Catheter Assembly *Needle Bonding* *Tube Set Assembly* *Anesthesia Mask Bonding* *Respiratory Device Assembly*

MD® Medical Device Adhesives

DYMAX®

ISO 10993 Biocompatible *Class VI Certified* *Solvent-Free Formulations* *Cures in Seconds with UV/Visible Light*

ABOUT DYMAX

DYMAX understands the demands of the medical device market. With over 30 years of direct participation, DYMAX continues to provide medical device manufacturers with innovative adhesive products and assembly solutions which result in improved productivity and reduced processing costs.

A global team of technical professionals dedicated to medical device assembly readily assists manufacturers with adhesive selection, dispensing options, curing recommendations, biocompatibility testing, component design, and process validation.

DYMAX pioneered the development of light curing adhesives for medical device assembly. This selector guide identifies our standard product offerings for typical device assembly applications involving catheters, guidewires, reservoirs, syringes, breathing circuits, and IV tube sets. Hundreds of formulations are available. If a truly customized solution is more desirable, our R&D team can assist manufacturers in developing an adhesive for their application.

TYPICAL ISO 10993 BIOCOMPATIBILITY TESTS PERFORMED ON DYMAX MD® MEDICAL DEVICE ADHESIVES

Acute Systemic Toxicity • Cytotoxicity • Hemocompatibility • Irritation / Intracutaneous • Implantation (14 day)

ADHESIVE BIOCOMPATIBILITY & STERILIZATION

Polymerized DYMAX MD® Medical Device adhesives are biocompatibility tested in accordance with ISO 10993 and/or USP Class VI. Each Product Data Sheet (PDS) lists completed test results. Copies of the test reports are available upon request. In all cases, it is the user's responsibility to determine and validate the suitability of these adhesives in the intended medical device.

We have not tested these adhesives for prolonged or permanent implantation, and are they only intended for use in short-term (<29 days) or single-use disposable device applications. DYMAX does not authorize their use in long-term implant applications.

Compatible sterilization methods include gamma irradiation and ethylene oxide. Sterilization by autoclaving may be limited to certain applications. It remains the user's obligation to ascertain the effect of sterilization on the cured adhesive.

CATHETER and GUIDEWIRE-BONDING ADHESIVES

The DYMAX "CTH" line of UV and visible light curable catheter bonding adhesives provides reliable cost-saving assembly solutions for catheter manufacturers. These products are ISO 10993 approved and formulated to meet the unique assembly challenges associated with the newest catheter materials.

DYMAX light curing adhesives are solvent free, have excellent adhesion, a high degree of flexibility, and fast cure speeds for consistent, low-stress catheter assembly. In-line inspection is also possible with the patented fluorescing technology included in all featured catheter-bonding adhesives. These products are compatible with gamma, EtO, and E-Beam sterilization.

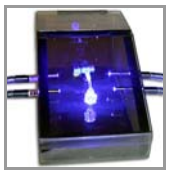
PROPERTIES*	**203A-CTH-F**	**204-CTH-F**	**207-CTH**	**208-CTH-F**	**209-CTH**
Bondable Substrates Include:	SS, aluminum, NiTi, PA, PMMA	PC, PVC, PU, ABS, PET, PEBA	SS, aluminum, NiTi	PC, PA, PMMA, PU, PVC, SS, PET	PC, PVC, ABS, PMMA, PA, SS
Features	Secondary thermal cure capability	Flexible; moisture resistant	Secondary thermal cure capability	Flexible; multipurpose	Multipurpose
Applications	Guidewire assembly, lumen sealing, sensor attachment	Balloon/lumen, plastics bonder	Guidewire assembly	Balloon/lumen, catheter bonder	Manifold/lumen, plastic and metal bonder
Fluorescing (U.S. Patent 6,080,450)	Yes	Yes	Yes	Yes	Yes
ISO 10993 Biocompatibility	Yes	Yes	Yes	Yes	Yes
USP Class VI Biocompatibility	Yes	Yes	Yes	Yes	Yes
Nominal Viscosity, cP (20 rpm)	55 • 600 • 3,250 • 11,000 • 24,500	155 • 500 • 6,500 • 15,500 • 24,000	450 • 4,000 • 12,500 • 26,500	300	300
Durometer Hardness	D77	D55	D70	D55	D70
Tensile at Break, MPa [psi]	29 [4,200]	17 [2,500]	22 [3,200]	10 [1,400]	17 [2,400]
Elongation at Break, %	10	180	28	230	70
Modulus of Elasticity, MPa [psi]	610 [88,000]	140 [20,000]	300 [43,000]	66 [9,600]	260 [38,000]
Linear Shrinkage, %	1.3	2.1	1.2	0.4	0.6
CURE DATA:					
Fixture Time: (0.05 mm) 0.002 Inch Depth (in seconds) Between Glass					
DYMAX BlueWave® 200 Spot Lamp (10,000 mW/cm^2)**	1.6	0.2	1.2	0.2	<0.2
SUBSTRATE BONDING GUIDE					
ABS acrylonitrile -butadiene-styrene	o	✓	o	✓	✓
NiTi Nickel titanium	✓	o	✓	o	o
PA polyamide	✓	o	o	✓	✓
PC polycarbonate		✓		✓	✓
PE polyethylene		st	st	st	st
PEBA polyether-block-amide	o	✓	o	✓	o
PET poly(ethylene terephthalate)	st	✓		✓	✓
PETG poly(ethylene terephthalate)glycol		o		✓	✓
PI polyimide	o	✓	o	✓	o
PMMA poly(methyl methacrylate)	✓	o		✓	✓
PS polystyrene	✓	✓		✓	✓
PU polyurethane	o	✓		✓	✓
PVC poly(vinyl chloride)		✓		✓	✓
SS stainless steel	✓	o	✓	✓	✓

