

NORLAND

Norland UV Curing Optical Adhesives

Norland Optical Adhesives are designed for fast, precision bonding applications and will simplify processes that require critical alignment or exact positioning.

Used to manufacture optical components and other products including:

- LEDs
 - Lenses
 - Prisms
 - Lasers
 - Fiber Optics
 - LCDs
 - TouchScreens
 - Solar Panels
 - OLEDs
 - Optoelectronic Devices
 - Endoscopes
 - Art Glass
 - Eye Glasses
 - Dive Masks
 - Glass Trophies
 - Windshield Crack Repair
 - Microscope Slide Mounts
- to name a few...



Norland Optical Adhesives

These one part adhesives will set in seconds when exposed to ultraviolet light and can provide excellent light transmission over a wide spectral range. Our Optical Adhesives are designed for bonding where low strain, optical clarity or low outgassing are required in military, aerospace, fiber optics or commercial optics.

Norland Adhesives provide:

- Fast cure
- Long shelf-life

- Strong bonds to glass, metal, ceramics and plastics
- Low shrinkage — low stress
- Gap filling properties

Typical applications include:

- Conformal Coating
- Encapsulating
- Fillet Bonding
- Fixturing
- Optical Replication
- Potting
- Sealing
- Strain Relief
- Temporary Bonding
- Crack Filling



T E C H N I C A L D A T A

Norland Optical Adhesive (NOA)

Type	Description	Cure	ADHESION TO:			Color	Viscosity at 25 Degrees C	TYPICAL PROPERTIES					
								REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 60	General purpose adhesive for bonding doublets, prisms or mounting components.	UV	Good	Good	Fair	Clear	300 CPS	1.52	1.56	135,000	2,800	35%	81
NOA 61	Preferred adhesive for military optics. Meets MIL-A-3920. Used for optics exposed to temperature extremes. Low shrinkage.	UV	Excellent	Excellent	Fair	Clear	300 CPS	1.52	1.56	150,000	3,000	38%	85
NOA 63	Cures well in thick sections. Use as fillet bond to hold lenses in place or for bonding where low fluorescence or good transmission in range	UV	Good	Good	Fair	Clear	2,500 CPS	1.52	1.56	240,000	5,000	6%	90
NOA 65	Flexible adhesive suitable for Low train applications or for cold blocking of lenses.	UV	Good	Good	Fair	Clear	900 - 1,000 CPS	1.49	1.52	20,000	1,500	80%	50
NOA 68	Flexible adhesive for glass or plastics such as polycarbonate, CAB or acrylic.	UV	Excellent	Good	Good to Excellent	Clear	5,000 CPS	1.51	1.54	20,000	2,500	80%	60
NOA 68 T	Screen printable flexible adhesive for glass and plastics such as polycarbonate, CAB and acrylic.	UV	Excellent	Excellent	Fair	Clear	20,000-25,000 CPS	1.51	1.54	12,400	714	59%	50
NOA 68 TH	UV cured and/ or heat cured @ 80°C high viscosity, flexible optical adhesive for glass or plastics such as polycarbonate CAB or acrylic	UV/Heat	Excellent	Good	Good to Excellent	Clear	20,000-25,000 CPS	1.51	1.54	12,400	714	59%	50
NOA 68 THA	UV cured and/or heat cured @ 60°C high viscosity, flexible optical adhesive for glass or plastics such as polycarbonate CAB or acrylic	UV/Heat	Excellent	Good	Good to Excellent	Clear	20,000-25,000 CPS	1.51	1.54	12,400	714	59%	50
NOA 71	Provides a strong bond to glass surfaces and has excellent clarity for light guides and other applications.	UV	Excellent	Excellent	Fair	Clear	200 CPS	1.52	1.56	55,000	1,300	43%	86
NOA 72	Low viscosity adhesive for bonding glass or plastics such as polycarbonate, CAB or acrylic. Cures with UV or visible light.	UV/VIS	Excellent	Good	Good to Excellent	Clear	155 CPS	1.52	1.56	2,400	500	34%	75
NOA 73	Flexible adhesive with low viscosity for bonding delicate parts.	UV	Excellent	Good	Fair	Clear	130 CPS	1.52	1.56	1,600	200	16%	60
NOA 74	Low viscosity UV curing adhesive recommended for bonding glass and plastics. This adhesive has excellent adhesion to CAB.	UV	Excellent	Good	Good to Excellent	Clear	80-95 CPS	1.49	1.52	2,900	217	10%	30

