



A Furukawa Company

## Fusion Splicing Recommendations for TeraWave™ ULL Fiber

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### 1. General Fusion Splice Machine Settings

This document provides the recommended fusion splice machine settings for use with OFS TeraWave™ ULL fiber.

**1.1** Set the fusion splicer for single mode fiber splicing.

**1.2** When splicing TeraWave ULL fiber to TeraWave ULL fiber:

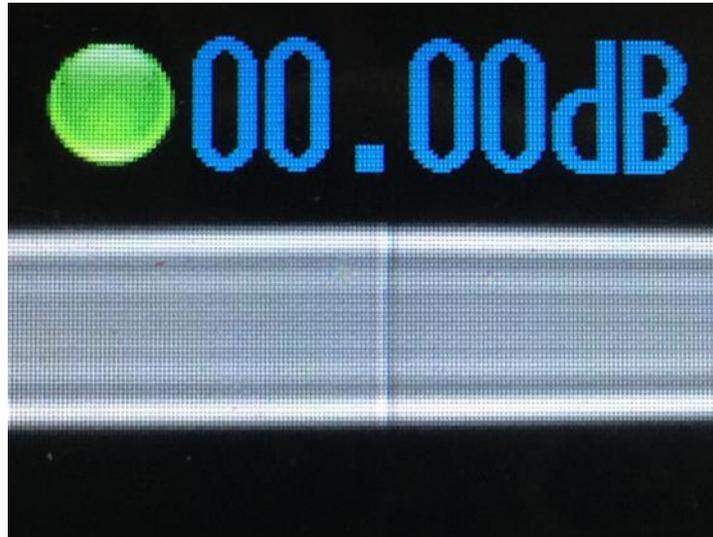
- i) Set the alignment mode to clad alignment.
- ii) Set the arc conditions as follows.
  - Arc power stays the same.
  - Set the arc discharge duration to 2 times the current SM value.

**1.3** Splicing Terawave ULL fiber to standard SM fiber:

- i) Set the alignment mode to clad alignment.
- ii) Set the arc conditions as follows.
  - Set the arc power to 85 - 90% of the current SM arc power.
  - Set the arc discharge duration to 15 times the current SM value.

**1.4** Note that a faint vertical line may appear between the two fibers on the video display of the fusion splice machine (see Figure 1). This line will not affect the quality of the fiber splice.

**1.5** See Section 3 for information regarding fusion splice testing for TeraWave ULL to standard single mode fiber.



**Figure 1 – The vertical line shown on the display of fusion splice machine will not affect the quality of the fiber splice.**

## **2. Fitel S178 Fusion Splice Machines**

The following splice recipes can be uploaded to Fitel S178 fusion splice machines via Fitel SmartFuse® fusion splicer software.

- i) TeraWave ULL fiber to TeraWave ULL fiber
- ii) TeraWave ULL fiber to Standard SM fiber

The SmartFuse software can be downloaded from the following FTP site:

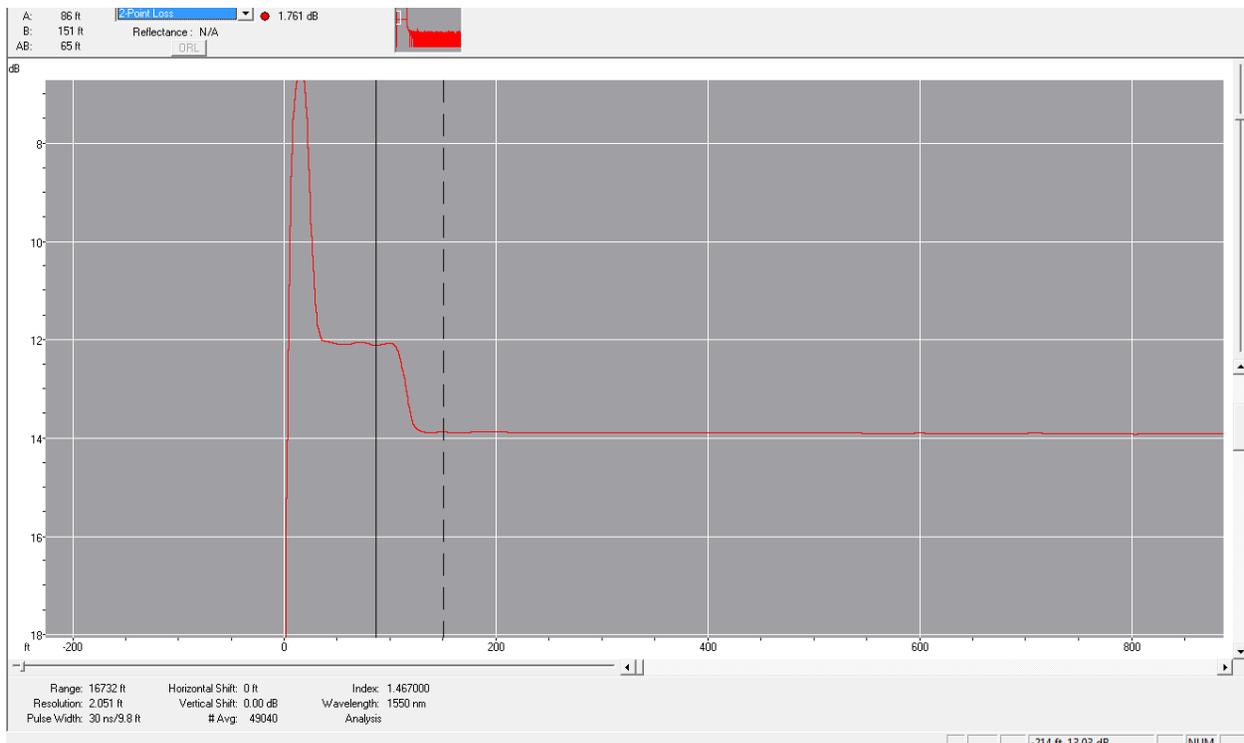
- Address: <ftp://207.230.94.79>
- User name: ofsdownload
- Password: d0wnOFSnew

Please contact OFS Fitel for further information regarding the SmartFuse Fusion Splicer software.

