

# EPO-TEK® Specialty UV Curing Adhesives

**Epoxy-Based Systems  
&  
Acrylate-Based Systems**



**EPOXY  
\* TECHNOLOGY**

*Innovative Epoxy Adhesive Solutions for Over 45 Years™*

# What's Special About EPO-TEK® UV Curing Epoxies

## Epoxy-Based UV Benefits

### Excellent adhesion and reliability

- Due to the **epoxy backbone** (rather than acrylate backbone)

### Low shrinkage

- Average shrinkage is approximately 1-5% (acrylate is typically 10-15%)
- Low shrinkage leads to low internal stress aiding adhesion

### Not subject to oxygen inhibition

- Cationic photoinitiators are not quenched by oxygen

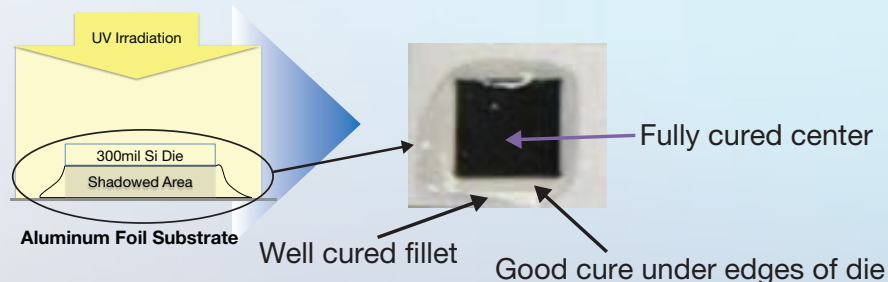
### Capable of “Dark” Cure

- Cation creates the “living polymer” and continues to be active in the absence of UV light
- Enables a small degree of curing in areas never seen by the UV light, for a limited distance

### Most are thermally post-curable

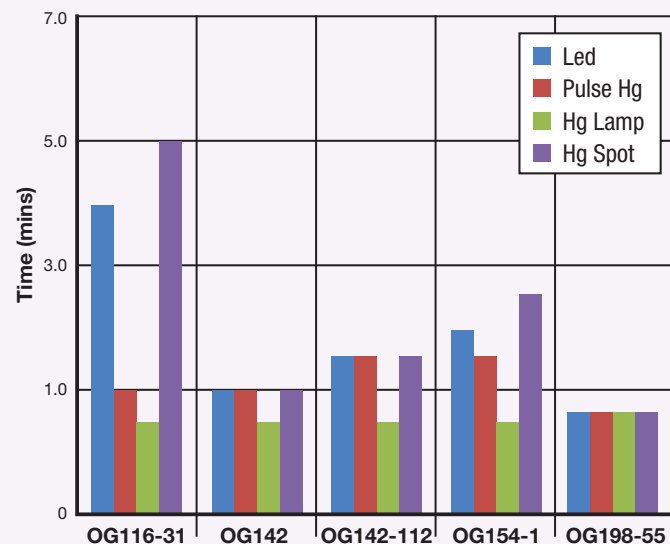
- Greater degree of conversion than UV cure alone (*Initial UV cure is required for best thermal post cure results*)

### Effect after UV cure with a thermal post cure on shadowed areas



*Shadow curing is often critical to designs where access to UV light is limited*

### Epoxy UVs can be cured in $\leq 1$ minute\*



For complete listing of UV products visit [EPO-TEK.com](http://EPO-TEK.com)

### \*With proper optimization through:

- UV lamp selection
- Using a UV source that generates heat
- Warming the formulation or substrate before application
- Down stream thermal curing following UV exposure-May also improve water resistance

# EPO-TEK® Specialty UV Curing Selector Guide

Epoxy-Based

Epoxy Technology Inc. offers an exclusive line of high performance UV curing epoxies.  
Our unique formulations provide superior performance.

