

BIOCOMPATIBLE ADHESIVES FOR MEDICAL DEVICES

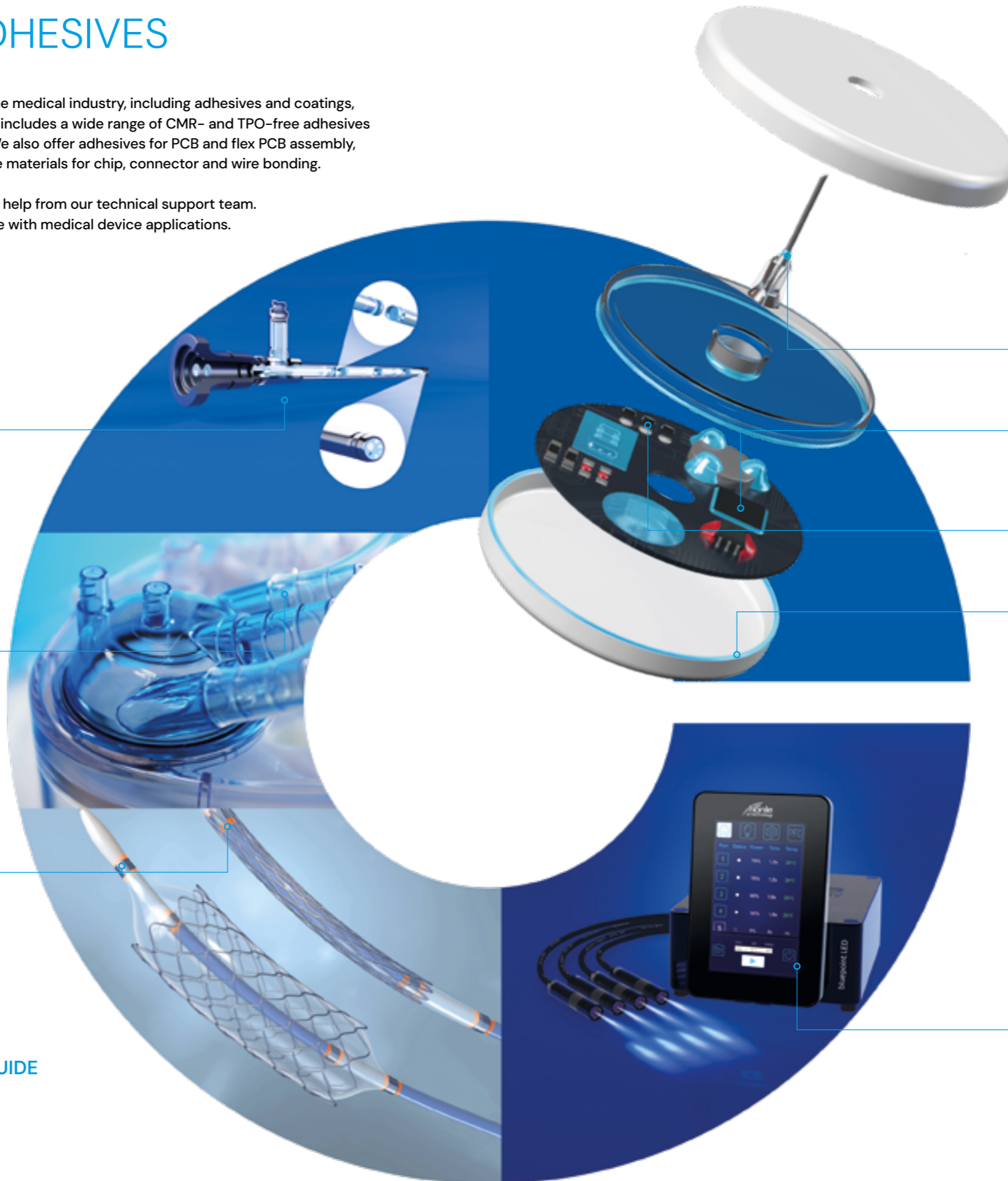


System solutions: CMR- and TPO-free adhesives
in compliance with USP Class VI and/or ISO-10993,
together with aligned UV curing equipment

MEDICAL GRADE ADHESIVES

Hoenle provides comprehensive processing solutions for the medical industry, including adhesives and coatings, as well as UV- and LED-UV curing equipment. Our portfolio includes a wide range of CMR- and TPO-free adhesives for needle bonding and the assembly of plastic housings. We also offer adhesives for PCB and flex PCB assembly, including encapsulants, protective coatings and conductive materials for chip, connector and wire bonding.

Find the right adhesives for your entire medical device with help from our technical support team. They possess an incredible amount of hands-on experience with medical device applications.



