



NORLAND PRODUCTS

[UV Adhesives](#)

[Fiber Optics](#)

[Fish Gelatin](#)

[Distributors](#)

[About Norland](#)

[Trade Shows](#)

[Employment Opportunities](#)

[Links](#)

Fiber Optic Splice System



Norland Products Inc., the leading manufacturer of ultraviolet curing optical adhesives, has developed a complete fiber optic splicing system that provides a fast, easy method for making permanent, high performance connections. This system utilizes the exclusive Norland UVC Optical Splice and UV curing Norland Optical Adhesive. Together they form a superior system that is unmatched in simplicity and performance. The components of the system are described in this bulletin.

Norland UVC Optical Splice

The Norland UVC Optical Splice is the first **really** easy to use, high performance connection for optical fibers. This splice incorporates a precision TRW glass alignment guide and a proactive glass sleeve in a unique one piece design that minimizes handling of bare fiber. Everything has been carefully engineered into this compact 1.5" glass tube. Just fill with Norland Optical Adhesive, insert fibers and cure for a sturdy, ready to handle splice in minutes. The wide mouth entrance of the splice makes it easy to insert fibers. This versatile design feature also allows the one splice to accommodate all types of fiber with any size buffer coating up to 1mm. in diameter. The fibers easily slide into the central glass guide and automatically align with pinpoint accuracy. The all glass construction provides the perfect thermal match for optical fibers and assures long stability over a wide range of temperatures.

Suggested uses for the splice include extending a link, repairing a break, testing in the lab or attaching pigtailed devices into a system.

SPECIFICATIONS

Dimensions	1.40" x 0.15" dia.
Materials of construction	
Alignment guide	borosilicate glass
Protective sleeve	borosilicate glass
Tapered channel	Kynar*

Fiber size	
P/N 20125	Accepts 125 to 140 micron fibers.
P/N 20126	Used for preinstalling pigtails. Accepts 125 to 140 micron fibers
All sizes are suitable for single mode or multimode and will accept all types of protective buffer up to 1mm diameter.	
Light loss	0.20 dB Average
Temperature range	-40° to 70°C
Pull strength	6 Newtons Average
Assembly time	4 to 6 minutes
Tools required	Fiber Stripping Apparatus Fiber Cleaving Tool UVC Splice Holder UVC Splice Lamp or Norland Opticure Light Gun Norland Optical Adhesive Microscope or Magnifier

**T.M. Penwalt*

[Norland Optical Adhesive](#)

P/N 6106 - NOA 61 in 6cc Syringe

P/N 8106 - NOA 81 in 6cc Syringe

The key to the simplicity and performance of the splicing system is that Norland Optical Adhesive is used throughout the splice. The adhesive forms a permanent, index matching bond between fiber faces and at the same time encapsulates the entire fiber, including buffer, for immediate protection and strength.

Norland Optical Adhesive (NOA) is a crystal clear, single component adhesive with a long shelf life, yet cures in minutes when exposed to ultraviolet light to form a tough, strong physical and optical bond. Two types are available, and both are supplied in 6cc syringes which fill approximately 25 splices.

[NOA 61](#): Recommended for single mode fibers and where the lowest light loss is desired.

[NOA 81](#): Faster curing. Recommended where speed or extra strength is desired.

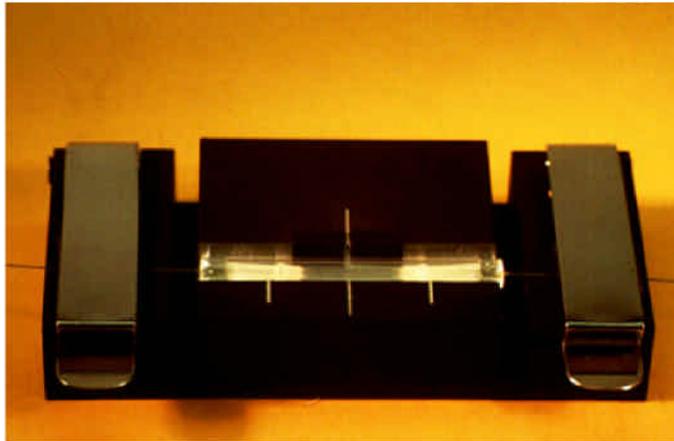
[Index Matching Liquid](#)

P/N 9006

The Index Matching Liquid IML 150 is substituted for Norland Optical Adhesive when using the Norland Splice for temporary connections. This low viscosity index matching liquid will not cure and allows you to insert fibers into our splice over and over again.

