



# Adhesive Solutions for Medical Device Assembly

Through innovative technologies and applications, we cover all of your critical medical device adhesion needs so your products perform as they should. Leveraging our broad range of technologies, H.B. Fuller delivers a complete medical device assembly solution. From needle bonding, to catheter assembly, and devices yet to be imagined, our advanced medical device adhesive technologies deliver reliable performance.



# Medical Adhesives H.B. FULLER CYBERBOND CB

H.B. Fuller is committed to continually improving the quality and reliability of medical devices through their high-performance, engineered adhesives brand, Cyberbond CB.

## **Consistent. Compatible. Customizable.**

H.B. Fuller is committed to continually improving the quality and reliability of medical devices through their high-performance, engineered adhesives brand, Cyberbond CB. Our innovative, high-performance cyanoacrylates and UV curable adhesives have set the quality standard for this industry for over two decades. Our goal in the medical industry is to impact people's lives by helping our customers deliver excellent product performance to ensure both patients and medical professionals have a great experience every time.

### **CONSISTENT**



#### **ISO 13485 CERTIFICATION PUTS US AT THE TOP OF THE CLASS**

Medical manufacturers rely on their suppliers for consistent and reliable materials. At H.B. Fuller, we know that adhesive failure in a medical device could mean the difference between life and death. Our U.S. manufacturing facility is ISO 13485 certified, ensuring that our products are made consistently – the same way, every time – and that they will conform to international standards. In order to maintain the highest industry standards, we are committed to maintaining this top-notch quality certification.

### **COMPATIBLE**



#### **ISO 10993 BIOCOMPATIBILITY IS OUR STANDARD**

We do our homework to accelerate your development cycle. Our medical-grade adhesives have passed ISO 10993 certification for cytotoxicity and, based on application, many of them have also passed ISO 10993 for skin irritation and skin sensitization testing. H.B. Fuller's biocompatible adhesives provide confidence that your device will stand up to rigorous industry testing.

### **CUSTOMIZABLE**



#### **CUSTOMIZED FORMULATIONS**

Developing custom adhesive solutions to meet device manufacturers' specific needs is in the DNA of H.B. Fuller. Our extensive ISO 10993-compliant adhesives illustrate our proven expertise in the medical device market. For more unique applications, our experience also gives us the ability to create custom formulas based on application-specific needs. Our size, responsiveness and expertise has allowed us to provide customer-specific solutions with a wide range of requirements. For new formulations, ISO 10993-5 cytotoxicity testing can be completed in four weeks upon customer approval.

### STRONG PERFORMANCE AND STERILIZATION RESISTANCE

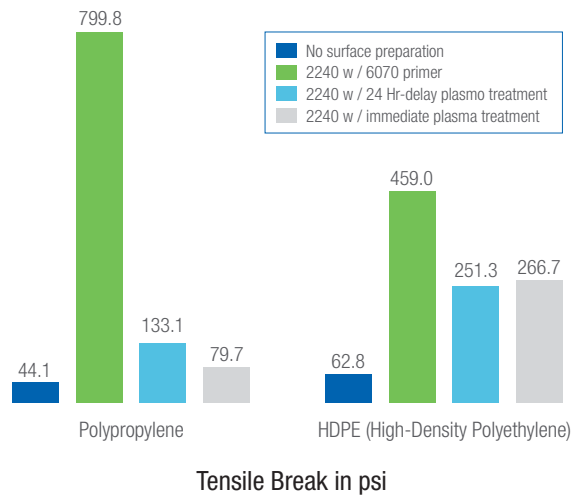
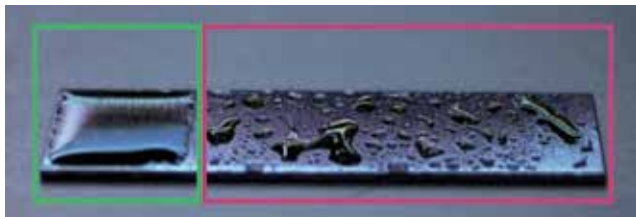
Performance is key in medical device assembly and our adhesive provide fast, strong and solvent-free bonding. Cyanoacrylates and UV-curable adhesives cure in seconds, result in a tack-free bond allowing our adhesives to also be used as coatings. Our adhesives stand up to the rigors of sterilization such as EtO and gamma. For multi-use devices that are typically resterilized by autoclave, we leverage our epoxy technology.