### 3. OTDR Testing of Fusion Splices between TeraWave ULL and Standard Single Mode Fiber

TeraWave ULL fibers have a nominal mode field diameter (MFD) of 12.4  $\mu\text{m}$  whereas standard single mode fiber has an MFD of 10.4  $\mu\text{m}$ . Because of the large difference in MFD between TeraWave ULL and standard single mode fiber, OTDR measurement error will be seen when the two fibers are spliced together, e.g., when a single mode pigtail is spliced to a TeraWave ULL fiber on a termination shelf. The actual splice loss is determined from the average of bi-directional OTDR measurements of the splice loss.

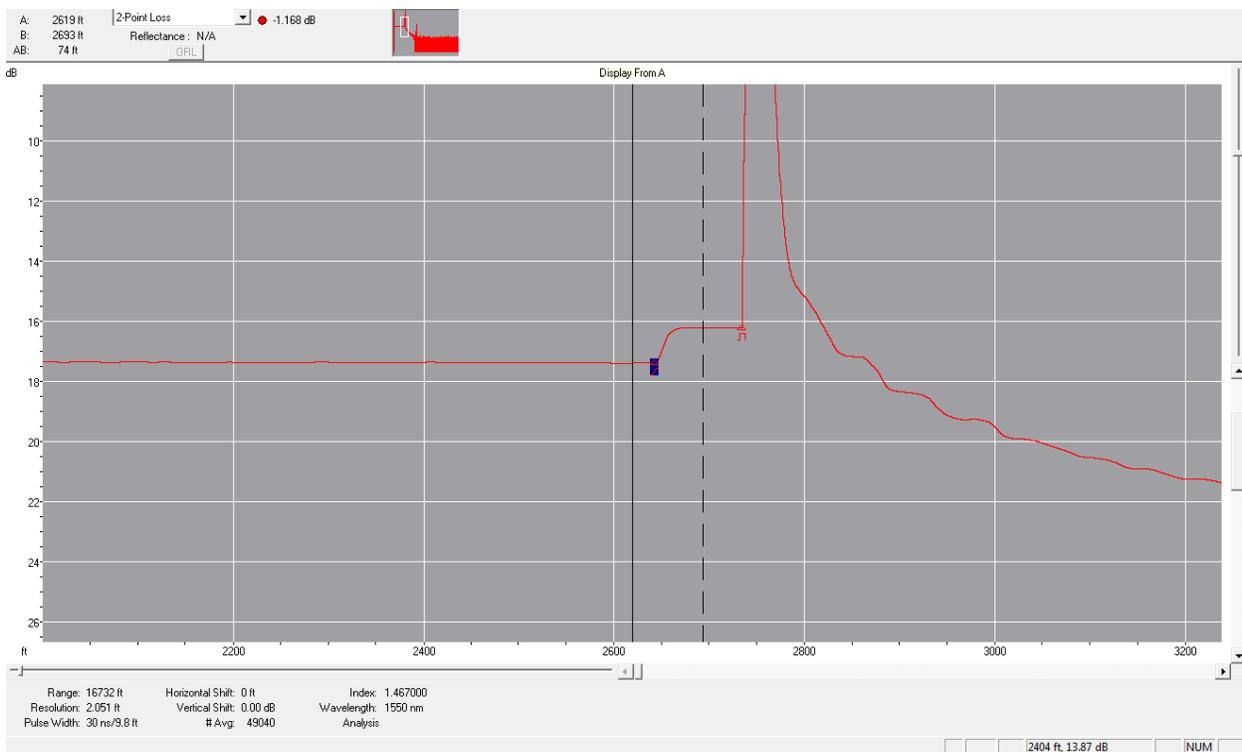
For example, if the OTDR signal is launched into a standard single mode pigtail, and the pigtail is spliced to a TeraWave ULL fiber, the OTDR will display an exaggerated splice loss as shown in Figure 2. Note in this example that the reported splice loss = 1.761 dB.



**Figure 2 – OTDR trace of a fusion splice (direction A) between standard single mode and TeraWave ULL fiber. In this example, the single mode fiber pigtail is connected to the OTDR. Note the exaggerated splice loss.**

When measured from the opposite direction (direction B) the OTDR displays a negative loss, or “splice gain” of -1.168 dB as shown in Figure 3. The actual splice loss is determined from the average of the two measurements (bi-directional average) as shown below.

$$\text{Actual splice loss} = [1.761 \text{ dB} + (-1.168 \text{ dB})] / 2 = 0.297 \text{ dB}$$



**Figure 3 – OTDR trace of a fusion splice (direction B) of TeraWave ULL and standard single mode fiber. In this example, the single mode fiber pigtail is spliced at the end of the TeraWave ULL fiber. Note the negative loss or “splice loss gain”.**



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***For additional information please contact your sales representative. You can also visit our website at [www.ofsoptics.com](http://www.ofsoptics.com) or call 1-888-FIBER-HELP (1-888-342-3743) from inside the USA or 1-770-798-5555 from outside the USA.***

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