UVC Splice Holder

P/N 21005



The Norland UVC Splice Holder is a compact, precision machined fixture that holds the splice and fibers for optimum alignment and cure. The splice holder is made of anodized aluminum with stainless steel clips and is 13/8" x 3" x 5/8" in size.

Fiber Cleaving Tool

P/N 21311

The Norland Fiber Cleaving Tool is a precision stapler-type cleaver which uses a ceramic blade to nick the optical fiber. The fiber is then bent causing it to break cleanly giving a square cut to the fiber end.

The Norland Fiber Cleaving Tool is a sturdy unit for use in both laboratory and field service work. This cleaving tool typically gives 98% of the cleaves within a cutting angle of less than 2. The ceramic blade gives hundreds of excellent cleaves.

Fiber Tools

P/N 22550

The Norland Super Shears are the choice tool for cutting kevlar. These low cost shears never need sharpening because they are made of chromium steel alloy. Their rounded tips, flat blades and safety clip lock make them safer than conventional cutting tools.

UVC Mini Lamp

P/N 5300

The UVC Mini Lamp is a portable, battery operated, ultraviolet lamp designed to cure the Norland UVC Optical Splice. After the splice has been assembled, the Mini Lamp can be easily moved to fit over the SpliceMate or the Splice Holder. The dimensions of the Mini Lamp are 6.5" x 2.25" x 3.75" and weighs 8 oz. The Mini Lamp works with an AC adapter or with 4 AA batteries. The average bulb intensity is 2,000 $\mu\text{W}/\text{sq. cm}$ which will cure the splice in 6 minutes.

Opticure 4 Light Gun with Timer

P/N 5080T

The Opticure 4 Light Gun provides a faster method for curing the adhesive in the splice. This small, hand-held light source provides a high intensity beam with over 50 mW/cm^2 of long wave, ultraviolet light in a safe, easy to control form. Using the light gun and the Splice Holder, the splice can be cured by exposing the center and each end for a period of 30 seconds each. The Opticure 4 Light Gun comes standard as a 117V unit.

UVC Splice Lamp

P/N 5200 - 117V Model

The UVC Splice Lamp is a table top lamp designed specifically for curing the UVC Optical Splice. It is a 4 Watt, high intensity fluorescent black light on a sturdy hinged stand. The convenient hinged stand allows the light to be raised out of the way during splice assembly and then lowered into place for the cure. The light provides 2500 $\mu\text{W}/\text{sq. cm}$ of UV light at 1.5" and allows hands free curing of the splice in 3 to 5 minutes. The splice holder can be mounted permanently to the base as shown to make a complete all in one unit.

Splice Organizer Chip

P/N 21020

The Splice Organizer Chip is designed to hold up to 12 completed Norland UVC Optical Splices. This molded plastic chip has a pressure sensitive backing that can convert any standard splice tray to fit Norland splices. The splice chip is ideal for laboratory use or for holding splices inside instruments. For fewer splices, the splice chip can be cut into smaller sizes.

Datacom Splice Enclosures

P/N 21300 and 21310

The Norland Datacom Splice Enclosure is designed for the maximum protection of up to 6 fiber optic splices. A larger enclosure is also available for up to 18 splices. Both of these compact units do not require splice trays because the splices attach to the inside wall of the enclosure. They are ideal for dropping fibers, repairing broken cables or extending cable links.

Norland Splice Tray

P/N 21290

The Norland Splice Tray is an anodized aluminum tray with a Splice Organizer Chip to hold up to 12 Norland Splices. The size of the tray is 12" x 4" x 1/4" thick and fits into standard enclosures with a threaded center post. A clear plastic cover clips onto the top of the tray to protect fibers and splices. Trays in other sizes are available on request.

Simplex Cable Crimp Splice Housing

P/N 20910

This slim stainless steel housing has been designed to protect the splice and provide full cable strength when using simplex or duplex type cables. Cable strength is achieved by crimping the kevlar strength member fibers between an inner metal collet and an outer central housing. Shrink tubing is added to the ends to provide a water tight seal and bend relief. The length is 4 1/2 inches and the diameter is 1/4 inch. This housing requires a hexagonal crimp tool with a 0.213" die and a heat gun for assembly.

Fiber Visualizer

P/N 25000

The Fiber Visualizer is a unique instrument which simplifies installing and testing of fiber optic networks. This compact unit uses a 0.5mW helium neon laser, with an ultra-precision optical adaptor to focus visible light into the core of a fiber optic connector. As the light travels down the fiber, a red glow appears anywhere there is light loss in the system. The Visualizer comes complete with a 12V AC adapter in a rugged carrying case with the connector adapter of your choice.