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								REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 74H	Low viscosity UV and/or heat cured @ 80°C recommended for bonding glass and plastics. Has excellent adhesion to CAB.	UV/Heat	Excellent	Good	Good to Excellent	Clear	80–95 CPS	1.49	1.52	2,900	217	30%	30
NOA 75	Low viscosity UV and visible light curing adhesive recommended for bonding glass to plastic and plastic to plastic.	UV/VIS	Excellent	Good	Good to Excellent	Slight Yellow Tint	80–95 CPS	1.49	1.52	2610	164	7%	25
NOA 76	High viscosity adhesive for bonding glass to plastic. Cures with UV or visible light.	UV/VIS	Excellent	Good	Excellent	Clear	3,500 – 5,500 CPS	1.49	1.51	970	450	47%	60
NOA 78	High viscosity adhesive for bonding plastic to plastic. Cures with UV or visible light.	UV/VIS	Excellent	Good	Excellent	Yellow Tint	8,000 – 11,000 CPS	1.50	1.52	1,140	649	57%	55
NOA 81	Fast curing adhesive for tacking or bonding. Excellent adhesion to glass or metal. Produces a hard, resilient bond.	UV	Excellent	Excellent	Fair	Clear	300 CPS	1.52	1.56	200,000	3,000	25%	90
NOA 83H	Fast curing adhesive that will cure with UV or heat @ 80°C for tacking or bonding UV opaque materials.	UV/Heat	Excellent	Excellent	Fair	Clear	250 CPS	1.52	1.56	160,000	3,500	30%	85
NOA 83HA	Fast curing adhesive that will cure with UV or heat @ 60°C for tacking or bonding UV opaque materials	UV/Heat	Excellent	Excellent	Fair	Clear	250 CPS	1.52	1.56	160,000	3,500	30%	85
NOA 84	Low refractive index adhesive for bonding glass.	UV	Excellent	Excellent	Fair	Clear	40–75 CPS	1.436	1.476	1140	649	57%	55
NOA 85	Low refractive index (1.46), low viscosity (200cps), recommended for bonding plastics and glass	UV	Excellent	Good	Good to Excellent	Clear	200 CPS	1.447	1.484	9,340	1,500	111%	40
NOA 85V	Low refractive index (1.46), low viscosity (200cps), visible light curing adhesive recommended for bonding plastics that absorb UV light	UV	Excellent	Good	Good to Excellent	Clear	200 CPS	1.447	1.484	9,340	1,500	111%	40
NOA 86	Low viscosity, UV and visible cure adhesive that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS	Excellent	Good	Good to Excellent	Clear	200 - 300 CPS	1.52	1.55	360,400	7,834	2.8%	75