✓ Recommended adhesive o Limited applications st Requires surface treatment (e.g., plasma, corona treatment, etc.)
**Customized adhesives and viscosities may be available upon request.*
***10,000 mW/cm^2 measured at work surface over the UVA range (320-395 nm) using the DYMAX ACCU-CAL™ 50 radiometer.*


Bond a variety of catheter substrates


Cure in seconds or less


A selection of convenient package sizes


Curing catheter with four-pole lightguide

NEEDLE-BONDING and SYRINGE-ASSEMBLY ADHESIVES

High-speed, high-volume needle bonding and syringe needle assembly is possible with DYMAX UV/Visible light curable adhesives. They are ISO 10993 approved and bond on demand at room temperature when exposed to UV or visible light. DYMAX MD® needle bonding adhesives are solvent free, single component, and fluoresce for in-line testing and inspection.

They are ideal for automated assembly lines and come in a broad range of product viscosities for design flexibility. Applications include bonding cannulas to hubs in various hypodermic and biopsy needles, syringes, and winged-infusion sets made from multiple plastics, metals, and glass. DYMAX MD® needle-bonding adhesives are compatible with gamma, EtO and E-Beam sterilization.

PROPERTIES*	**1160-M**	**1161-M**	**1162-M***	**1163-M**	**1180-M***	**1203-M-SC**
Bondable Substrates Include:	PC, ABS, SS, PVC	PC, ABS, PVC, PMMA, SS, PA	PC, SS, glass, PVC, ABS	PC, PVC, ABS, PMMA, SS	PC, PVC, PU, ABS, SS	PC, PVC, PMMA, SS, ABS, PA
Features	Low shrink; low-stress plastic bonder	Multipurpose plastic and metal bonder	Strong bonds to a variety of substrates; low shrinkage	Multipurpose; medium viscosity	Multipurpose; different viscosities available	Blue-to-clear color change
Applications	Needle bonding, transducer assembly, potting	Tube sets and fittings, reservoirs, needle bonding	Needle bonding	Needle bonding, reservoirs, tube sets and fittings	Needle bonding, reservoirs, transducer assembly	Needle bonding, tube sets and fittings, reservoirs
Fluorescing (U.S. Patent 6,080,450)	Yes	Yes	Yes*	Yes	Yes*	-
ISO 10993 Biocompatibility	Yes	Yes	Yes	Yes	Yes	Yes
USP Class VI Biocompatibility	Yes	Yes	Yes	Yes	Yes	-
Nominal Viscosity, cP (20 rpm)	90 • 165	300	200	5,000	150 • 14,000 • 27,000	300
Durometer Hardness	D75	D70	D75	D50	D70	D70
Tensile at Break, MPa [psi]	18 [2,600]	16 [2,300]	15 [2,100]	12 [1,800]	17 [2,500]	18 [2,600]
Elongation at Break, %	46	68	140	125	66	140
Modulus of Elasticity, MPa [psi]	380 [55,000]	280 [40,000]	390 [57,000]	97 [14,000]	330 [48,000]	260 [37,000]
Linear Shrinkage, %	0.4	0.6	0.4	0.6	0.8	0.2
CURE DATA						
Fixture Time: (0.05 mm) 0.002 Inch Depth (in seconds) Between Glass						
DYMAX BlueWave® 200 Spot Lamp (10,000 mW/cm^2)**	<0.2	<0.2	<0.2	<0.2	0.2	*
DYMAX 5000-EC Flood Lamp (200 mW/cm^2)***	<1	<1	<1	<1	<1	*
DYMAX UVC-6 Conveyor w/Fusion "D" Bulb (2,500 mW/cm^2)****	>8 .2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	*
SUBSTRATE BONDING GUIDE						
ABS acrylonitrile-butadiene-styrene	✓	✓	✓	✓	✓	✓
CAP cellulose acetate propionate	✓	o		o	✓	
GL glass		✓	✓	o		✓
PA polyamide		✓		o		✓
PC polycarbonate	✓	✓	✓	✓	✓	✓
PE polyethylene	st	st	st	st	st	
PMMA poly(methyl methacrylate)	o	✓		✓	✓	✓
PP polypropylene	st	st	st	st	st	
PS polystyrene	✓	✓	✓	✓	✓	
PU polyurethane	o	✓		✓	✓	✓
PVC poly(vinyl chloride)	✓	✓	✓	✓	✓	✓
SS stainless steel	✓	✓	✓	✓	✓	✓