Cleave-Chek Interferometer System

P/N 25110

The Norland Cleave-Chek Interferometer System is a fast and easy way to inspect a cleaved optical fiber. This unit combines a fiber interferometer with a CCTV camera and a 9 inch video monitor. By projecting the fiber face onto the monitor, the user is able to calculate the exact end angle and view the topography of the fiber face. This system can be used for inspecting fiber cleaves, evaluating the performance of cleaving tools and as a training aid for improving cleaving techniques. (Interferometer is also available without camera and monitor).

30X Illuminated Microscope

P/N 21400

The Norland 30X Illuminated Microscope is a battery operated light scope which allows the operator to inspect the fibers for accuracy of the cleave and cleanliness of the stripped fibers. This instrument provides the optimum combination of magnification and depth of field to observe the entire fiber edge easily.

NORLAND SPLICE KITS

Norland Products has several splice kits available for making high performance fiber optic splices immediately. They are ideal for manufacturing, laboratory or field splicing.

Fiber Acceptance Test Kit

P/N 23005

The Norland Fiber Acceptance Test Kit combines a one meter pigtail with a UVC Splice Holder, 2 syringes of Index Matching Liquid and 10 UVC Optical Splices to attach bare fibers to test equipment. Within seconds, a fiber acceptance reading can be made with any OTDR or test meter. Such applications as cable acceptance testing and fiber continuity testing are done quickly and easily with this kit.

Laboratory Splice Kit

P/N 23010



The Norland Laboratory Splice Kit is designed for making temporary fiber optic connections in the lab or in the field. This low cost kit contains 10 Norland UVC Optical Splices, 3 SpliceMate Splice Holders, and 1 syringe each of Norland Optical Adhesive 61 and Index Matching Liquid.

This kit is suitable for splicing all single mode or multimode fibers in the 125 to 140 micron range. The Index Matching Liquid is ideal when making a temporary connection for testing purposes. If more permanent connections are desired, the UV curing Norland Optical Adhesive 61 can be used to bond the fibers into place.

Basic Splice Kit

P/N 23000

The Basic Splice Kit is for anyone who already has all the tools required for fiber preparation and for curing optical adhesive. This kit includes 10 UVC Optical Splices, 2 syringes of Norland Optical Adhesive and 1 UVC Splice Holder.

NSK-2 Kit

P/N 23020

The NSK-2 Kit consists of 10 UVC Splices, 2 syringes of Norland Optical Adhesive, 1 UVC Splice Holder, and 1 UVC Splice Lamp. This is ideal for anyone who has the tools for fiber preparation but needs a light source for curing the adhesive.

Fusion Splice Protector Kit

P/N 30000

This easy to use method for protecting a fusion splice is suitable for fibers with any size buffer up to 900 microns. The user simply slides the thick wall glass protector sleeve over the spliced area. UV adhesive is then injected into this sleeve through an adapter cap. Curing the adhesive with UV light forms an expansion matching glass splint over the spliced area. The kit contains 200 Pyrex protector sleeves, a bottle of fast curing NOA adhesive, two splice sleeve fillers, and a no stick work surface.

NSK-4 Kit

P/N 23040

The NSK-4 Kit consists of 10 UVC Optical Splices, 2 syringes of Norland Optical Adhesive, 1 UVC Splice Holder, and a UVC Mini Lamp. This is one of our most versatile kits because the Mini Lamp operates off of either AC or DC power. This makes the kit extremely portable for work in the field or in the laboratory.

Splice Training Video

P/N 24010

The Norland Splice Training Video is a 12 minute VHS tape designed to teach how to make a Norland UVC Optical Splice. Detailed explanations on the principles of our design and how to optimize the splice for low light loss enables anyone to make a high performance fiber optic connection in minutes.

[NSK-8 Kit](#)

P/N 23080

The NSK-8 Splice Kit includes everything necessary to splice together fiber optic cables. This includes the fiber preparation tools, a fiber cleaving tool, splices, and a UV light source, all in a sturdy carrying case..

NSK-12 Kit

P/N 23120



The NSK-12 is a complete tool kit designed for installing and maintaining a fiber optic network. This kit includes the Norland Fiber Visualizer with all the fiber preparation and splicing tools necessary to make a mechanical splice.

KIT INCLUDES:

2	Syringes Norland Optical Adhesive
1	30X Microscope
1	X-Acto Knife
2	Cable Jacket Stripper
2	Buffer Strippers
1	Tweezer
1	Norland Super Shears
1	Roll Tape
10	Texwipe Cleaning Pads
1	Plastic Bottle for Solvent

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