



Durable UV80TR (Translucent)



Reactor chamber

## Compatible Printers

UV LCD & DLP 3D Printers



## Colours

 Translucent

Available in 1kg bottle

## Introduction

Photocentric's Durable range is the most versatile material of the Photocentric functional materials. Durable UV80 is similar to ABS in its ability to resist impact, compress, bend and stress fatigue without breaking or deforming. Photocentric Durable UV80TR works with a variety of UV LCD and DLP 3D printers, as well as the Photocentric Liquid Crystal Dental and Opus printers.

## Best Used for

- Jigs and fixtures requiring minimal deflection
- Cover-plates and enclosures
- Fastenings, tools and couplings
- Suitable for end use parts

## USPs

- Tough, durable, and long-lasting
- Simulating the strength and stiffness of ABS
- Smooth surface finish
- Translucent finish suitable for micro-reactors

## Properties

### Tensile Properties

Tensile Modulus *	2127 MPa	ASTM D638
Tensile Strength (Break) *	68.2 MPa	ASTM D638
Tensile Strength (Yield) *	77.2 MPa	ASTM D638
Elongation at break *	16%	ASTM D638

### Flexural Properties

Flexural Strength *	89.6 MPa	ASTM D790
Flexural Modulus *	2277 MPa	ASTM D790

### Impact Properties

Impact Strength Notched Izod *	67.4 J/m	ASTM D256
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### General Properties

Shore Hardness *	90 Shore D	ASTM D2240
Heat Deflection Temperature*	76°C	ASTM D648
Water absorption (%)* after 24 hrs	0.8	Internal
Water absorption (%)* after 72 hrs	Available Upon Request	Internal
Water absorption (%)* after 7 days	Available Upon Request	Internal
Viscosity	400 cPs	At 25°C Brookfield spindle 3
Density	1.10 g/cm <sup>3</sup>	
Storage	10<T>50°C	

\* Mechanical properties stated based on fully cured material.

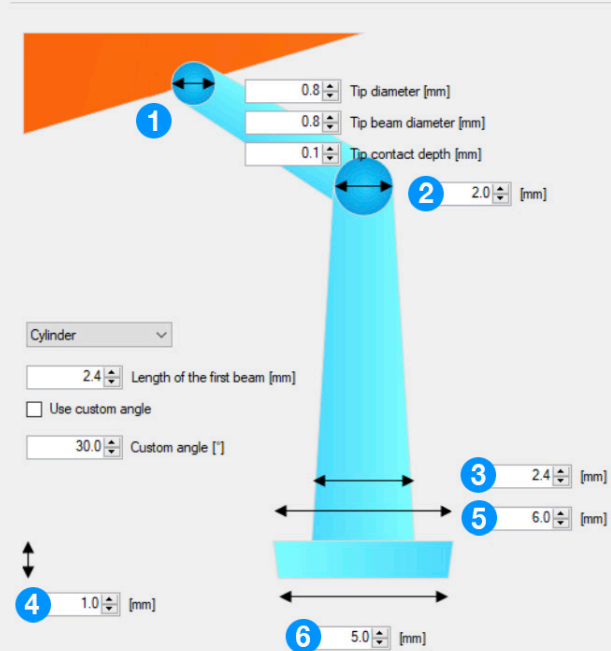
## Design Consideration Parameters

These are example parameters in relation to a UV LCD printer with 81um XY resolution.

Properties	Parameters
Minimum feature size (pins)	0.4mm
Minimum hole diameter	0.8mm
Minimum slot thickness	0.6mm
Minimum wall thickness	0.4mm
Overhangs	Successful for overhangs $\leq 60^\circ$ with no support
Round Dim Fit	Parts fit with resistance at 1mm <a href="#">Click to view sample</a>
Square Dim Fit	Parts fit perfectly with no resistance at 0.06mm offset <a href="#">Click to view sample</a>
Minimum wall thickness unsupported	Minimum wall thickness un supported is 2mm with maximum height of 80mm.
Scaling factor	X +1%   Y+1%   Z+0.7%

## Recommended Support Parameters & Orientation:

These are recommended support settings in relation to a UV LCD printer with 81um XY resolution.