✓ *Recommended adhesive* **o** *Limited applications* **st** *Requires surface treatment (such as corona, etc., or a mechanical lock hub design)*

*Customized adhesives and viscosities may be available upon request.

**10,000 mW/cm^2 measured at work surface over the UVA range (320-395 nm) using the DYMAX ACCU-CAL™ 50 radiometer.

***200 mW/cm^2 measured 2.5" below bottom of lamp housing. Measured by the ACCU-CAL™ 50 radiometer.

****2,500 mW/cm^2 measured by EIT Power Puck radiometer 2.1" below lamp housing.

*See individual Product Data Sheet (PDS) for cure data information

*Ultra-Red™ fluorescing grades available

Fluorescing for in-line inspection

RESPIRATORY-DEVICE ADHESIVES: ANESTHESIA MASKS, RESUSCITATOR BAGS, and BREATHING CIRCUITS

The DYMAX "MSK" line of UV/Visible light curable adhesives is formulated for bonding respiratory devices such as anesthesia masks, resuscitator bags, and breathing circuits. These products are solvent free, ISO 10993-5 Cytotoxicity approved and form strong, flexible bonds to a variety of substrates as well as highly plasticized plastics. "On demand" bonding at line speeds greater than 20 feet per minute (6.1 meters per minute) is possible, providing increased through-put without additional labor or line expansion.

The ability of selected "MSK" products to fluoresce upon exposure to low-intensity "black" light makes them ideally suited for in-line inspection. DYMAX respiratory-device adhesives are easily dispensed by syringe, dipping well, screen print, or spray and are compatible with gamma, EtO, and E-Beam sterilization.

PROPERTIES*	**109-MSK***	**110-MSK**	**111-MSK**
Bondable Substrates Include:	ABS, PVC, PU, surface-treated silicone	PVC, PC, PU, ABS	PVS, SEBS, PU, PS
Features	Moisture resistant, strong bonds to PVC	Flexible; bonds to plasticized substrates	Bonds to thermoplastic elastomers; moisture resistant
Applications	Facemasks, breathing circuits	Facemasks, tube sets and fittings, breathing circuits, resuscitator bags	Facemasks, tube sets and fittings, breathing circuits, resuscitator bags
Fluorescing (U.S. Patent 6,080,450)	No	No	Yes
ISO 10993 Biocompatibility	ISO 10993-5	ISO 10993-5	ISO 10993-5
USP Class VI Biocompatibility	Cytotoxicity	Cytotoxicity	Cytotoxicity
Nominal Viscosity, cP (20 rpm)	800	9,500	280
Durometer Hardness	D65	A58	D50
Tensile at Break, MPa [psi]	22 [3,200]	4.1 [590]	6 [900]
Elongation at Break, %	38	230	200
Modulus of Elasticity, MPa [psi]	430 [62,000]	3.6 [520]	70 [10,000]
Linear Shrinkage, %	0.6	1.8	0.5
CURE DATA			
Fixture Time: (0.05 mm) 0.002 Inch Depth (in seconds) Between Glass			
DYMAX 5000-EC Flood Lamp (200 mW/cm^2)**	1	1	<1
DYMAX UVC-6 Conveyor w/Fusion "D" Bulb (2,500 mW/cm^2)***	8.2 m/min [27 ft/min]	>8.2 m/min [>27 ft/min]	8.2 m/min [27 ft/min]
SUBSTRATE BONDING GUIDE			
ABS acrylonitrile-butadiene-styrene	✓	✓	✓
PC polycarbonate	o	✓	o
PVC poly(vinyl chloride)	✓	✓	✓
SEBS styrene-ethylene/butylene-styrene			✓
Silicone platinum cured	st		