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Type	Description	Cure	ADHESION TO:			Color	TYPICAL PROPERTIES						
							Viscosity at 25 Degrees C	REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 86H	Low viscosity, UV, visible, and heat cure @ 80°C that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS and/or heat	Excellent	Good	Good to Excellent	Clear	200 - 300 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 86HA	Low viscosity, UV, visible, and heat cure @ 60°C that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS and/or heat	Excellent	Good	Good to Excellent	Clear	200 - 300 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 86S	Low viscosity, UV and visible cure adhesive that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS	Excellent	Good	Good to Excellent	Clear	200 - 300 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 86TKH	High viscosity, UV, visible, and heat cure @ 80°C that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS and/or heat	Excellent	Good	Good to Excellent	Clear	170,000 – 200,000 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 86TLH	High viscosity, UV, visible, and heat cure @ 80°C that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS and/or heat	Excellent	Good	Good to Excellent	Clear	8,000 – 10,000 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 86TH	High viscosity, UV, visible, and heat cure @ 80°C that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS and/or heat	Excellent	Good	Good to Excellent	Clear	20,000 – 25,000 CPS	1.51	1.54	12,400	714	59%	60
NOA 86UV	Low viscosity, UV and visible cure adhesive that meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS	Excellent	Good	Good to Excellent	Clear	250 – 350 CPS	1.52	1.55	360,400	7,834	2.8%	75
NOA 87	Higher viscosity and meets the Bellcore specifications of 85C/85RH for 2000 hours	UV/VIS	Excellent	Good	Good to Excellent	Clear	900 – 1,500 CPS	1.49	1.52	209,700	4,880	13%	50
NOA 88	Low outgassing adhesive for aerospace or electronic applications. Excellent transmission in UV range.	UV	Excellent	Excellent	Fair	Clear	250 CPS	1.52	1.56	131,000	2,000	41%	90
NOA 89	Low viscosity UV cure for coatings and bonding delicate parts	UV	Excellent	Excellent	Fair	Clear	15- 20 CPS	1.48	1.51	4,300	195	10%	40
NOA 89H	Low viscosity UV and heat cure @ 80°C for coatings and bonding delicate parts.	UV/ Heat	Excellent	Excellent	Fair	Clear	15 - 20 CPS	1.48	1.51	4,300	195	10%	40

NorlandOpticalAdhesive(NO A)

NORLAND LOW REFRACTIVE INDEX ADHESIVES													
Type	Description	Cure	ADHESION TO:			Color	TYPICAL PROPERTIES						
							Viscosity at 25 Degrees C	REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	ShoreD Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 1315	Low viscosity adhesive with a refractive index of 1.315 for bonding plastic and glass	UV	Excellent	Good	Good	Clear	15 CPS	1.315	1.365	N/A	N/A	N/A	N/A
NOA 132	Low refractive index adhesive (1.32) for bonding glass or plastic	UV	Excellent	Good	Good	Clear	15 CPS	1.32	1.366	N/A	N/A	N/A	N/A
NOA 1327	Higher viscosity low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Good	Clear	4,500 – 5,500 CPS	1.327	1.365	N/A	N/A	N/A	15
NOA 1328	Higher viscosity low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Good	Clear	2,000 – 3,000 CPS	1.328	1.365	N/A	N/A	N/A	15
NOA 133	Low refractive index adhesive (1.33) for bonding glass or plastic	UV	Excellent	Good	Good	Clear	15 CPS	1.33	1.370	N/A	N/A	N/A	N/A
NOA 1348	Low refractive index adhesive (1.348) for bonding glass or plastic	UV	Excellent	Good	Good to Excellent	Clear	160 CPS	1.348	1.375	22,927	948	18%	30
NOA 136	Low refractive index adhesive (1.36) for bonding glass or plastic	UV	Excellent	Good	Good to Excellent	Clear	160 CPS	1.36	1.386	N/A	N/A	N/A	55
NOA 13685	Low refractive index adhesive (1.3685) for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	15 - 25 CPS	1.37	1.43	N/A	N/A	N/A	N/A
NOA 1369	Low refractive index adhesive (1.369) for bonding glass or plastic	UV	Excellent	Good	Good to Excellent	Clear	2100 CPS	1.37	1.382	10,578	1,130	52%	30
NOA 1375	Low refractive index adhesive (1.375) for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	45–60 CPS	1.38	1.43	N/A	N/A	N/A	N/A
NOA 13775	Low refractive index adhesive (1.3775) for bonding glass or plastic	UV	Excellent	Excellent	Good to Excellent	Clear	4000 CPS	1.377	1.391	58,984	1,744	42%	45

Norland Optical Adhesive (NOA)