	Large Models		Small Models	
Diagram reference numbers	Parameters	Values	Parameters	Values
1	Tip Diameter (mm)	0.8	Tip Diameter (mm)	0.5
2	Pole Diameter (mm)	2	Pole Diameter (mm)	1.5
3	Pole Widening Factor	1.5	Pole Widening Factor	1.5
-	Model Height from Base (mm)	10.0	Model Height from Base (mm)	10.0
4	Height of Support Foot (mm)	2	Height of Support Foot (mm)	2
5	Top of Foot Diameter (mm)	5	Top of Foot Diameter (mm)	5
6	Bottom of Foot Diameter (mm)	3	Bottom of Foot Diameter (mm)	3

• Recommended orientation around all axes is 45°

## Printer and Resin Profiling

### Photocentric UV Printers

- To print with Photocentric UV printers, choose 'Durable UV80TR' and the desired layer thickness when preparing your print file in Photocentric Studio.

### 3rd Party UV Printers

- Photocentric UV high-performance resins have been formulated to be compatible with a wide range of 3rd Party Printers. This list is continually updated, for the most up-to-date information, please visit our UV Resin Compatibility Page. All resins are functional at a wavelength of 385-405 nm.
- Please see below instruction on how to calculate appropriate exposure time with regards to your 3rd party UV printer and purchased resin

## UV Resin Layer Exposure Guidelines

### Overview

This guide will assist you in establishing a layer exposure time for a desired resin and layer thickness based on the characteristics of Photocentric's UV Resin range and your UV 3D printer.

Each resin requires a specific energy to cure a certain layer thickness. 'Energy' is defined by multiplying 'light output intensity' of your printer and a 'given time of exposure'. The equation below simply explains the matter:

$$\text{Energy [mJ/cm}^2\text{]} = \text{Light Output Intensity [mW/cm}^2\text{]} \times \text{Exposure Time [s]}$$

Your UV 3D printer manufacturer will provide you with light output intensity value.

Layer Thickness (µm)	25	50	100
A UV 3D printer with 5mW/cm <sup>2</sup> light output intensity	3 secs	3.5 secs	4 secs
Ec(mJ/cm <sup>2</sup> )		17.2	
Dp(mm)		260	

**NOTE:** Bear in mind the exposure time vs energy is not a linear trend, and this data is intended strictly as a guideline. Settings may need to be further optimised to suit each printer.

## Resin Preparation prior to Print

- Heat the resin to 30°C in the bottle.
- Shake the resin bottle for 2 minutes before pouring into the resin vat.

## Post-Processing

To reach the full mechanical properties of the material, parts printed using UV Durable UV80TR resin will need to be post-processed.

1. Remove the print platform from the printer and place in to the wash unit. You can use 'Photocentric Wash15' or 'Photocentric Air Wash L' as Wash units.
2. Follow resin cleaner/solvent TDS for relevant wash cycles. You can use 'Photocentric Resin Cleaner's as the cleaning mediums. For 'Photocentric Resin Cleaner 30' washing cycle is 10 minutes.
3. Make sure you do not exceed the recommended wash cycles as it might have adverse effect on the mechanical properties.
4. Rinse parts with warm water for 1-2 minutes.
5. Where possible, use compressed air to dry the parts, if not, leave them to dry naturally.
6. The parts printed can be cured in any UV post-curing unit. You can use 'Photocentric Cure M+' for 1-2 hours at 60°C depending on the size of parts.
7. Parts printed with UV Durable UV80TR are suitable for thermal shocking. To remove parts from the platform, remove from the cure unit and submerge immediately in cold water, the parts will become easily free.
8. Alternatively, Remove the platform from the cure unit and place on to a suitable flat surface. use a scraper or suitable cutters and take care to not damage the part/(s) when removing them from the platform.