STERILIZATION RESISTANCE			
Sterilization Type	Cyanoacrylates	UV Curables	Epoxies
Ethylene Oxide (ETO)	High	High	High
Gamma Radiation	High	High	High
Steam Autoclave	Low	Medium	High
Repeated Sterilization	Low	Low	High

### LOW SURFACE ENERGY SUBSTRATES

The focus in the medical device market has shifted towards sourcing low-surface energy materials such as polypropylene, polyethylene, and polyether block amide (PEBA), to name a few. Bonding to these types of materials becomes increasingly more difficult as obtaining proper adhesive wet-out becomes a challenge. Our medical-grade primer increases the surface energy of these substrates, ultimately improving the adhesion, and, in some cases, has seen bond strengths increase nearly twenty times when coupled with our 6070 primer. H.B. Fuller works with our medical device customers, by leveraging surface treatments and customized formulations, to achieve a reliable between challenging substrates.

The picture below illustrates the difference between proper wetting (using 6070 primer on the left) and undesirable beading (untreated on the right). The graph on the right contrasts the ability of two different surface preparations, primer application and plasma treatment to promote adhesion on PP and HDPE.



### TRAINING SERVICES

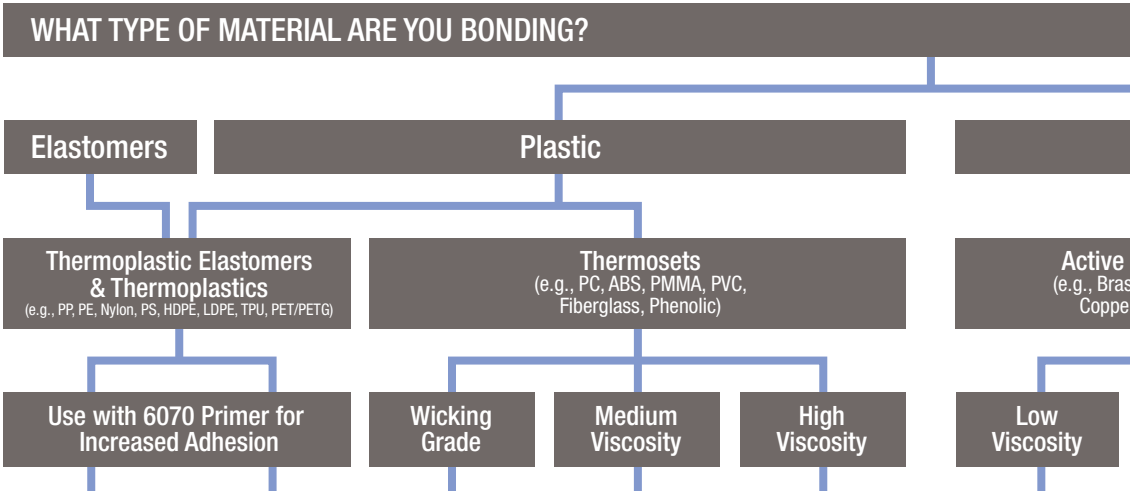
We are proud to offer training at our facility, or on-site at customer locations. Our trained technical specialists welcome the opportunity to meet with you and your team to provide an in-depth understanding of how H.B. Fuller adhesive solutions will enhance the quality and integrity of your next medical device.