## UV + Thermal Post Cure

For Enhanced Performance

| Product          | Viscosity<br>@ 23°C (cPs)     | Tg     | Hardness | Nd*    | Performance Features                                                                                           | Applications                                                        |
|------------------|-------------------------------|--------|----------|--------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>OG116</b>     | 88,979<br>@ 2.5rpm            | 146°C  | 88D      | 1.5892 | Higher viscosity version of OG116-31<br>High chemical resistance<br>High Tg & high index<br>Very high strength | Edge seal<br>Fiber optic assembly<br>Glob top                       |
| <b>OG116-31</b>  | 20,000 - 30,000<br>@ 10rpm    | >115°C | 83D      | 1.5842 | High chemical resistance<br>High Tg & high index<br>ISO 10993 compliant                                        | Fiber optic assembly<br>Gasket seal and glob top<br>Medical devices |
| <b>OG142-87</b>  | 250 - 600<br>@ 100rpm         | >100°C | 82D      | 1.5058 | Low viscosity<br>Excellent bond strength<br>Moisture resistance                                                | Fiber bundling/assembly<br>Glob top fill<br>Micromolded lens        |
| <b>OG142-95</b>  | 534<br>@ 100rpm               | >100°C | 82D      | 1.5123 | Low viscosity<br>Excellent bond strength<br>Moisture resistance                                                | Fiber optic assembly<br>Glob top fill<br>Optical packaging          |
| <b>OG142-112</b> | 1,200 - 1,700<br>@ 100rpm     | >90°C  | 83D      | 1.5560 | Medium viscosity<br>High moisture resistance<br>Exceptional bond strength                                      | Glob top fill<br>Micromolded lens<br>Optical packaging              |
| <b>OG146-104</b> | 164 @ 100rpm                  | 81°C   | 80D      | 1.5251 | Very low viscosity<br>Excellent non-yellowing properties<br>Fast cure                                          | Fiber bundling/assembly<br>LCD/Haptic<br>Medical devices            |
| <b>OG146-178</b> | 164 @ 100rpm                  | 82°C   | 82D      | 1.5354 | Low viscosity & excellent flow<br>Plastic bonding<br>Fast cure                                                 | Fiber bundling/assembly<br>LCD/Haptic<br>OLED/OPV                   |
| <b>OG159-2</b>   | 100,000 - 140,000<br>@ 2.5rpm | >30°C  | 69D      | 1.5715 | Thixotropic<br>Contains 1 mil glass beads<br>Excellent moisture resistance                                     | Glob top<br>LCD/OLED gasket seal<br>Optical packaging               |
| <b>UJ1190</b>    | 501 @ 100rpm                  | 100°C  | 80A      | 1.5091 | Low viscosity<br>Good for thick sections                                                                       | OLED                                                                |

*This Guide will assist in determining which product(s) may be best suited for your application.*

*Additional assistance in material selection, optimal lamp choice, and cure recommendations are readily available by contacting our Technical Application Experts at [techserv@epotek.com](mailto:techserv@epotek.com) or +1 978-667-3805.*

performance, UV curing adhesives based on **Epoxy** and **Acrylate** systems.  
*superior performance for a wide variety of applications.*



## UV Cure Only

| Product        | Viscosity<br>@ 23°C (cPs) | Tg     | Hardness | Nd*    | Performance Features                                      | Applications                                                         |
|----------------|---------------------------|--------|----------|--------|-----------------------------------------------------------|----------------------------------------------------------------------|
| <b>OG133-8</b> | 1,000 - 1,500<br>@ 100rpm | <10°C  | 65A      | 1.5244 | Thixotropic<br>Low Tg & hardness<br>Excellent flexibility | Flex edge seal/glob top<br>Fiber optic assembly<br>Optical packaging |
| <b>OG142</b>   | 9,000 - 15,000<br>@ 20rpm | >95°C  | 86D      | 1.5809 | Medium viscosity<br>High strength<br>Moisture resistance  | LCD plug and gasket seal<br>Dental applications<br>Glob top/OLED     |
| <b>OG154-1</b> | 26,000 - 34,000<br>@ 5rpm | >100°C | 80D      | 1.5692 | High viscosity<br>High Tg<br>Low Modulus                  | Fiber optic/packaging assembly<br>Glob top<br>LCD gasket seal        |

## UV + Thermal Post Cure

For Shadow Curing

| Product         | Viscosity<br>@ 23°C (cPs) | Tg     | Hardness | Nd*    | Performance Features                                | Applications                                                    |
|-----------------|---------------------------|--------|----------|--------|-----------------------------------------------------|-----------------------------------------------------------------|
| <b>OG198-54</b> | 200 - 450<br>@ 100rpm     | 131°C  | 86D      | 1.5256 | Low viscosity<br>High Tg<br>Excellent bond strength | Fiber optic assembly<br>Optical packaging<br>V-groove alignment |
| <b>OG198-55</b> | 1,200 - 2,000<br>@ 100rpm | >120°C | 85D      | 1.5196 | Thixotropic<br>High viscosity<br>High Tg            | Fiber optic assembly<br>Optical packaging<br>V-groove alignment |

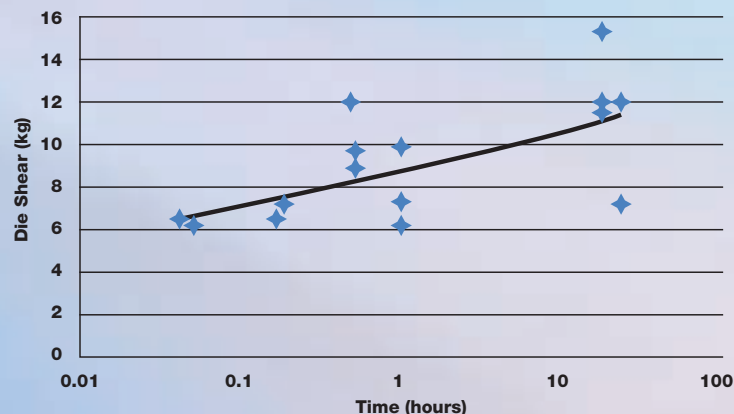
## UV/Visible Light Cure

| Product      | Viscosity<br>@ 23°C (cPs) | Tg    | Hardness | Nd*    | Performance Features                               | Applications      |
|--------------|---------------------------|-------|----------|--------|----------------------------------------------------|-------------------|
| <b>OG178</b> | 300 - 600<br>@ 100rpm     | >50°C | 86D      | 1.5445 | Low viscosity<br>Low Tg<br>Excellent bond strength | Optical packaging |

