HERNON®
High Performance Adhesives and Sealants
ISO 9001 Registered

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Technical Data Sheet
Ultrabond® 787

Product Description

Hernon® Ultrabond® 787 is a one component, thixotropic adhesive, which cures when exposed to ultraviolet radiation and/or visible light of sufficient intensity.

Typical Applications

Ultrabond® 787 is primarily used for bonding rigid and flexible PVC to polycarbonate where large gap filling capabilities (0.25mm) and a flexible joint are desired. Its flexibility enhances the load bearing and shock absorbing characteristics of the bond area. It has also shown excellent adhesion to a wide variety of substrates including glass, many plastics and most metals.

Properties Of Uncured Material

Property	Value
Chemical Type	Acrylated Urethane
Appearance	Pale, yellow liquid
Specific Gravity @ 25°C	1.05
Viscosity @ 25°C, cP	5,000
Refractive Index, N_D	1.48
Flash Point	See MSDS

Stress Cracking

Ultrabond® 787 was applied to a polycarbonate bar 6.4 cm by 13mm by 3mm, which had been flexed to induce different stress levels. The time it took for signs of crazing or stress cracking to appear was recorded. Tested according to ASTM D3929.

Stress, N/mm² (psi)	Time, minutes
7 (1000)	> 15
12 (1750)	13-14

Typical Curing Performance

Ultrabond® 787 can be cured through irradiation with ultraviolet and/or visible light of sufficient intensity. To obtain full cure on surfaces exposed to air, the intensity of energy at 260 nm is particularly important. The cure rate and ultimate depth of cure will depend on light intensity, the spectral distribution of the light source, the exposure time and the light transmittance of the substrates.

Fixture Time

Fixture time is the time required for a 1cm lap joint of PVC and polycarbonate with 13mm overlap and 0.5mm gap to be irradiated with light energy so it has sufficient strength to support a 3 kg weight for 10 seconds.

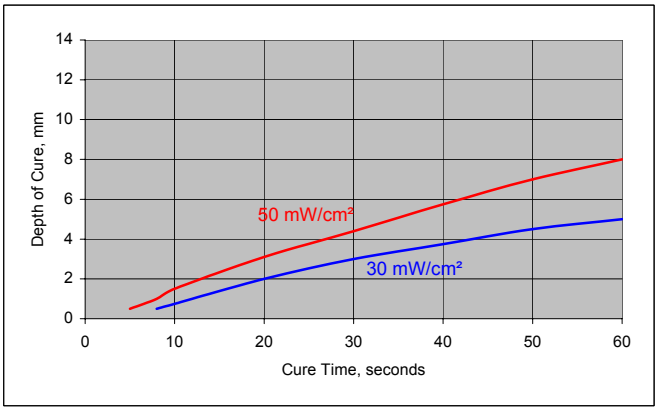
Lamp Type	Fixture Time, seconds @ 30 mW/cm²	Fixture Time, seconds @ 50 mW/cm²
Metal Halide	< 5	< 5
Fusion H & V Bulbs	-----	< 5
Fusion D Bulb	-----	< 5

Depth of Cure vs. UV Irradiance

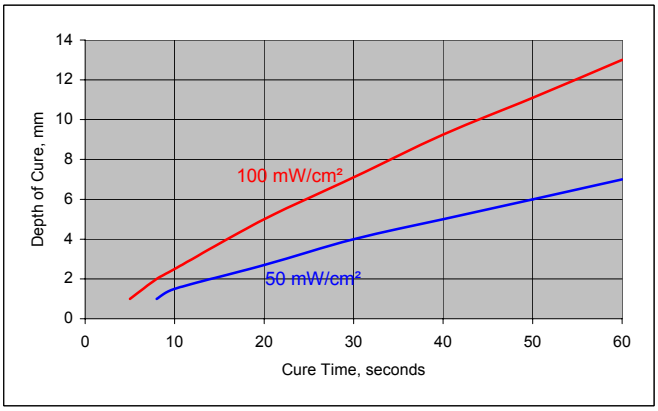
The graphs below show the increase in depth of cure with time at 30 mW/cm² – 100 mW/cm² (as measured from the thickness of the cured pellet formed in a 15mm diameter PTFE die.

When exposed to a V Bulb at irradiances of 50 and 100 mW/cm² for 30 seconds, a depth of cure greater than 13 mm was achieved. The performance for Medium Pressure Hg will be similar to Fusion H Bulb.