# Solution Guide MEDICAL-APPROVED CYANOACRYLATES

As an ISO 13485-certified company, we understand the importance of providing reliable and consistent adhesives, along with unparalleled quality and service. In addition to our customized adhesive solutions, the ISO 10993-5-certified products below are merely an example of our capabilities and commitment to servicing your next medical device application.

## START



## SOLUTION

	6070	2611	2000W	2075	2400	2003
Viscosity (cPs)	1	105	3	750	3500	50
Shear Strength (psi)	–	4035*	2700**	3320*	3320*	2920***
Temperature Range	–	-67°F to 203°F	-67°F to 203°F	-67°F to 203°F	-67°F to 203°F	-67°F to 203°F
Fixture Time (seconds)	–	10	2	10	15	10

## DESCRIPTION

\* Performance of cured adhesive on Polycarbonate, tested to ASTM 4501

\*\* Performance of cured adhesive on PETG, tested to ASTM 4501

\*\*\* Performance of cured adhesive on Stainless Steel

Fixture time given is for the recommended substrate field (i.e. time for plastic recommendations are for plastic, metal are metal, and all speciality adhesives are shown for fixture time on metal.

### Cyberbond 6070 MEDICAL PRIMER

Cyberbond 6070 primer strengthens the adhesion of Cyberbond adhesives to polyolefins and other low energy plastics. It also increases the bonding ability of other difficult substrates such as silicone rubber. 6070 can be applied to surfaces by wiping, brushing, or spraying and contains no chlorinated or fluorinated solvents.

### Cyberbond 2611 INSTANT ADHESIVE

Cyberbond 2611 is a fast setting, low- to medium-viscosity cyanoacrylate adhesive for use on all types of substrates. It is engineered to adhere rapidly to inactive surfaces such as polypropylene and polyethylene. 2611 offers viscosity and flow characteristics that are ideal for filling small gaps.

### Cyberbond 2000W INSTANT ADHESIVE

Cyberbond 2000W is a low-viscosity cyanoacrylate adhesive. It is fast setting and ideal for wicking applications for bonding preassembled parts. 2000W also works well for bonding rubber materials.

### Cyberbond 2075 INSTANT ADHESIVE

Cyberbond 2075 is a medium-viscosity cyanoacrylate designed for general purpose bonding of various plastics, metals, and rubbers. It is also well suited for applications where gap filling is required.

### Cyberbond 2400 INSTANT ADHESIVE

Cyberbond 2400 is a high-viscosity cyanoacrylate adhesive engineered for a wide platform of applications. It offers maximum gap filling characteristics and extended repositioning time.

### Cyberbond 2003 INSTANT ADHESIVE

Cyberbond 2003 is a low-viscosity cyanoacrylate adhesive suitable for general purpose applications on a wide variety of plastics, metals, and rubbers.



Metal		
Metals (e.g., Brass, Bronze, Copper, Steel)	Inactive Metals (e.g., Nitinol, Aluminum, Nickel, Stainless Steel, Titanium, Anodized Surfaces)	
High Viscosity	Low Viscosity	High Viscosity
<b>2999</b>	<b>2010</b>	<b>2240-50</b>
Gel	110	4750
2730***	2920***	3500***
-67°F to 203°F	-67°F to 203°F	-67°F to 266°F
50	20	45

## SPECIALTY APPLICATION ADHESIVES

**Rubber-Toughened Cyanoacrylates**  
 Engineered for applications requiring vibration, shock, impact and/or heat resistance, as well as increased flexibility

**Low Odor, Low Bloom**  
 For applications with aesthetic or fume requirements

Low Viscosity	High Viscosity
<b>2240-05</b>	<b>2240</b>
500	2500
5200***	5200***
-67°F to 266°F	-67°F to 284°F
25	30

Low Viscosity	High Viscosity
<b>5005</b>	<b>5100</b>
5	1000
2600***	2600***
-67°F to 203°F	-67°F to 203°F
15	60

**Cyberbond 2999**  
INSTANT ADHESIVE

Cyberbond 2999 is a high-viscosity, gel cyanoacrylate adhesive ideal for bonding a wide variety of plastics, metals, and rubbers. It is also well suited for bonding porous materials or when adhesive flow is critical. 2999 offers maximum gap filling and repositioning time.