✓ *Recommended adhesive* **o** *Limited applications* **st** *Requires surface treatment (e.g., plasma, corona treatment, etc.)*

**Customized adhesives and viscosities may be available upon request.*

***200 mW/cm^2 measured 2.5" below bottom of lamp housing. Measured by the ACCU-CAL™ 50 radiometer.*

****2,500 mW/cm^2 measured by EIT Power Puck radiometer 2.1" below lamp housing.*

**Ultra-Red™ fluorescing grades available*

Automated facemask curing

MSK adhesives bond to a wide variety of substrates

MD® MULTIPURPOSE BONDING ADHESIVES

DYMAX UV and visible light curable adhesives for medical devices significantly reduce assembly process costs. The DYMAX MD® "1000" series adhesives are solvent free and cure within seconds upon exposure to UV and visible light and permit bonding of UV-inhibited and tinted plastics. In-line inspection of the adhesive bond line is made possible with the patented fluorescing chemistry.

DYMAX medical device adhesives glow brightly when exposed to a low-intensity "black light" and enhance the function of automated vision equipment for high-speed, high-volume production.

These products are ISO 10993 approved and are ideal for bonding a wide variety of substrates found in reservoirs and housings, respiratory devices, needles and syringes transducers, tube sets and fittings, and other medical disposables. DYMAX MD® adhesives are compatible with gamma, EtO, and E-Beam sterilization.

PROPERTIES*	**1128A-M**	**1161-M**	**1162-M***	**1163-M**	**1165-M**	**1168-M**	**1180-M***	**1187-M**
Bondable Substrates Include:	SS, aluminum, glass, PA, PMMA, PS	PC, ABS, PVC, PMMA, SS, PA	PC, SS, glass, PVC, ABS	PC, PVC, ABS, PMMA, SS	PVC, PC, PU, ABS, EVA	PC, PA, PMMA, PU, PVC, SS, PET	PC, PVC, PU, ABS, SS	PC, PVC, PU, ABS, PET
Features	High strength; impact resistant; secondary thermal cure capability; different viscosities available	Multipurpose plastic and metal bonder	Strong bonds to a variety of substrates; low shrinkage	Multipurpose; plastic/metal bonder; medium viscosity	Silicone-like softness; cures with dry surface	Flexible adhesive for multiple substrates	Multipurpose; different viscosities available	Moisture resistant; clear bond lines; flexible; different viscosities available
Applications	Needle and metal bonding	Tube sets, reservoirs, needle bonding	Plastic and needle bonding	Tube sets, reservoirs, needle bonding	Tube sets, gaskets	Tube sets, metal-to-plastic bonding	Needle bonding, reservoirs, transducer assembly, medical potting	Reservoirs, tube sets
Fluorescing (U.S. Patent 6,080,450)	Yes	Yes	Yes*	Yes	Yes	Yes	Yes*	Yes
ISO 10993 Biocompatibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USP Class VI Biocompatibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nominal Viscosity, cP (20 rpm)	55 600 3,250 11,000 24,500	300	200	5,000	10,000	300	150 14,000 27,000	155 450 6,500 10,000 15,500 24,000
Durometer Hardness	D76	D70	D75	D50	A55	D55	D70	D55
Tensile at Break, MPa [psi]	30 [4,300]	16 [2,300]	15 [2,100]	12 [1,800]	3.8 [550]	9.0 [1,300]	17 [2,500]	17 [2,400]
Elongation at Break, %	10	68	140	125	250	230	66	170
Modulus of Elasticity, MPa [psi]	620 [90,000]	280 [40,000]	390 [57,000]	97 [14,000]	3.6 [520]	68 [9,800]	330 [48,000]	170 [25,000]
Linear Shrinkage, %	1.2	0.6	0.4	0.6	1.6	0.3	0.8	2.0
CURE DATA								
DYMAX BlueWave® 200 Spot Lamp (10,000 mW/cm^2)**	1.6	<0.2	<0.2	<0.2	0.4	0.2	0.2	0.2
DYMAX 5000-EC Flood Lamp (200 mW/cm^2)***	1	<1	<1	<1	1	<1	<2	<1
DYMAX UVC-6 Conveyor w/Fusion "D" bulb (2,500 mW/cm^2)****	8.2 m/min [27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]	>8.2 m/min [>27 ft/min]