NORLAND LOW REFRACTIVE INDEX ADHESIVES													
Type	Description	Cure	ADHESION TO:			Color	TYPICAL PROPERTIES						
							Viscosity at 25 Degrees C	REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 138	Low viscosity adhesive with a refractive index of 1.38 for bonding plastic and glass	UV	Excellent	Good	Fair	Clear	100 - 120 CPS	1.38	1.435	N/A	N/A	N/A	N/A
NOA 13825	Low refractive index adhesive (1.3825) for bonding glass or plastic	UV	Excellent	Good	Good to Excellent	Clear	5600 CPS	1.38	1.392	42,176	1599	56%	45
NOA 139	Low refractive index adhesive (1.39) for bonding glass or plastic	UV	Excellent	Good	Good to Excellent	Clear	865 CPS	1.37	1.388	14,850	807	51%	45
NOA 141	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Good	Clear	20 CPS	1.4	1.458	N/A	N/A	N/A	N/A
NOA 142	Low refractive index adhesive (1.42) for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	20 - 40 CPS	1.41	1.469	N/A	N/A	N/A	N/A
NOA 1422	Low refractive index adhesive for bonding glass or plastic	UV/VIS	Excellent	Good	Good to Excellent	Clear	1100 CPS	1.397	1.409	N/A	N/A	N/A	20
NOA 1422H	Low refractive index UV, visible, and heat cure @ 80°C adhesive for bonding glass or plastic	UV/VIS and/or Heat	Excellent	Good	Good to Excellent	Clear	1100 CPS	1.397	1.409	N/A	N/A	N/A	20
NOA 144	Low refractive index adhesive (1.44) for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	45 - 60 CPS	1.421	1.47	N/A	N/A	N/A	N/A
NOA 1442	Low refractive index adhesive for bonding glass or plastic	UV/VIS	Excellent	Good	Good to Excellent	Clear	1100 CPS	1.416	1.421	N/A	N/A	N/A	20
NOA 1442H	Low refractive index adhesive for bonding glass or plastic	UV/VIS and/or Heat	Excellent	Good	Good to Excellent	Clear	1100 CPS	1.416	1.421	N/A	N/A	N/A	20
NOA 145	Low refractive index adhesive for bonding glass or plastic	UV/VIS	Excellent	Good	Good to Excellent	Clear	200 CPA	1.439	1.469	N/A	N/A	N/A	N/A

Norland Optical Adhesive (NOA)

NORLAND LOW REFRACTIVE INDEX ADHESIVES													
Type	Description	Cure	ADHESION TO:			Color	TYPICAL PROPERTIES						
							Viscosity at 25 Degrees C	REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 1459	Low refractive index adhesive for bonding glass or plastic	UV/VIS	Excellent	Good	Good to Excellent	Clear	900–1000 CPS	1.439	1.459	N/A	N/A	N/A	20
NOA 146H	Low refractive index adhesive (1.46) that can be UV and/or Heat cured @80°C for bonding glass or plastic	UV/VIS and/or Heat	Excellent	Good	Good to Excellent	Clear	40 CPS	1.46	1.491	N/A	N/A	N/A	N/A
NOA 147	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	200 CPS	1.436	1.474	N/A	N/A	N/A	N/A
NOA 148	Low refractive index adhesive (1.48) for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	300 CPS	1.441	1.474	2,465	992	84.4%	Shore A 90
NOA 1485	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	900 – 1,000 CPS	1.459	1.480	N/A	N/A	N/A	50
NOA 1492	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	900 – 1,000 CPS	1.466	1.486	N/A	N/A	N/A	55
NOA 1504	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	1,000	1.485	1.504	N/A	N/A	N/A	70
NOA 1533	Low refractive index adhesive for bonding glass or plastic	UV	Excellent	Good	Fair	Clear	1,200 CPS	1.50	1.533	20,000	1,500	80%	50

Norland Optical Adhesive (NOA)