**Cyberbond 2010**  
INSTANT ADHESIVE

Cyberbond 2010 is an ethyl-based cyanoacrylate with low-to medium-viscosity that bonds exceptionally well to various metals, as well as plastics and rubbers alike. It is well suited for general purpose applications and is also approved for medical devices.

**Cyberbond 2240-50**  
INSTANT ADHESIVE

Cyberbond 2240-50 is a high-viscosity, rubber-toughened ethyl cyanoacrylate adhesive with excellent adhesion to a wide variety of plastics, metals, and rubbers. It also provides superior shock and thermo resistance, making it more resilient in the harshest of environments, as well as increased flexibility where many other cyanoacrylates tend to be brittle.

**Cyberbond 2240-05**  
INSTANT ADHESIVE

Cyberbond 2240-05 is a low- to medium-viscosity, rubber-toughened ethyl cyanoacrylate adhesive. It provides superior shock and thermo resistance, making it more resilient in the harshest of environments. 2240-05 also provides increased flexibility where many other cyanoacrylates tend to be brittle.

**Cyberbond 2240**  
INSTANT ADHESIVE

Cyberbond 2240 is a high-viscosity, rubber-toughened ethyl cyanoacrylate adhesive. It provides superior shock and thermo resistance, making it more resilient in the harshest of environments. 2240 also provides increased flexibility where many other cyanoacrylates tend to be brittle.

**Cyberbond 5005**  
INSTANT ADHESIVE

Cyberbond 5005 is an ethoxyethyl-based, cyanoacrylate adhesive with low-viscosity. Its low odor and low blooming characteristics make it well suited for applications where aesthetics and/or vapor control are critical.

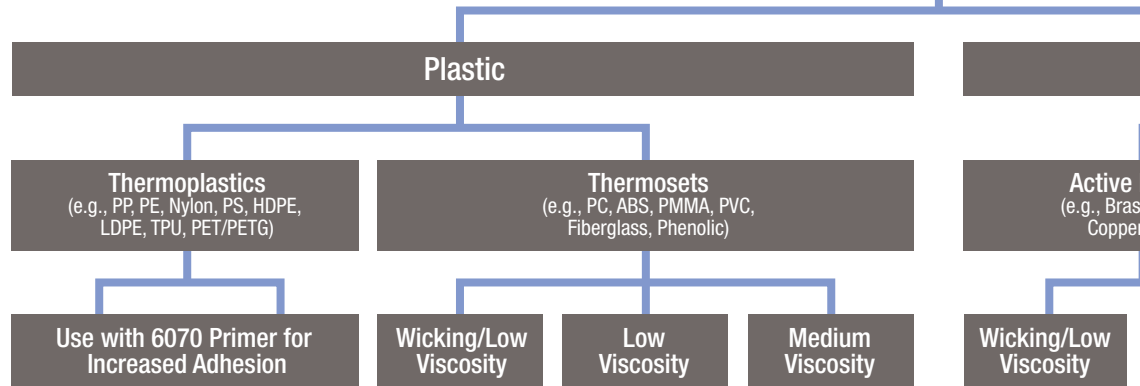
**Cyberbond 5100**  
INSTANT ADHESIVE

Cyberbond 5100 is an ethoxyethyl-based, cyanoacrylate adhesive with high viscosity. Its low odor and low blooming characteristics make it well suited for applications where aesthetics and/or vapor control are critical.