Customized adhesives and viscosities may be available upon request.
***10,000 mW/cm^2 measured at work surface over the UVA range (320-395 nm) using the DYMAX ACCU-CAL™ 50 radiometer.*
****200 mW/cm^2 measured 2.5" below bottom of lamp housing. Measured by the ACCU-CAL™ 50 radiometer.*
*****2,500 mW/cm^2 measured by EIT Power Puck radiometer 2.1" below lamp housing.*
**Ultra-Red™ fluorescing grades available*

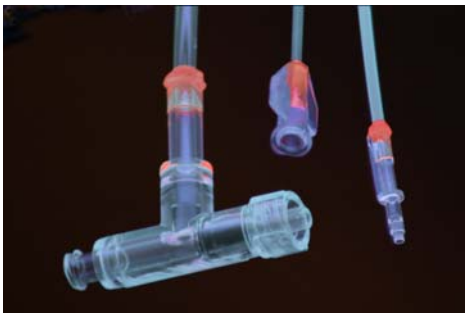
MD® MULTIPURPOSE ADHESIVE / Substrate Bonding Guide - Medical Plastics/Materials

PRODUCTS*	1128A-M	1161-M	1162-M*	1163-M	1165-M	1168-M	1180-M*	1187-M
PLASTICS								
ABS acrylonitrile-butadiene-styrene	o	✓	✓	✓	✓	✓	✓	✓
CAP cellulose acetate propionate	o	o		o			✓	
COPE copolyetheresters	o	✓		✓			**o**	✓
EP Epoxy, FR-4 Circuit Board		✓		✓			✓	
EVA ethylene-vinyl acetate	st				✓			
HDPE high density polyethylene		st	st	st	st	st	st	st
LDPE low density polyethylene	st	st	st	st	st	st	st	st
MBS methacrylate-butadiene-styrene	o	o		o		✓	✓	o
PA polyamide	✓	✓		o		✓		o
PC polycarbonate		✓	✓	✓	✓	✓	✓	✓
PC/ABS Blend blend of PC and ABS		✓	✓	✓	✓	✓	✓	✓
PC/PCTG Blend blend of PC and PCTG		✓	✓	✓	✓	✓	✓	o
PCTG poly(cyclohexylene dimethylene terephthalate)glycol		✓	✓	✓	✓	✓	✓	o
PEBA polyether block amide	o	o				✓		✓
PEI polyetherimide		o						
PES polyethersulfone		o		o				o
PET poly(ethylene terephthalate)	st	✓	✓	o	o	✓	o	✓
PETG poly(ethylene terephthalate)glycol		✓		✓		✓	o	✓
PI polyimide	o	o		o	o	✓		✓
PMMA poly(methyl methacrylate)	✓	✓		✓	o	✓	✓	o
POM polyoxymethylene								
PPO poly(phenylene oxide)	o	o		o			o	o
PS polystyrene	✓	✓	✓	✓	o	✓	✓	✓
PSU polysulfone		o					o	o
PU polyurethane	o	✓		✓	✓	✓	✓	✓
PVC poly(vinyl chloride)		✓	✓	✓	✓	✓	✓	✓
SB styrene-butadiene		o		o	o	✓	✓	
SAN styrene-acrylonitrile	✓	✓					o	✓
TPU thermoplastic polyurethane	o	o		o	o	✓	✓	✓
OTHER MATERIALS								
AL aluminum	✓		✓	o		o		
CER ceramic	✓	o		o	o			
GL glass	✓	✓	✓	o	o			
SS stainless steel	✓	✓	✓	✓	o	✓	✓	

