

Fusion Splicing

Fusion splicing involves the melting and jointing of optical fibres using heat generated by an electric arc between electrodes.



Fusion splicing is performed by a fusion splicer, a machine used to weld (fuse) two optical fibres together. The fibre ends are prepared, cleaved, and placed in alignment fixtures on the fusion splicer. At the press of a button, the fibre ends are heated with electrodes, brought together, and fused. We can preset the splicing parameters or choose factory recommended settings that will control the splicing process itself. Each manufacturer's product is slightly different and requires somewhat different procedures.

1) Preparation of cable for jointing

A minimum of 10 meter of cable at each end is coiled in the jointing pit. A pit length of 1 meter is sufficient for most of the cable and joint closures. Details of cable pit are given in Drawing No.RDSO/TCDO/COP-21.

The distance from the last centre to the end of the cable must be at least 1.8 meters. This is the minimum length to be stripped for preparation of joint.

2) Stripping/Cutting of the Cable

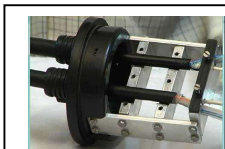


The cable is stripped of outer and inner sheath with each sheath staggered approximately 10mm from the one above it.



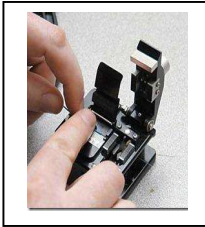
Proper care must be taken when removing the inner sheath to ensure that the fibres are not scratched or cut with the stripping knife or tool. The fibres shall be then removed from cable one by one and each fibre is cleaned individually using kerosene oil to remove the jelly.

3) Preparation of Cable Joint Closure for Splicing



The strength member of each cable shall be joined to each other and/or the central frame of the joint closure. The sealing compound or heat shrink sleeve shall be applied to the cables and closure. Tags which identify the fibres number shall be attached on the fibres. Splice protectors shall be slipped over each fibre in readiness for placing over the bare fibre after splicing.

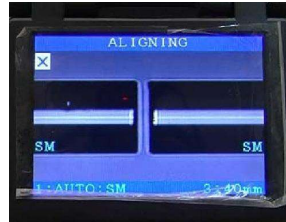
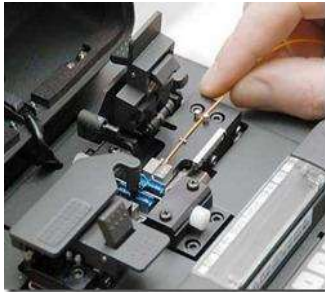
4) Stripping and Cleaving of Fibre



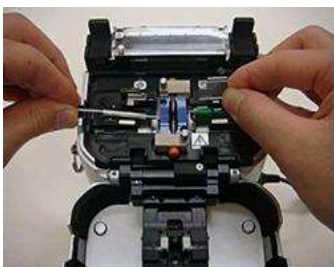
Prior to splicing, primary protective coating of each fibre shall be stripped off up to length of 50 mm. by using fibre stripper. The bare fibre shall be then wiped with a lint tissue paper rinsed with ethyl alcohol. Cleaving of the fibre shall then be performed to obtain as close as possible to a perfect 90 degree face on the fibre.

5) Fusion splicing of fibre

- (a) Hands shall be thoroughly washed prior to commencing this procedure.
- (b) The clean bare fibre shall be dipped in the beaker of ethyl alcohol of the ultrasonic cleaver and ultrasonic cleaver switched on for 5-10 seconds.
- (c) The bare fibre shall then be placed inside 'V' groove of the splicing machine by opening clamp handle, in such a way so that 1 mm gap is available between the electrodes and the end of fibre being spliced and heat shrink protector inserted.

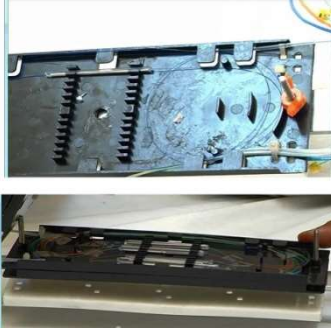


- (d) The same procedure shall be repeated for other fibre.
- (e) The start button on the splice controller shall be pressed.
- (f) The machine shall pre-fuse set align both in 'X' and 'Y' direction and then finally fuse the fibre.
- (g) The splice shall be inspected on monitor provide on the fusion splicing machine, there shall be no nicking, bulging and cores are adequately aligned. The Splice loss should be within 0.02dB. The above procedure shall be repeated if the splice is not visually good looking.
- (h) The heat shrink protector shall be slid over the splice and tube shall be placed in tube heater. Heating shall be considered complete when soft inner layer is seen to be 'oozing' out of the outer layer of the protector.



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- (i) The steps a) to (h) above shall be repeated for other fibres.

6)Organising fibre and finishing joints



- (a) After each fibre has been spliced, the heat shrink protection sleeve shall be slipped over the bare fibre before any handling of fibre takes place as uncoated fibres are very brittle and cannot withstand small radius bends without breaking.
- (b) The fibre shall then be organized into its tray by coiling the fibres on east side of the protection sleeve using the full tray side to ensure the maximum radius possible for fibre coils.
- (c) The tray then shall be placed in the position.

7)Placing of completed joint in pit

The cable is laid on the ground and looped according to the marking done in the beginning. These loops shall then be tied together with the tape. The joint shall be permanently closed and sealed by heating heat shrinkable sleeve, etc. The joint closure shall be fixed to the bracket on the pit wall and pit closed.