# Solution Guide MEDICAL-APPROVED UV CURE ADHESIVES

## START

### WHAT TYPE OF MATERIAL ARE YOU BONDING?



## SOLUTION

	6070	U304	U301	U302	U309	U301
Viscosity (cPs)	1	1000	40	250	1200	40
Shear Strength (psi)	–	3000*	3000*	3000*	3000*	500**
Temperature Range	–	-65°F to 200°F	-65°F to 200°F	-65°F to 200°F	-65°F to 200°F	-65°F to 200°F
Elongation (%)	–	175	150	200	150	150

## DESCRIPTION

### Cyberbond 6070 MEDICAL PRIMER

Cyberbond 6070 primer strengthens the adhesion of cyberbond adhesives to polyolefins and other low energy plastics. It also increases the bonding ability of other difficult substrates such as silicone rubber. 6070 can be applied to surfaces by wiping, brushing, or spraying, and contains no chlorinated or fluorinated solvents.

### Cyberbond U304 UV CURE ADHESIVE

Cyberbond U304 is a medium- to high-viscosity, light-cure adhesive engineered for bonding a wide variety of plastics in multiple configurations. When coupled with Cyberbond 6070 Medical Primer, U304 bonds well to dissimilar substrates and has high performance on low surface energy plastics. It also contains a UV tracer for quality inspection.

### Cyberbond U301 UV CURE ADHESIVE

Cyberbond U301 is a low-viscosity, light-cure adhesive with versatile bonding characteristics. Its wicking viscosity makes it ideal for needle bonding and has high performance on plastics, metals, and glass.

### Cyberbond U302 UV CURE ADHESIVE

Cyberbond U302 is a low- to medium-viscosity, light-cure adhesive engineered to bond well to various plastics, glass, and ceramics. It offers some impact resistance on both similar and dissimilar substrates and has particularly high performance on polycarbonate.

### Cyberbond U309 UV CURE ADHESIVE

Cyberbond U309 is a medium- to high-viscosity, light-cure adhesive engineered for bonding a wide variety of plastics. It bonds particularly well to both polycarbonate and acrylic and is versatile in bonding other materials.

### Cyberbond U301 UV CURE ADHESIVE

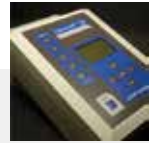
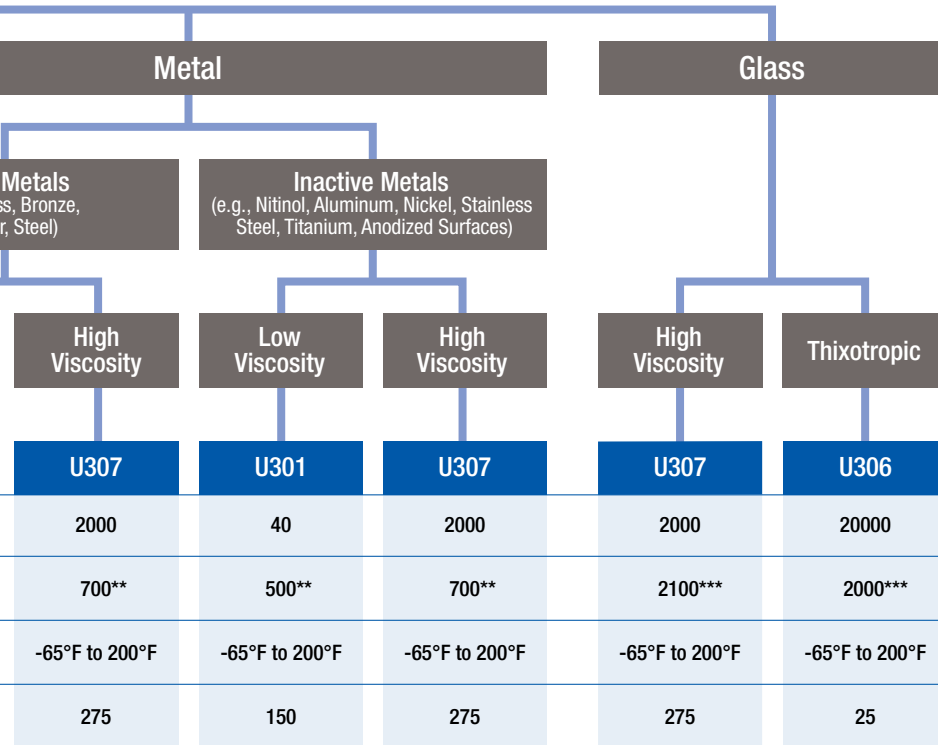
Cyberbond U301 is a low-viscosity, light-cure adhesive with versatile bonding characteristics. Its wicking viscosity makes it ideal for needle bonding and has high performance on plastics, metals, and glass.