LENS BONDING AND STACKING FOR ENDOSCOPE
more information on page 4

TUBE AND CONNECTOR BONDING
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CATHETERS | TUBES | DIAGNOSTICS
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MEDICAL GRADE ADHESIVES SELECTION GUIDE
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WEARABLES & MEDICAL DEVICES

Hoenle offers complete adhesive and curing solutions for structural housing bonding, needle bonding or bonding to PCBs in medical wearables or other medical electronic devices.
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NEEDLE BONDING
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ELECTRONIC PACKAGING SENSORS
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CONDUCTIVE BONDING
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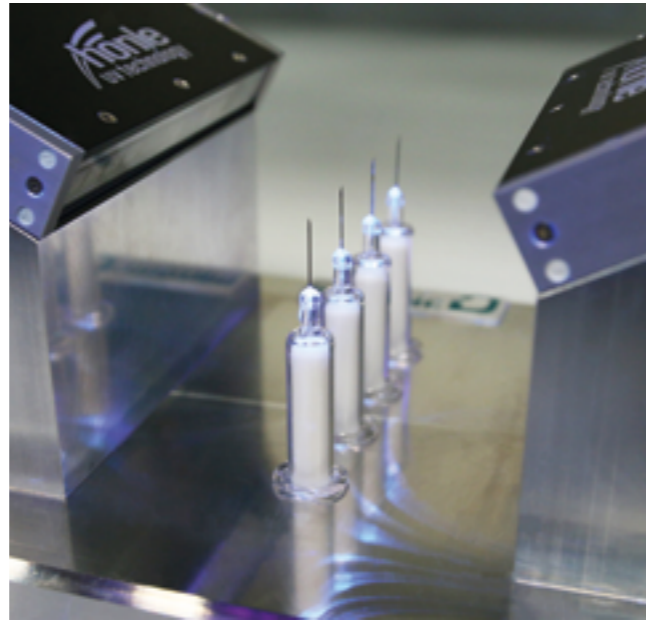
PLASTIC BONDING
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UV CURING EQUIPMENT
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APPLICATIONS IN DETAIL

NEEDLE BONDING

UV adhesives for bonding stainless steel needles or cannulas in glass or plastic syringes are solvent-free and fluorescent for a better process control. Suitable for USP Class VI and/or ISO 10993 certification, they offer the ability to bond PC, PVC, PP or ABS to stainless steel and other metals. Fully cured, they withstand high needlepull-out forces even after several sterilization cycles. UV blocked plastics can still be bonded and cured with long-wave light.



TUBE AND CONNECTOR BONDING

Vitralit® UV- and LED-UV-curing acrylate-based adhesives are suitable for connecting infusion lines or catheter tubing to stopcock valves, filters and adapters. They enable fast cycle times and process-reliable production. They are biocompatible and extremely resistant to chemicals and liquids. Depending on the application, they can be adjusted in viscosity to meet the required flexibility or strength for reliable bonding.



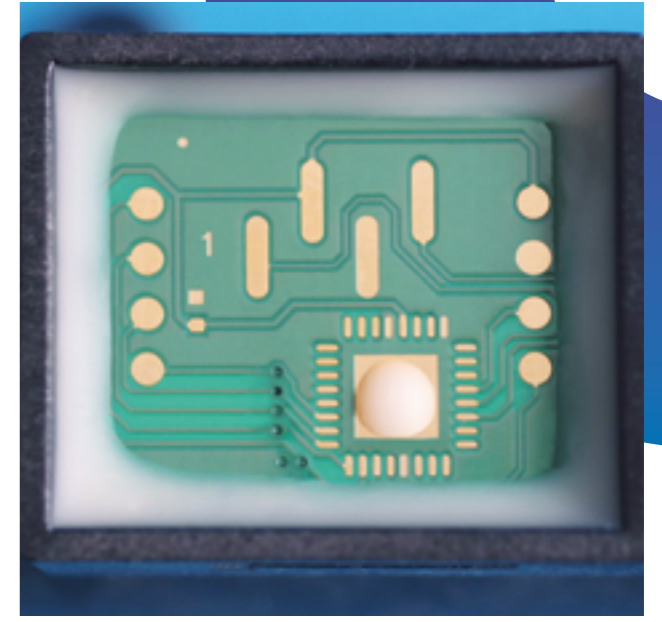
LENS BONDING AND STACKING FOR ENDOSCOPES

Dual curing Vitralit® adhesives are ideal for bonding lens stacks as well as attaching glass and rod lenses in endoscopes. High strength bonds are formed between glass and metal components that offer biocompatibility, good chemical resistance, and minimal shrinkage. Their high glass transition temperatures ensure operating stability and reliability. These adhesives are compatible with all common sterilization processes.



