

## MATERIALS FOR UV R2R EMBOSSING



### GENERAL DESCRIPTION

Nanocomp embosses commercial thin foils with in-house developed and commercial UV resins. This enables fabrication of unique products for optical applications by UV R2R technology. Materials are available in standard thicknesses and web widths. The refractive index of the UV-embossed coating can be tuned to different foils. Performance in environmental and adhesion tests is excellent, and optical properties and appearance are retained during testing.

### DESCRIPTION OF MATERIALS

**Embossed micro-structured coating (<math>< 50 \mu\text{m}</math>)**

**Substrate foil (PET, PC, PMMA...)**

**Removable protective foil on request (under <math>60 \mu\text{m}</math>)**

Figure 1. General construction of materials

## ENVIRONMENTAL TESTING

- IEC 60068-2-2 Test B: Dry heat (Extended with gradual change of temperature); heat resistance test
- IEC 60068-2-30: Environmental testing - Part 2: Tests Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
- IEC 60068-2-1 Test A: Cold tests (Extended with gradual change of temperature)

Test	Temperature (°C)	Time (hours)	Rel. Moisture (%)
Heat resistance	85	200	-
Damp heat	25 ↔ 55	3x144	95
Resistance to cold	-40	120	-

Table 1. Environmental testing parameters

## ADHESION TEST

Test method: Adhesion test with grid method  
Cross-cut test for coated/painted surfaces (ISO 2409). All material pairs have passed the test.

Test method	Quality before test	Quality after test
Heat resistance	Excellent	Excellent
Damp heat	Excellent	Excellent/fair
Resistance to cold	Excellent	Excellent

Table 2. Adhesion testing parameters

## KEY FEATURES

Substrate	Features
PC	<ul style="list-style-type: none"> <li>• standard thicknesses 100, 175, 250, 475 and 500 µm</li> <li>• high optical transparency</li> <li>• high heat resistance (even &gt; 200 °C)</li> <li>• post-processing possible (IML, IMD)</li> <li>• easy to die-cut</li> <li>• good scratch resistance of embossed UV resin</li> </ul>
PMMA	<ul style="list-style-type: none"> <li>• standard thicknesses 175, 250, 375 and 500 µm</li> <li>• high optical transparency</li> <li>• good weathering and UV resistance</li> <li>• very high optical transparency</li> <li>• excellent for light guide applications</li> <li>• post-processing possible (IML, IMD)</li> <li>• very good scratch resistance of both layers</li> <li>• easy to laser-cut</li> </ul>
PET	<ul style="list-style-type: none"> <li>• standard thicknesses 75, 175 and 250 µm</li> <li>• high optical transparency</li> <li>• post-processing possible (IML, IMD)</li> <li>• outstanding heat resistance</li> <li>• low haze</li> <li>• good scratch resistance of embossed UV resin</li> <li>• easy to laser-cut</li> </ul>
TPU	<ul style="list-style-type: none"> <li>• standard thicknesses 180 and 200 µm</li> <li>• excellent for light guide solutions (keypads), elastic</li> <li>• very good UV resistance and outdoor properties</li> </ul>

**NANOCOMP LTD** is a high-tech company with extensive experimental as well as theoretical knowledge on diffractive optics. Focusing on optimization, fabrication and replication of optical components, we carry out continuous research and development to provide versatile services for various branches of industry that use microstructured components in their products.



Nanocomp Oy Ltd  
Ensolantie 6  
FI - 80710 Lehma, FINLAND

tel. +358 13 316 616  
fax +358 13 316 617  
[www.nanocomp.fi](http://www.nanocomp.fi)