✓ *Recommended adhesive* **o** *Limited applications* **st** *Requires surface treatment (such as corona, etc., or a mechanical lock hub design)*
**Customized adhesives and viscosities may be available upon request.*
**Ultra-Red™ fluorescing grades available*

Ultra-Red™ Fluorescing Technology

DYMAX has introduced a new technology that enhances bond-line inspection processes and product authentication. Ultra-Red™ Fluorescing technology can be incorporated into existing adhesive formulations. The adhesives remain clear until exposed to low-intensity UV light (typical inspection lights), at which point they fluoresce bright red. This is particularly effective when bonding plastics that naturally fluoresce blue, such as PVC and PET. The patented *Ultra-Red* fluorescence also produces a unique spectral signature that can be used by manufacturers for their product authentication.



Tube sets bonded with DYMAX *Ultra-Red* adhesives fluoresce bright red

SEE-CURE TECHNOLOGY

How do I know that sufficient adhesive has been dispensed? How do I know when it's cured?

DYMAX adhesives containing See-Cure technology provide the ability to answer these questions. Uncured See-Cure adhesives are bright blue in color. This makes them easy to see after dispensing.

During the light curing process, the blue color transitions to clear, indicating that sufficient energy was received by the adhesive to complete the curing process. This visual cure-indicator may initially be used to qualify the process and then to ensure that the process remains within the qualified parameters.

PROPERTIES*	1201-M-SC	1202-M-SC	1203-M-SC	1204-M-SC
Bondable Substrates Include:	PC, PVC, PU, ABS, PET, PEBA	PMMA, PA, PC, PU, PVC, PET, SS	PC, PVC, PMMA, SS, ABS, PA	PVC, PU, ABS, PC EVA
Features	Blue-to-clear color change; flexible	Blue-to-clear color change; flexible	Blue-to-clear color change; adhesion to numerous substrates	Blue-to-clear color change; low shrinkage; very flexible
Applications	Tube sets, reservoirs, and catheters	Tube sets, metal-to-plastic assembly, catheters, and reservoirs	Needle bonding, tube sets and fittings, and reservoirs	Tube sets and fittings, face masks, and tracheal tubes
ISO 10993 Biocompatibility	Yes	Yes	Yes	Yes
Nominal Viscosity, cP (20 rpm)	450	300	300	12,000
Durometer Hardness	D60	D55	D70	A60
Tensile at Break, MPa [psi]	14 [2,000]	11 [1,600]	18 [2,600]	6.9 [1,000]
Elongation at Break, %	170	230	140	380
Modulus of Elasticity, MPa [psi]	120 [17,000]	100 [15,000]	260 [37,000]	5.1 [740]
Linear Shrinkage, %	2.4	2.0	0.2	0.1

**Customized adhesives and viscosities may be available upon request.*
Note: Please refer to individual Product Data Sheets (PDS) for cure data information

The Safety Factor Chart

To verify that See-Cure technology consistently serves as a reliable indicator of full cure, DYMAX performed extensive testing with a wide variety of its light curing adhesive products. The test matrix included standard adhesives with a broad range of adhesive cure speeds and cured properties. Using existing specifications from each standard adhesive as a control, the adhesives adjusted with See-Cure were tested again to the same specifications. All physical cured properties of the sample group remained within the measured values of the original specifications.

In addition, the adhesive products designated for medical device assembly were formulated with the See-Cure technology and tested for biocompatibility. The test results confirm that the addition of See-Cure technology has no affect on the biocompatibility rating of the original product.

To illustrate the concept of See-Cure technology, measurements of product hardness were taken during curing cycles to determine the point of full cure. These were plotted against measurements of adhesive color intensity at the same time intervals.

The Safety Factor Chart

The graph above depicts the typical relationship between the progression of adhesive cure and the diminishing color of See-Cure technology within the adhesive. As verified by the graphed measurements, the final color change from blue occurs after adhesive curing has taken place.