ELECTRONIC PACKAGING/SENSORS

Adhesives for sensors in medical technology are used for environmental protection, shielding, electrical connection and heat dissipation. These products meet ISO 10993 and/or USP Class IV standards, are solvent-free and withstand common sterilization processes. Vitralit® adhesives can be cured with UV or visible light for a precise, process-reliable and fast production. Shadowed areas of components can be safely cured with dual-cure adhesives.



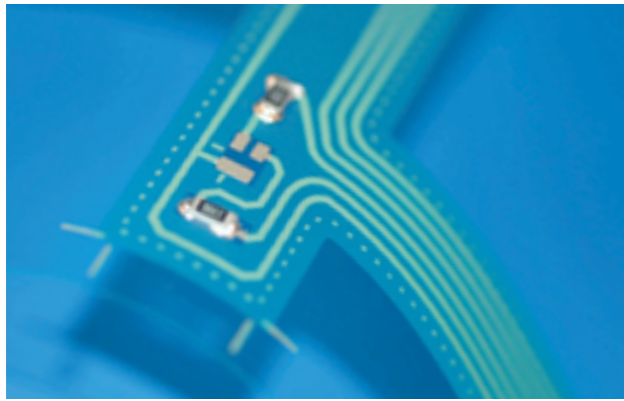
PLASTIC BONDING

For bonding and sealing transparent polycarbonate or acrylic housing halves, such as dialysis filters or blood oxygenators, Hoenle offers Vitralit® brand light-curing one component adhesives. Multiple viscosity ranges are available to fill the smallest channels as well as larger bond line gaps. Components are joined within seconds using LED-UV or LED visible light curing systems. Structuralit® 2-component adhesives are suitable for materials not transparent to UV and visible light. All adhesives are solvent-free and compatible with gamma, EtO and e-beam sterilization processes.

CATHETERS | TUBES | DIAGNOSTICS

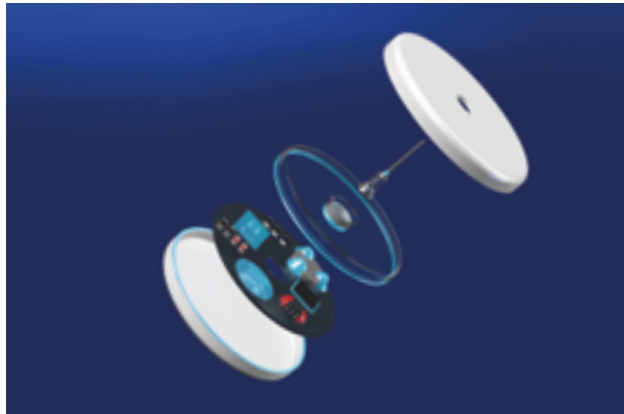
Bonding of respiratory materials, catheters and other diagnostic products can be accomplished quickly and reliably using UV adhesives from Hoenle. The adhesives meet the requirements of ISO 10993 and/or USP Class VI and bond not only the common plastics such as polycarbonate, PVC or ABS, but also substrates that are difficult to bond, including PEEK, PE and PP. They are solvent-free and highly resistant to moisture. Due to the products fluorescing under UV light, fast, efficient and cost-saving assembly processes can be realized.





CONDUCTIVE BONDING

Elecolit® electrically conductive adhesives are a suitable alternative to soldering processes. Their lower curing temperatures permit these conductive adhesives to be used for attaching temperature-sensitive chips and flexible conductors. In addition to forming electrical connections these mostly silver-filled adhesives offer heat dissipation, which reduces thermal stress on electronic components.



WEARABLES

Hoenles broad line of medical device adhesives enables manufacturers to select the exact adhesive properties required for their designs. For medical wearables, Panacol provides solutions for the complete device, including needle bonding, SMD packaging, protective coating, and housing assembly. Devices such as glucose monitors can be assembled quickly and reliably in high volume production processes. Our experienced technical team is ready to assist with recommendations for adhesives, curing systems, and dispensing options.

