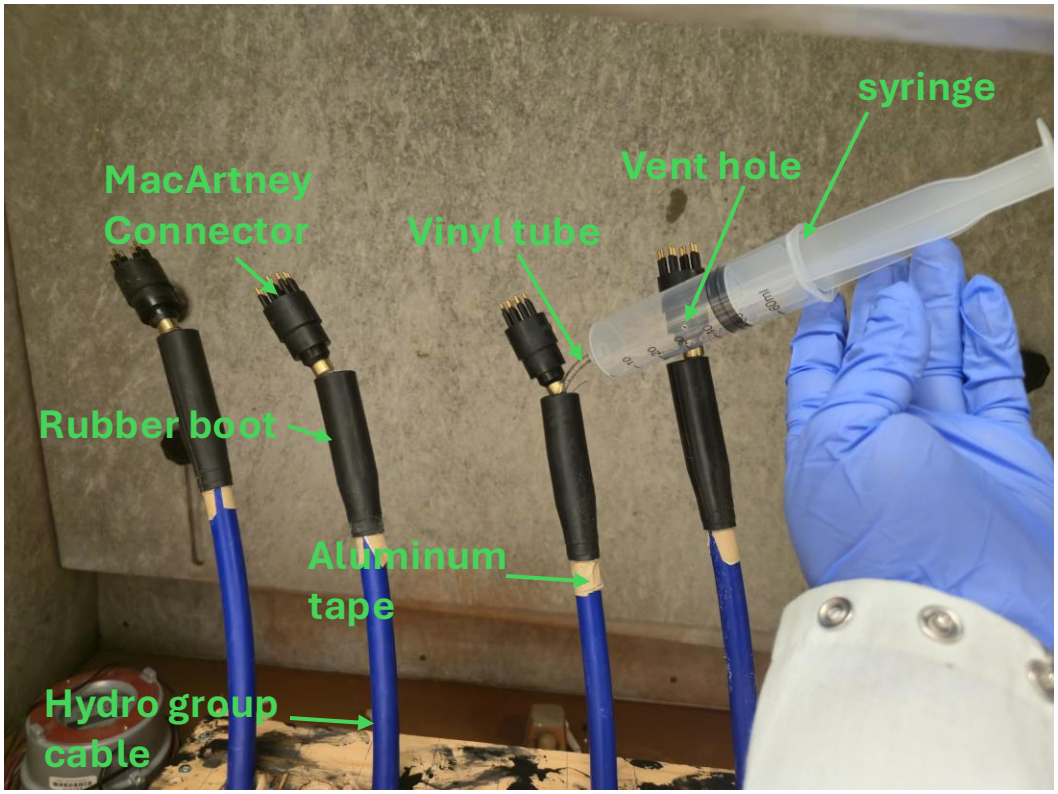


Fig 2: Demonstrating potting. The syringe is not filled with the compound in this picture, but it should be.

1. Remove the syringe plunger and pour the mixed resin into the syringe up to the drilled vent hole.
2. Reinsert the plunger and slowly push it up to the vent hole to expel air. Continue pushing past the hole until resin no longer leaks from the vent and begins to flow from the vinyl tube.
3. Insert the vinyl tube into the boot, as shown in the figure, and fill the boot with resin. Up to four boots can be filled in one go .
4. Allow the resin to settle before topping off the boot and closing it.
5. Remove the aluminum tape, then allow the resin to cure for 24 hours.

References :

1. MacArtney FSK kit instruction, https://www.macartney.com/connectivity/subconn/subconn-additional-accessories/fsk-kit/
2. 3M 2131 datasheet, https://multimedia.3m.com/mws/media/719642O/microsoft-word-78-8129-9502-1-rev-d-docx.pdf

Appendix

OM Assembly Procedure

The Subconn®OM series of connectors is supplied as a quick, reliable and watertight solution for customers who require installation of standard Subconn® connectors on a non-standard cable or for quick, efficient field retermination.

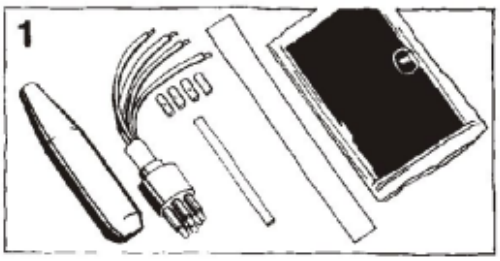
The OM connector series mates with the compatible standard Subconn® series. The connectors are produced with a tube brass body and 7 cm pigtail wires which are spliced and moulded to the cable using a pre-formed "Boot" and pre-packed ambient temperature curing polyurethane.