SEE-CURE ADHESIVES / Substrate Bonding Guide – Medical Plastics/Materials

PRODUCTS*	1201-M-SC	1202-M-SC	1203-M-SC	1204-M-SC
PLASTICS				
ABS acrylonitrile-butadiene-styrene	✓	✓	✓	✓
CAP cellulose acetate propionate			o	
COPE copolyetheresters	✓		✓	
EP Epoxy, FR-4 Circuit Board			✓	
EVA ethylene-vinyl acetate				✓
HDPE high density polyethylene	st	st	st	st
LDPE low density polyethylene	st	st	st	st
MBS methacrylate-butadiene-styrene	o	✓	o	
PA polyamide	o	✓	✓	
PC polycarbonate	✓	✓	✓	✓
PC/ABS Blend blend of PC and ABS	✓	✓	✓	✓
PC/PCTG Blend blend of PC and PCTG	o	✓	✓	✓
PCTG poly(cyclohexylene dimethylene terephthalate)glycol	o	✓	✓	✓
PEBA polyether block amide	✓	o	o	
PEI polyetherimide			o	✓
PES polyethersulfone	o		o	
PET poly(ethylene terephthalate)	✓	✓	✓	o
PETG poly(ethylene terephthalate)glycol	✓	✓	o	
PI polyimide		✓	o	
PMMA poly(methyl methacrylate)	o	✓	✓	o
POM polyoxymethylene				
PPO poly(phenylene oxide)				
PS polystyrene	✓	o	✓	o
PSU polysulfone				
PU polyurethane	✓	✓	✓	✓
PVC poly(vinyl chloride)	✓	✓	✓	✓
SB styrene-butadiene		✓	o	o
SAN styrene-acrylonitrile	✓		✓	
TPU thermoplastic polyurethane	✓	✓	✓	✓
OTHER MATERIALS				
AL aluminum		o	o	
CER ceramic			o	
GL glass			✓	
SS stainless steel		o	✓	

✓ *Recommended adhesive* **o** *Limited applications* **st** *Requires surface treatment (such as corona, etc., or a mechanical lock hub design)*
**Customized adhesives and viscosities may be available upon request.*

See it Dispense.

See It Cure

See the Solution.

See it Cure from Blue to Clear

A DYMAX adhesive formulated with See-Cure technology changes from bright blue-to-clear, indicating the adhesive is fully cured.

MEDI-CURE® 222 SERIES CYANOACRYLATES

Low-odor, low-bloom, medical-grade cyanoacrylate adhesives offer exceptional product stability and faster cure speeds over other cyanoacrylates. The DYMAX *MEDI-CURE*® 222 Series medical device instant adhesives can replace many different grades of both methyl and ethyl cyanoacrylates due to their ability to adhere to a wide selection of substrates over a broad temperature range.

222 Series medical-grade cyanoacrylates can lower your costs by reducing the number of inventoried products necessary for the manufacturing of medical disposable devices. They are solvent free, ISO 10993 approved, Class VI certified, and are excellent for bonding opaque and difficult-to-bond-to substrates.

PRODUCT	FEATURES	SUBSTRATES BONDED	VISCOSITY
222/3	Solvent free; high strength; instant curing; wide surface compatibility; USP Class VI and ISO 10993 Biocompatibility	Ceramic, Glass, Graphite, Latex, PC, PVC, PEEK, PETG, PSU, SAN, SS	3 cP
222/50			50 cP
222/100			100 cP
222/450			450 cP
222/1700			1700 cP
222/GEL			Thixotropic gel

PROPERTIES		
Uncured		
Solvent Content	None – 100% Reactive Solids	
Chemical Class	Modified Ethyl Cyanoacrylate	
Appearance	Colorless Liquid	
Solubility	Nitromethane, Acetone, Dimethylformamide	
Toxicity	Low	
Flash Point	85°C (185°F)	
Specific Gravity	1.06	
Shelf Life @ 40°F	One year from date of shipment in unopened containers	
Cured*		
Shear Strength (.05" overlap, 23°C, 25% RH)		
Steel	2,000 - 4,500 psi ASTM D-1002	
Stainless Steel	1,000 - 2,500 psi ASTM D-1002	
Aluminum	400 - 1,400 psi ASTM D-1002	
Polycarbonate	400 - 1,000 psi ASTM D-1002	
ABS	1,200 - 2,000 psi ASTM D-1002	
Thermal Limit (brittle/degrades)	-55° to 93°C (-65°/+200°F)	
Softening Point	329°F	
Refractive Index 20°C	1.49	
Dielectric Strength	11.6 kV/mm ASTM D-1304	
Dielectric Constant (1 kHz)	5.4 ASTM D-1304	
Coefficient of Linear Thermal Expansion	80 x 10^{-6}	
Cure	**Fixture Speed, Seconds***	
Data	**222/3 through 222/1700**	**222-GEL**
Plastic to Plastic	5-30	20-40
Rubber to Rubber	5-10	12-20
Metal to Metal	2-30	30-90
With 521 Accelerator**	0-5	0-10
Without 521 Accelerator	5-40	5-60