Adhesion properties of adhesives on different substrates												
Adhesive	Structalite® 8801	Vitrilit®										
		1605	1655	1702	UD 6572	E- 4731 /F/T	UV E- 4050	E- 5140 /VT F	UV E- 7030 /LV	E- 7041 (F)/T	E- 7090 VHS F	E- 7311 FO/T
Substrate												
ABS	●	●	●	●		●	●	●	●	●	●	●
Aluminium	●		●		●	●	●	●	●			●
Stainl. Steel	●	●	●		●	●	●	●	●	●	●	●
Glass	●	●	●	●	●	●	●	●	●	●	●	●
PA6	●	●	●	●	●	●	●	●	●	●	●	●
PC	●	●	●	●	●	●	●	●	●	●	●	●
PEEK	●	●	●	●	●	●	●	●	●	●	●	●
PET-A	●	●	●	●	●	●	●	●	●	●	●	●
PMMA	●	●	●	●	●	●	●	●	●	●	●	●
PS	●	●	●	●	●	●	●	●	●	●	●	●
PU/PUR		●		●				●	●	●	●	●
PVC	●	●	●	●	●	●	●	●	●	●	●	●
SAN	●	●	●	●		●	●	●	●	●	●	●
PP/PE	Surface treatment recommended											
Silicone	Surface treatment recommended											

● very good ● application-related

MEDICAL GRADE ADHESIVES SELECTION GUIDE

Adhesive	Base	Viscosity [mPas]	Curing*	Compliance	Color	Characteristics
Vitrilit® 1605	1-part epoxy	200 - 400 LVT, Sp. 2/30 rpm	UV/thermal	ISO 10993-5	Transparent	Low shrinkage, low CTE, high glass transition temperature, excellent chemical resistance, dual cure
Vitrilit® 1655	1-part epoxy	150 - 300 LVT, Sp. 2/30 rpm	UV/thermal	USP Class VI ISO 10993-5	Transparent	Flexible, low viscosity, excellent adhesion to plastics and metals, dual cure, resistant to sterilization
Vitrilit® 1702	Acrylate	10 - 100 LVT, Sp. 2/60 rpm	UV	USP Class VI	Transparent, slightly yellow	High adhesion to plastics, capillary flow, high E-modulus, high material strength, low oxygen inhibition, perfect solution for bonding hose connections, back-pressure valves or blood filters
Vitrilit® 1703	Acrylate	85,000 - 130,000 LVT, Sp. 4/3 rpm	UV/VIS	USP Class VI	Transparent, slightly yellow	Excellent adhesion to plastics, gap-filling, high E-modulus, specially formulated to bond hose connections, back-pressure valves and blood filters, shape retaining, shear thinning
Vitrilit® E-4731 Vitrilit® E-4731 F	Acrylate	900 - 1,200 Rheometer, 10s ⁻¹	UV/VIS	ISO 10993-5	Transparent	Flexible, excellent adhesion to glass and plastics, dry surface
Vitrilit® E-4731 T		2,000 - 5,000 Rheometer, 10s ⁻¹				
Vitrilit® E-5140 Vitrilit® E-5140/VT F	Acrylate	2,100	UV/VIS	ISO 10993-5	Transparent slightly yellow	Soft, flexible with dry surface cure, excellent resistance to thermal cycling, used in tube sets and breathing circuits or as coatings of electronic devices
Vitrilit® E-5140		11,000 Rheometer, 10s ⁻¹				
Vitrilit® E-7041 (F) Vitrilit® E-7041 (F)T	Acrylate	70	UV/VIS	ISO 10993-5	Transparent, slightly yellow	Capillary flow, very good adhesion to many plastics, suitable for needle bonding and joining connectors/tubes/housings or dialysis filters, fluorescent markers for in-line inspection
Vitrilit® E-7041 (F)		2,200 Rheometer, 10s ⁻¹				
Vitrilit® E-7090 VHS F	Acrylate	50 Rheometer, 10s ⁻¹	UV/VIS	ISO 10993-5	Transparent, slightly yellow	Capillary flow, very high adhesion to plastics, very fast curing at low intensities, high crosslinking. Well suited for sealing hollow fiber filters, needles and endoscopes
Vitrilit® E-7311 (FO) Vitrilit® E-7311 (FO) T	Acrylate	85	UV/VIS	ISO 10993-5	Transparent	Very good adhesion to many plastics, available in various viscosities, creates high strength bonds in the assembly of tube sets, connectors and housings, all adhesive variations are also available with orange fluorescence (FO)
Vitrilit® E-7311 (FO)		2,200 Rheometer, 10s ⁻¹				
Vitrilit® UD 6572	Epoxy-acrylate	23,000-33,000 Rheometer, 10s ⁻¹	UV/VIS/thermal	ISO 10993-5	Black	Endoscope/Lens-Bonding, protection of sensitive parts from mechanical and natural stress, UV-prefixation, secondary heat cure necessary
Vitrilit® UV E-4050	Acrylate	170 Rheometer, 10s ⁻¹	UV/VIS	ISO 10993-5	Transparent, slightly yellow	Very good adhesion to many plastics, glass and metal, specially formulated for bonding needles, impact resistant
Vitrilit® UV E-7030 Vitrilit® UV E-7030/LV	Acrylate	20,000	UV/VIS	ISO 10993-5	Transparent	Flexible, high elongation at break, good shear strength, bonding plastics with low surface energy. Dry surface after UV-curing
Vitrilit® UV E-7030		720 Rheometer, 10s ⁻¹				
Vitrilit® MASK E-20102 G	Urethane acrylate	8,000-15,000 Rheometer, 10s ⁻¹	UV/VIS	ISO 10993-5	Translucent, green	Masking, protective coating of highly polished surfaces, orthopedic implants, removable with hot water at 80°C
Structalite® 5893	1-part epoxy	6,000 - 10,000 Rheometer, 10s ⁻¹	thermal	ISO 10993-5	Black	Fast curing at low temperatures, good shock resistance, specially formulated to bond medical disposables
Structalite® 8801	1-part epoxy	30,000 - 45,000 LVT, Sp. 4/6 rpm	thermal	ISO 10993-5	Beige	Suited for encapsulation of electronic devices and for potting of sensors, very good oil- and media resistance, low ion content, solvent free
Elecolit® 323	2-part-epoxy	Paste-like	thermal	ISO 10993-5/-12	Grey	Thermally and electrically conductive, solvent-free, suitable for semiconductors (Na+, K+, Cl- <10ppm), autoclavable (1000h)
Cyanolit® 203 TX	Cyano-acrylate	5,000 - 1,000 LVT, Sp. 3/6 rpm	RT	USP Class VI	Transparent	Gap-filling, high adhesion to plastics (PA, PC, ABS, PVC, EPDM), metal and elastomers, ideally suited for bonding of hose connections and porous substrates, resistant to moisture, shear thinning
Cyanolit® 241 F	Cyano-acrylate	30 - 50	RT	USP Class VI	Transparent	Capillary flow, very good wetting properties, ideally suited for bonding of plastics (PVC, PMMA), copper, aluminum and steel
Cyanolit® 290 WR	Cyano-acrylate	400 LVT, Sp. 2/60 rpm	RT	ISO 10993-5	Transparent	Water resistant, fast curing, good adhesion to plastic and metal
Cyanolit® 732 F	Cyano-acrylate	230 - 350 LVT, Sp. 2/60 rpm	RT	USP Class VI	Transparent	Short curing time, wide range of applications, very good adhesion to plastics (PVC, PMMA, ABS, EPDM) & stainless steel, film-forming