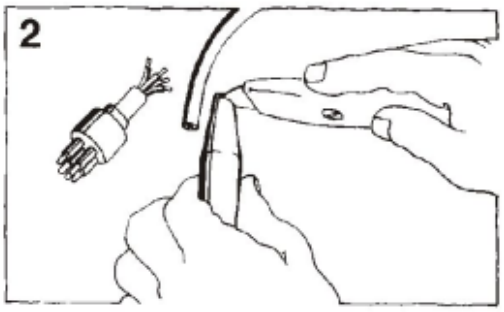
The end result is a professional, rugged and watertight termination rated to full ocean depth. The connector is available in 2 to 16 pin male and female configurations together with all the specials with the same shell size.

Operational Steps

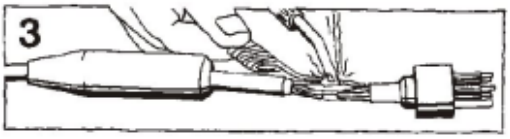
1. Ensure that the correct materials are available for the planned job.

- The correct OM connector (e.g. OM6F)
- The correct "Boot" (e.g. OMBB)
- Adequate moulding material (e.g. 2140U 90 g)
- Primers (5136 PUR/776 Metal)
- Acetone for degreasing
- Crimp Sleeve and heating gun
- Soldering iron, solder, side cutters, cable stripper and a small paint brush



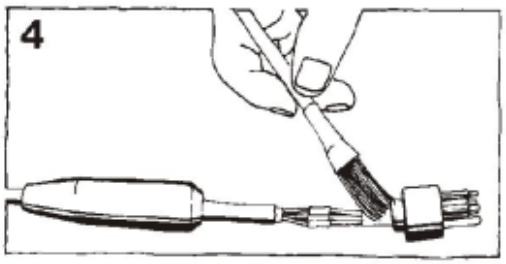


2. Cut pigtail wires on OM connector to approx. 2 cm from brass body. Trim back tapered cable entry on boot until the cable is a snug fit (approx. 0.5 mm less than cable diameter).



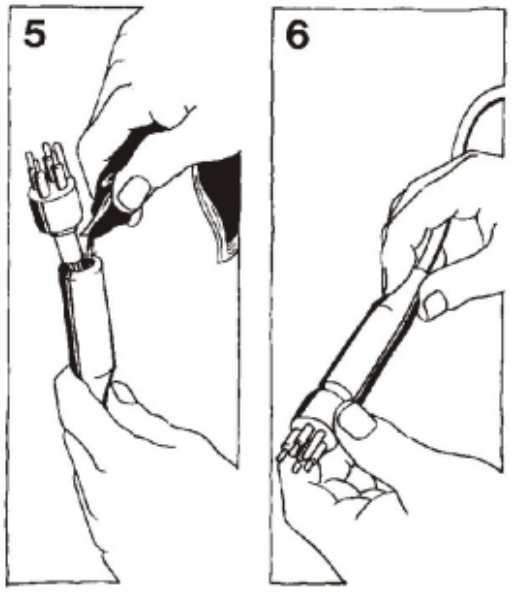
3. Prepare cable to be connected by stripping 3 cm off the jacket. Solder or crimp cable wires to pigtail on OM connector and insulate using crimp sleeve or electrical tape. Twist spliced conductors together in same direction as lay in cable.

4. Degrease all moulding surfaces including cable jacket, conductors and brass body with acetone and allow to dry. Apply appropriate primer to brass body conductors, cable jacket and neoprene base of connector with a small brush and allow to dry (approx. 30 min. at 20° C). Do not touch primed surfaces after primer application.



5. Select the appropriate polyurethane twin pack (2140U 90 g for a single moulding or 2140U - 210 g for 2 or 3 pre-prepared mouldings).

Squeeze the twin pack until the inner membrane ruptures and the two components can be mixed. Work the pack vigorously by hand for about 30 seconds to ensure thorough mixing. Cut off the corner of the pack and squeeze the material into the boot as shown.



6. When the boot is full of material slide it up the cable until it fits tightly over the neoprene protrusion on the back of the connector. Push the cable into the boot about 2 mm and wipe off any excess visible polyurethane material. The connector will be ready for use after 12 hours at 20° C.