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Technical Data | January 2024

3M™ UV Activated Film 81000 Series

Product Description

3M™ UV Activated Film 81000 series is a UV activated and curable film adhesive family. The film thicknesses offered are 10, 25, 50, 75, 100 micrometers. 3M UVAF film 81000 series is delivered between two polyester silicone release liners. Before UV activation, 3M UVAF film 81000 is stable and tacky at room temperature and can be easily converted into precision die cuts parts just like a pressure sensitive adhesive (PSA) transfer tape. Once activated with UV, the bond strength develops at room temperature, achieving green strength within an hour and semi-structural bond strength within 48 hrs. It can be used to bond most Medium and High Surface Energy materials.

Key Features

- Full bond develops at room temperature within 48 hours following UV activation
- Excellent bond strength to metal surfaces
- Bonds non-UV transparent substrates
- Bond develops with very low shrinkage
- Good bond line visual appearance
- Performs and processes like a PSA tape before UV activation
- Die-cuttable for thin precision bonding

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38 µm PET Release Liner
10, 25, 50, 75 and 100 µm
50 µm anti-static PET Release Liner

Material Description

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ UV Activated Film 81000 Series Property	Value
Adhesive Color	Clear, slightly yellow
Halogens (Cl^- and Br^-)	Compliant[1]

[1] Per IEC 61249-2-21

Typical Applications

- Electronics Component Bonding, such as
  - Camera
  - Speaker
  - Glass

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Typical Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the product's Certificate of Analysis (COA) that is shipped with the commercialized product once it is approved by 3M for general commercialization and development work is completed.

3M™ UV Activated Film 81000 Series						
Property	**Test Method**	**Caliper**				
UVAF Names		81010	81025	81050	81075	81100
Thickness	Caliper	10 μm (0.4 mil)	25 μm (1 mil)	50 μm (2 mil)	75 μm (3 mil)	100 μm (4 mil)
Overlap Shear fully cured* on Anodized Aluminum [MPa]	ASTM D1002	3.0	10.9	12.1	12.1	10.5
180° Peel Fresh RT 15 min SS [N/mm]	ASTM D3330	0.30	0.50	0.50	0.58	0.75
Storage Modulus G' fully cured [MPa]	DMA (1Hz, 5% strain, temperature ramp, 3°C/min)	1321				
Glass Transition Temperatures	DMA	-7°C (before cure) 44°C (after cure)				

*Curing condition: 3J/cm^2 at 365nm wavelength

Surface Preparation Prior to Bonding

A clean bonding surface is essential for maximum performance. For metals, chemical etching results in ultimate adhesion. Abrading the metal bonding surface with a 3M™ Scotch-Brite™ Pad, and cleaning with Methyl Ethyl Ketone (CAS# 78-93-3) will improve bond strength. For plastic bonding, cleaning the surface is recommended to remove oils, mold release agents, and solid contaminants prior to bonding. For preparing other substrates for bonding contact your 3M application or technical service engineer.

Pre-Bonding (Pre-Tacking) Recommendations

To pre-bond or pre-tack the adhesive to the first substrate, remove easy liner and place/align the adhesive film on the first substrate with the release liner out. Adhesion is formed by applying pressure using a press, roller, clamping or similar equipment at 25°C with ~15 PSi pressure. For rolling, 20N pressure at a speed of 300mm/min is recommended.

Bonding and Curing Recommendations

When you are ready to make the final bond, remove the release liner, or keep the release liner if it is clear, and expose the adhesive to UV light. We recommend a 365nm LED UV lamp or similar wavelength, 3J/cm^2 to activate UVAF. UV activation time needs to be adjusted based on different lamp intensity to achieve target dosage. Once UV triggered, **within 10 minutes** at 25°C, align and mate the first substrate with the second substrate. Clamp the substrates. Pressure will depend on joint design and part tolerance. Recommended starting pressure is 15PSi for 30 seconds. Adhesive will cure at RT and reach full state of cure at 24-48 hours. However, handling strength occurs after 30 minutes post UV activation. Optionally, to speed rate of cure, use a batch or continuous operation oven to reach an elevated adhesive temperature or use a hot bar heat sealer with pressure to achieve optimal bond strengths faster. Talk to your tech service representative for assistance with custom profiles.

Storage and Shelf Life

The shelf life of 3M™ UV Activated Film 81000 series is 18 months from date of manufacture when stored in the original light blocking packaging and stored between 16°C and 27°C, below 50% relative humidity.

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Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M specifications, test methods, and test results for the product's performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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