*UV = 320 - 390 nm, VIS = 405 nm

UV CURING SYSTEMS

Hoenle offers a broad range of UV curing equipment for curing UV adhesives, which are perfectly aligned in terms of wavelength. Our sales engineers and application technicians will assist you in selecting the right UV Equipment in combination with the appropriate adhesive. Thanks to our extensive experience in both areas, we can offer you a system solution that is perfectly tailored to your individual requirements, ensuring maximum productivity and efficiency in your bonding processes.

LED SPOTLIGHTS

High intensity small area UV irradiation

BLUEPOINT



LED LINE EMITTERS

High-power arrays with individual length

LED POWERLINE



LED FLOODLIGHTS

Homogeneous light distribution with high intensity

LED SPOT



LED CURING CHAMBER

Reliable protection against UV radiation

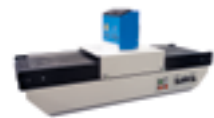
LED CUBE



LED CONVEYOR BELTS

Can be combined with LED Powerline or LED Spot for high output

CONVEY LED



UV-MEASUREMENT

Measurement of intensity and dose for reliable process monitoring

UV METER



UV Sources	Dimension in mm	Available Wavelength in nm	Intensity in W/cm ²	Cooling
LED Spotlights	Light emission up to Ø 20	365/385/405	up to 20.000	air-cooled
LED Line Emitters	Light emission width 10/20/40, length variable	365/385/395/405/460	up to 25.000	air and water-cooled
LED Floodlights	Light emission 20x20 / 40x40 / 100x100 / 200x50	365/385/395/405/460	up to 30.000	air and water-cooled
LED Curing Chambers	Inner dimension 180x180 / 350x350	365/385/395/405/460	up to 5.000	air-cooled
LED Conveyor Belts	Belt width 110 - 520	365/385/395/405/460	up to 25.000	air and water-cooled

Hoenle Adhesives GmbH
Stierstädter Straße 4
61449 Steinbach GERMANY

Phone: +49 6171 6202-0
adhesivesystems@hoenle.com



For regional sales and technical support, please refer to our global contact directory www.hoenle.com/contact