

# HANAREY CSA4535 Product Data Sheet

Jan 2024

Hanarey CSA4535 is a comparatively high-viscosity adhesive for needle and syringe bonding. The product has passed the ISO 10993 biocompatibility series of tests. The product forms a flexible transparent layer upon exposure to UV and/or light. It has good adhesion ability to various substrates such as glass, plastic, and most metals. Its ability to UV cure tack free in seconds enables faster processing, greater output, and lower processing costs.

## UNCURED PROPERTIES \*

Property	Value	Test Method
Chemical Class	Acrylated Urethane	N/A
Appearance	Transparent Liquid	N/A
Density, g/ml	1.12	ASTM D1875
Viscosity, cP	8,000~14,000	ASTM D2556
Shelf Life from Date of Manufacture	180 Days	N/A

## CURED MECHANICAL PROPERTIES \*

Property	Value	Test Method
Hardness	D55	ASTM D2240
Tensile at Break, MPa	14.6	ASTM D638
Elongation at Break, %	131.8	ASTM D638
Modulus of Elasticity, MPa	153.4	ASTM D638
CTE $\alpha_1$ , $\mu\text{m}/\text{m}/^\circ\text{C}$	180.2	ASTM E831
CTE $\alpha_2$ , $\mu\text{m}/\text{m}/^\circ\text{C}$	268.9	ASTM E831

## OTHER CURED PROPERTIES \*

Property	Value	Test Method
Boiling Water Absorption, % (2 h)	0.03	ASTM D570
Water Absorption, % (25°C, 24 h)	0.01	ASTM D570
Linear Shrinkage, %	0.57	ASTM D2566
Glass Transition Tg, °C	71.3	ASTM D5418

## ADHESION \*

Substrate	Shear Strength #
PC / PC	26.5 MPa
PC / GL	6.2 MPa
PC / SS	7.3 MPa

\* Not Specifications

N/A Not Applicable

# Cured by Dymax 5000-EC (all spectrum), 120 mW/cm<sup>2</sup> intensity, 30 s

‡ HSTM refers to Hanarey Standard Test Method

## TRANSPORTATION, STORAGE, AND SHELF LIFE

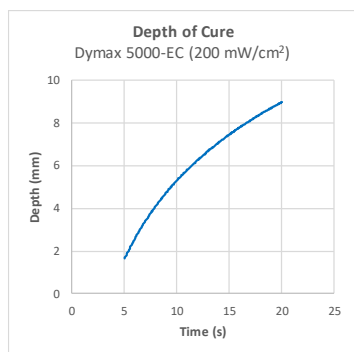
Do not crush and throw to avoid leakage during transportation. It is verified that the product's exposure to ambient temperature for a short time during transportation will not affect its performance. Store the material in a low-humidity, cool, and dark place when not in use. This product may polymerize upon prolonged exposure to ambient and artificial light as well as moisture. This material shelf life is noted on page 1 of this document when stored between 10°C (50°F) and 35°C (95°F) in the original, unopened container.

## CLEAN UP

Uncured Hanarey materials may be removed from dispensing components and parts with non-alcoholic solvents. Cured material will be impervious to many solvents and difficult to remove. Cleanup of cured material may require mechanical methods such as ultrasonic bath, water, jet, vacuum tweezers, air knife, and/or warming to aid in the removal.

## CURING GUIDELINES

The graph below shows the increase in depth of cure as a function of exposure time at Dymax 5000-EC 200 mW/cm<sup>2</sup>. These depths are only due to light cure.



Full cure is best determined empirically by curing at different times and intensities and measuring the corresponding change in cured properties such as tackiness, adhesion, hardness, etc. Full cure is defined as the point at which more energy exposure no longer improves cured properties. Higher intensities or longer cures (up to 5x) generally will not degrade Hanarey light-curable adhesives.

Hanarey recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for a full cure. Although Hanarey Application Engineering can provide technical support and assist with process development, each customer ultimately must determine and qualify the appropriate curing parameters required for their unique application.

## GENERAL INFORMATION

This product is intended for industrial use only. Keep out of the reach of children. Avoid breathing vapors. Avoid contact with skin, eyes, and clothing. Wear impervious gloves. Repeated or continuous skin contact with uncured material may cause irritation. Remove material from the skin with soap and water. Never use organic solvents to remove material from the skin and eyes. For more information on the safe handling of this material, please refer to the Safety Data Sheet before use.

The data provided in this document are based on historical testing that Hanarey performed under laboratory conditions as they existed at that time and are for informational purposes only. The data are neither specifications nor guarantees of future performance in a particular application. Hanarey does not guarantee that this product's properties are suitable for the user's intended purpose. The contents of this document are subject to change. Unless specifically agreed to in writing, Hanarey shall have no obligation to notify the user about any change to its content.

Data Collected: Dec 2023

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