\* Performance of cured adhesive on Polycarbonate

\*\* Performance of cured adhesive on Stainless Steel

\*\*\* Performance of cured adhesive on Glass

## ULTRAVIOLET LED CURING EQUIPMENT



### LINOP 500

LINOP 500 is a state-of-the-art, microprocessor-controlled, led curing device engineered to optimize efficiency with Cyberbond light-cure adhesives. This expandable unit will support different configurations of Cyberlite spotlamps and allow for expansion as your UV curing needs continue to grow.



### CYBERLITE 50S

Cyberlite 50S is a high-intensity, led spotlamp with 4- aspheric lenses. With 40 watts of power, and a wavelength of 395nm, Cyberlite 50S is engineered to cure Cyberbond light-cure adhesives in seconds. It is also expandable to 15 spotlamps on one LINOP 500 power system, replacing the need for floodlamps.



### CYBERLITE 4S

Cyberlite 4S is a strong-focus, LED spotlamp excellent for curing UV adhesives on catheters, needles, airways masks, and other medical devices. Targeted a 395nm, Cyberlite 4S optimizes intensity and cures Cyberbond light-cure adhesives in seconds. It has a bulb life of over 10,000 on-hours, and doesn't degrade over time.

#### Cyberbond U307 UV CURE ADHESIVE

Cyberbond U307 is a medium- to high-viscosity, light-cure adhesive that bonds extremely well to plastics, metals, and glass. It is versatile and suitable for use in a broad spectrum of UV cure applications, providing a tough yet flexible bond.

#### Cyberbond U301 UV CURE ADHESIVE

Cyberbond U301 is a low-viscosity, light-cure adhesive with versatile bonding characteristics. Its wicking viscosity makes it ideal for needle bonding and has high performance on plastics, metals, and glass.

#### Cyberbond U307 UV CURE ADHESIVE

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#### Cyberbond U306 UV CURE ADHESIVE

Cyberbond U306 is a thixotropic, medical-grade, light-cure adhesive that bonds extremely well to glass, metal, and a wide variety of plastics. It combines high viscosity and hardness, making it an ideal product for potting as well.





## ABOUT H.B. FULLER

Since 1887, H.B. Fuller has been a leading global adhesives provider focusing on perfecting adhesives, sealants and other specialty chemical products to improve products and lives. With fiscal 2017 net revenue of over \$2.3 billion, H.B. Fuller's commitment to innovation brings together people, products and processes that answer and solve some of the world's biggest challenges. Our reliable, responsive service creates lasting, rewarding connections with customers in electronics, disposable hygiene, medical, transportation, aerospace, clean energy, packaging, construction, woodworking, general industries and other consumer businesses. And, our promise to our people connects them with opportunities to innovate and thrive. For more information, visit us at [www.hbfuller.com](http://www.hbfuller.com).



For more information about H.B. Fuller Engineering Adhesives, visit [www.hbfullerengineering.com](http://www.hbfullerengineering.com).

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IMPORTANT: It is the user's responsibility to test and determine the suitability of a product for the user's intended use. Any product samples provided for testing are provided in accordance with standard limited warranties as stated on our technical data sheets.

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