\* Cured index measured at 589nm

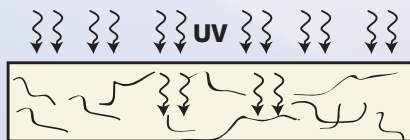
## Additional Epoxy UV Benefits

**Die Shear Increases Over Time\***



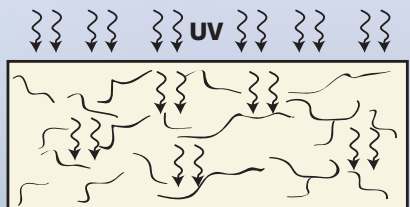
\*Above test results for OG116-31 show a die shear increase over time after 30 second UV cure. This type of result is representative of the EPO-TEK® Epoxy-Based UV line.

## Both Thin And Thick Sections Can Be Cured With Epoxy UV's



### Thin Section

UV passes easily through highly mobile polymer chains, *cures well*.



### Thick Section

Using a lower intensity, longer wave length and longer cure time, *a good cure can be achieved*.

## Selecting Best UV Lamps/Cure Time

| Product   | 365nm Flood LED | Pulsed Hg Lamp | F Style Hg Flood Cure | F Style Hg Spot Cure |
|-----------|-----------------|----------------|-----------------------|----------------------|
| OG116     | **              | ***            | ****                  | **                   |
| OG116-31  | ***             | ****           | ****                  | **                   |
| OG142     | ****            | ****           | ****                  | ****                 |
| OG142-112 | ***             | ***            | ****                  | ***                  |
| OG142-87  | ***             | ****           | ****                  | ***                  |
| OG142-95  | ***             | ****           | ****                  | ***                  |
| OG146-178 | ****            | ****           | ****                  | ****                 |
| OG154-1   | ***             | ***            | ****                  | ***                  |
| OG159-2   | ****            | ****           | ****                  | ****                 |
| OG198-54  | ****            | ****           | ****                  | ****                 |
| OG198-55  | ****            | ****           | ****                  | ****                 |
| UJ1190    | ◆               | ***            | ****                  | ◆                    |
| OG146-104 | ****            | ****           | ****                  | ****                 |
| OG178     | *               | ***            | ****                  | ◆                    |

Cure Time (min): <1 \*\*\*\* 1-3 \*\*\* 3-5 \*\* 5-10 \* >10 ◆

# EPO-TEK® Specialty UV Curing Selector Guide

## Acrylate-Based UV Benefits

**Extremely fast cure (seconds)**

**Generally optically clear**

**No thermal post cure needed**

**Not sensitive to moisture or other bases**



### Selecting Best UV Lamps/Cure Time

| Product                                               | 365nm Flood LED | Pulsed Hg Lamp | F Style Hg Flood Cure | F Style Hg Spot Cure |
|-------------------------------------------------------|-----------------|----------------|-----------------------|----------------------|
| OG603                                                 | ****            | ****           | ****                  | ****                 |
| OG653                                                 | ****            | ****           | ****                  | ****                 |
| OG675                                                 | ****            | ****           | ****                  | ****                 |
| Cure Time (min): <1 **** 1-3 **** 3-5 ** 5-10 * >10 ◆ |                 |                |                       |                      |

## UV Cure Only

| Product | Viscosity @ 23°C (cPs) | Tg    | Hardness | Nd*    | Performance Features                                                                          | Applications                                                   |
|---------|------------------------|-------|----------|--------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| OG603   | 150 - 250 @ 100rpm     | >70°C | 84D      | 1.5037 | Low viscosity<br>USP Class VI adhesive<br>Fast cure                                           | Fiber optic components<br>Medical implants<br>Optical assembly |
| OG653   | 650 - 850 @ 100rpm     | >40°C | 76D      | 1.5106 | Low viscosity, green colored<br>Light blocking properties<br>Very fast cure (1-3 sec @ 365nm) | RFID glob top                                                  |
| OG675   | 3,426 @ 100rpm         | 0°C   | 70A      | 1.4950 | Medium viscosity<br>Fast cure<br>Low Tg                                                       | Fiber optic assembly<br>LCD lamination                         |

\* Cured index measured at 589nm

For additional information, please visit us at: [www.epotek.com](http://www.epotek.com), or email our Technical Services Group at: [techserv@epotek.com](mailto:techserv@epotek.com)



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