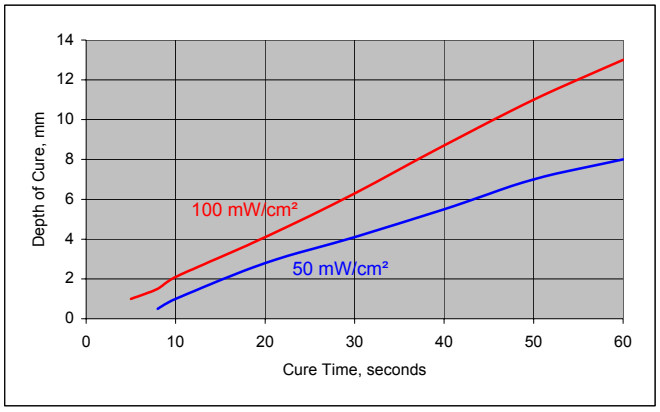
Bulb Type: Metal Halide (Doped)



Bulb Type: Fusion® D



Bulb Type: Fusion® H



Typical Properties Of Cured Material

Cured 80 seconds @ 30mW/cm² using a metal halide light source

Physical Properties

Property	Value
Tensile strength @ break, ASTM D882, psi	2700
Elongation @ break, ASTM D882, %	250
Tensile Modulus, ASTM D882, psi	37000
Hardness, ASTM D2240, Shore D	53
Water Absorption, ASTM D570 2 hrs in boiling water, %	3.18
Refractive Index, N_D	1.5027

Electrical Properties

Property		Value
Dielectric Strength, V/mil ASTM D149		665
Dielectric Constant @ ASTM D150	100 Hz 1 kHz 1 MHz	5.17 5.01 4.61
Dissipation Factor @ ASTM D150	100 Hz 1 kHz 1 MHz	0.0413 0.0204 0.0393
Volume Resistivity, Ω·cm ASTM D257		7.7×10^{14}
Surface Resistivity, Ω ASTM D257		9.2×10^{14}

Typical Cured Performance

Lap shear assemblies were cured for 80 seconds @ 30mW/cm² using a metal halide light source. Exposed to conditions indicated and tested at and tested 22ºC according to ASTM D3163. Shear strength values in psi.

Substrates Bonded	Initial RT	49ºC/Cond. Humidity 300 Hrs	49ºC/Cond. Humidity 500 Hrs
Polycarb to Etched Al	461	381	309
Polycarb to As Rec'd Al	417	192	74
Polycarb to Steel	409	491	389
Polycarb to Glass	605	755	757
Polycarb to Phenolic	743	724	827
Polycarb to Polycarbonate	3392	2229	1592
Polycarb to Epoxyglass	820	989	743
Polycarb to PVC	1296	1279	1053
Polycarb to ABS	2449	1328	1163
Polycarb to Acrylic	937	942	727
Polycarb to Nylon	493	393	71
Polycarb to Valox	829	624	498

Typical Environmental Resistance

Polycarbonate to Polycarbonate lap shear assemblies with 0.5 mm gap cured 80 seconds @ 30mW/cm² using a metal halide light source. Exposed to conditions indicated and tested at and tested 22ºC according to ASTM D3163.

Heat Aging

Temperature, ºC	% Initial strength retained 170 hr	% Initial strength retained 340 hr
71	100[1]	100[1]
93	100[1]	100[1]

[1] Substrate Failure

Chemical /Solvent Resistance

Solvent	Temp,ºC	% Initial strength retained 2 hr	24 hr	170 hr
Water	100	100[1]		
	49			100[1]
	87			95
Isopropyl Alcohol	22		100[1]	
Heat / Humidity	38			100[1]

[1] Substrate Failure

General Information

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Directions for Use

Ultrabond® 787 is UV sensitive. Exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling. Product should be dispensed from applicators with black feed lines. For best performance bond surfaces should be clean and free from grease. UV cure rate is dependent on lamp intensity, distance from light source, depth of cure needed or bondline gap and light transmittance of the substrate through which the radiation must pass.

Recommended irradiance at the bondline for curing is 5mW/cm² minimum with an exposure time of 4-5 times the fixture time at this same iirradiance. For dry curing of exposed surfaces higher UV irradiance is required (100 mW/cm² minimum).

Cooling should be provided for temperature sensitive substrates such as thermoplastics. Crystalline and semicrystalline thermoplastics should be checked for risk of stress cracking when exposed to liquid adhesive. Excess adhesive can be wiped away with organic solvent. Bonds should be allowed to cool before subjecting to any service loads.

Storage

Ultrabond® 787 should be stored in a cool, dry location in unopened containers at a temperature between 46ºF to 82ºF (8ºC to 28ºC) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused material, do not return any material to its original container.

Dispensing Equipment

Hernon® offers a complete line of semi and fully automated dispensing equipment. Contact **Hernon® Sales** for additional information.