**Cure speed and strength vary widely with 1) surface properties, 2) absorbed moisture and 3) gap thickness. Dry acidic surfaces cure slower. Basic surfaces accelerate cure speed.*

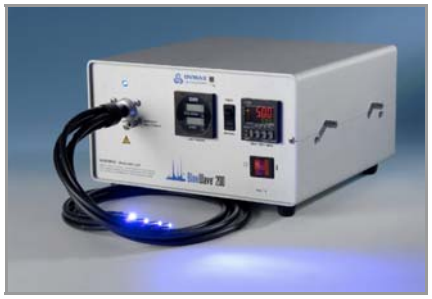
***May bond on contact. Maximum cure thickness 0.004" (0.1 mm). Strength continues to build for up to 24 hours at 68°F.*

UV LIGHT CURING EQUIPMENT FOR MEDICAL ADHESIVE BONDING

FLOOD CHAMBERS, SPOT LAMPS, CONVEYOR CURING SYSTEMS, and RADIOMETERS

Successful UV processing demands that the curing equipment be matched to the resin to optimize both performance and cost savings. DYMAX manufactures both light curable resins and light curing equipment, and specializes in optimization of light curing processes.

Our technical specialists are ready to help you optimize your process, and maximize your profit and product performance. For resin and equipment selection assistance, please call the DYMAX Applications Engineering Department.



BlueWave® 200 UV Curing Spot Lamp

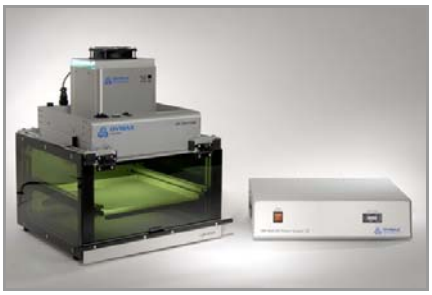
Patent pending intensity adjustment feature provides high-intensity UV/visible light in a concentrated area. Ideal for integration with automated equipment and multiple output lightguides. CE Marked.

BlueWave® 75 UV Spot Curing Lamp

Provides the optimal combination of low operating cost with high-intensity output to accommodate a majority of bonding applications. CE Marked.

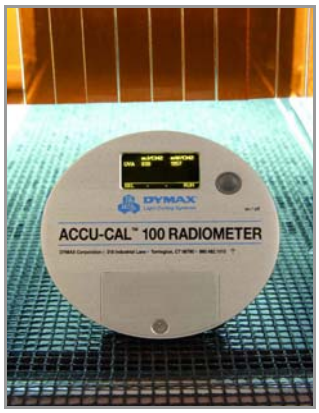
BlueWave® LED Visible Spot Curing Lamp

Generates high-intensity visible light through an array of surface mounted LEDs. Provides cool cures and constant intensity with no bulbs to change. No warm up required.



5000 UV Curing Flood Lamp System

Has shutter and protective enclosure. Ideal for single-component or batch-curing processes requiring moderate intensity and a 5" x 5" (12.7 cm x 12.7 cm) cure area. CE Marked PC Series Flood Systems available for European production facilities.



ACCU-CAL™ 100 Radiometer

Perfect for process monitoring of UV/Visible light curing conveyor systems. CE Marked.

ACCU-CAL™ 50 and ACCU-CAL™ 50V Radiometers

Perfect for process monitoring of spot and flood UV/Visible light curing systems. CE Marked.

UV Light Curing Conveyor Systems

Ideal for providing consistent curing for high-volume and high-speed assembly.

UV Light Curing Conveyor Systems

Specifically designed for compliance with European standards. For European markets only. CE Marked.

Accessories for UV Curing Lamps

Lightguides, shutters, shields, goggles, bulbs, and rod lenses are available to complement any DYMAX UV curing system. Visit www.dymax.com for more information.

For further assistance with adhesive and equipment selection, contact your DYMAX Applications Engineer.

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In Europe Call: +49 (0) 69 / 7165-3568
In Asia Call: +86.755.83485759

www.dymax.com
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