NORLAND HIGH REFRACTIVE INDEX ADHESIVES													
Type	Description	Cure	ADHESION TO:			Color	Viscosity at 25° C	TYPICAL PROPERTIES					
								REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			Glass	Metal	Plastic			LIQUID	CURED				
NOA 160	High refractive index adhesive for bonding glass, plastic, and metal	UV	Excellent	Good	Good	Clear	2000 CPS	1.58	1.60	N/A	N/A	N/A	N/A
NOA 161H	High refractive index adhesive for bonding glass, plastics, and metal that can be UV/Vis or heat 80°C cured	UV/Vis and/or Heat	Excellent	Good	Good	Slight Yellow	200 – 300 CPS	1.59	1.61	1,040	72	6.1%	60
NOA 1622H	High refractive index adhesive for bonding glass, plastics and metal that can be UV or heat 80°C cured	UV/Heat	Excellent	Good	Good	Slight Yellow	220 CPS	1.60	1.622	N/A	N/A	N/A	10
NOA 1624	Higher viscosity adhesive, high refractive index adhesive for bonding glass	UV	Excellent	Good	Good	Clear	1,100 – 1,200 CPS	1.60	1.624	N/A	N/A	N/A	70
NOA 1639H	High refractive index adhesive for bonding glass, plastics and metal that can be UV or heat 80°C cured	UV/Heat	Excellent	Good	Good	Slight Yellow	240CPS	1.61	1.639	N/A	N/A	N/A	10
NOA 165H	High refractive index adhesive for bonding glass, plastics and metal that can be UV or heat 80°C cured	UV/Vis and/or Heat	Excellent	Good	Good	Slight Yellow	200 – 300 CPS	1.62	1.65	146	233	150%	55
NOA 1665	High refractive index adhesive for bonding glass, plastics and metal	UV/VIS	Excellent	Good	Good	Clear	800 – 1000 CPS	1.665	1.69	N/A	N/A	N/A	60
NOA 168H	Higher viscosity adhesive, high refractive index UV, visible, and heat cure @ 80°C adhesive for bonding glass	UV/VIS and/or Heat	Excellent	Good	Good	Clear	4000 CPS	1.644	1.664	N/A	N/A	N/A	75
NOA 170	High refractive index adhesive (1.70) for bonding glass to glass	UV/VIS	Excellent	Good	Good	Clear	4800 CPS	1.68	1.705	863	90,200	1.3%	75
NOA 170C	High refractive index adhesive for bonding glass to glass	UV/VIS	Excellent	Good	Good	Clear	2,400 CPS	1.667	1.697	N/A	N/A	N/A	85
NOA 170F	High refractive index adhesive for bonding glass to glass	UV/VIS	Excellent	Good	Good	Clear	800 – 900 CPS	1.67	1.70	N/A	N/A	N/A	30

Norland Optical Adhesive (NOA)

	SPECIAL APPLICATIONS:												
							TYPICAL PROPERTIES						
							Viscosity at 25 Degres C	REFRACTIVE INDEX		Modulus PSI	Tensile PSI	Elongation at Failure	Shore D Hardness
			ADHESION TO:					LIQUID	CURED				
Type	Description	Cure	Glass	Metal	Plastic	Color							
UVS 91	Screenable past for bonding and sealing perimeters of liquid crystal displays	UV	Excellent	Good	Good to Excellent	Translu cent	Thixotropic Paste	N/A	N/A	45,000	2,900	58%	55
IML150	Index matching liquid with a refractive index of 1.52. Used as a temporary mounting material. This liquid is not an adhesive.	N/A	N/A	N/A	N/A	Light Yellow	100 CPS	1.52	N/A	N/A	N/A	N/A	N/A
NBA 107	UV curing adhesive for cold blocking and temporary bonding of lenses to metal polishing mounts.	UV	Excellent	Excellent	Fair	Clear	350 CPS	1.48	1.51	800	76	5%	15
NBA 108	High strength UV curing adhesive for cold blocking and temporary bonding. Can be dissolved with acetone.	UV	Excellent	Excellent	Fair	Clear	550 CPS	1.48	1.51	710	101	18%	25
NBA 108H	High strength UV or heat curing @80°C for cold blocking and temporary bonding. Can be dissolved with acetone.	UV and/or Heat	Excellent	Excellent	Fair	Clear	550 CPS	1.48	1.51	710	101	18%	25
NBA 110	High strength UV curing adhesive for cold blocking and temporary bonding. Can be dissolved with acetone.	UV	Excellent	Excellent	Fair	Clear	35,000 – 40,000 CPS	N/A	N/A	N/A	N/A	N/A	SHORE A 80



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