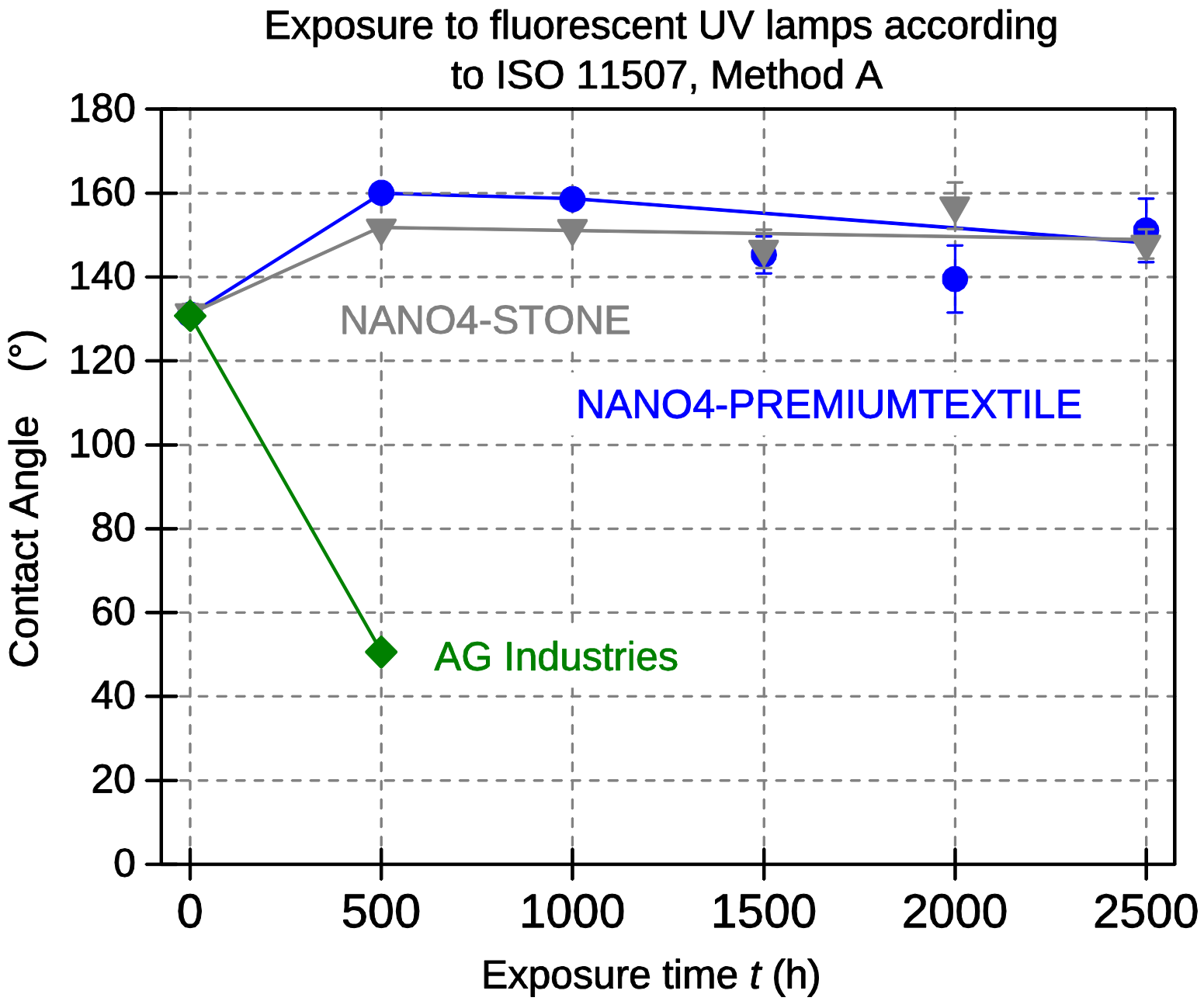

This test is made by the Polymer Service GmbH Merseburg , Institute

Experimental details

Exposure of fluorescent UV lamps according to ISO 11507, Method A (2007-02) **[1]**

Test conditions:

Lamp type:	UV-A-340 (Type II)
Irradiance E_λ:	0.76 W · m^{-2} · nm^{-1}
Black panel temperature:	60 °C ± 3 °C
Black panel temperature during condensation:	50 °C ± 3 °C
Method A:	
Dry phase	4 hours
Condensation	4 hours (UV lamps off)
Exposure time:	2500 h

Fig. 1: Accelerated Weathering Tester QUV/SPRAY and water treatment plant type ELIX 15 (left side) and test specimen mounted on flat specimen holders (right side)

Contact angle measurements according to DIN 55660-1 und DIN 55660-2 [2, 3]

Test conditions:

Test liquid:	distillated water
Drop capacity:	4 µl
Number of drops:	10
Manner of the contact angle measurements:	static
Numerical method (measurement range):	
Young-Laplace equation	20° till 110° and 110° till 180°

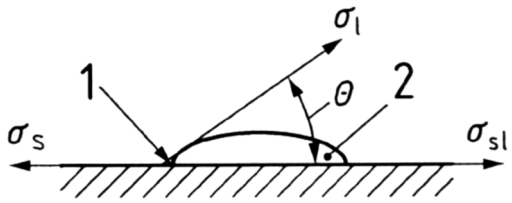

Fig. 2: Schematic representation of the contact angle measurements; 1 – three phase point, 2 – liquid, σ_l – surface energy of the liquid, σ_S – free surface of the solid state surface, σ_{Sl} – interface energy between solid state surface and liquid, θ – contact angle [2]

Results

The results of the contact angle measurements for NANO-PREMIUMTEXTILE shows Tab. 1. The graphic representation of the change of the contact angle in dependence on the exposure with fluorescent UV lamps visualizes Fig. 3.

Tab. 1: Results of the contact angle in dependence on the exposure time

Exposure time	NANO-PREMIUMTEXTILE
Initial value	**131.0** ± 1.9
500 h	**160.1** ± 0.7
1000 h	**158.6** ± 0.7
1500 h	**145.3** ± 4.4
2000 h	**139.5** ± 8.0
2500 h	**151.1** ± 7.5

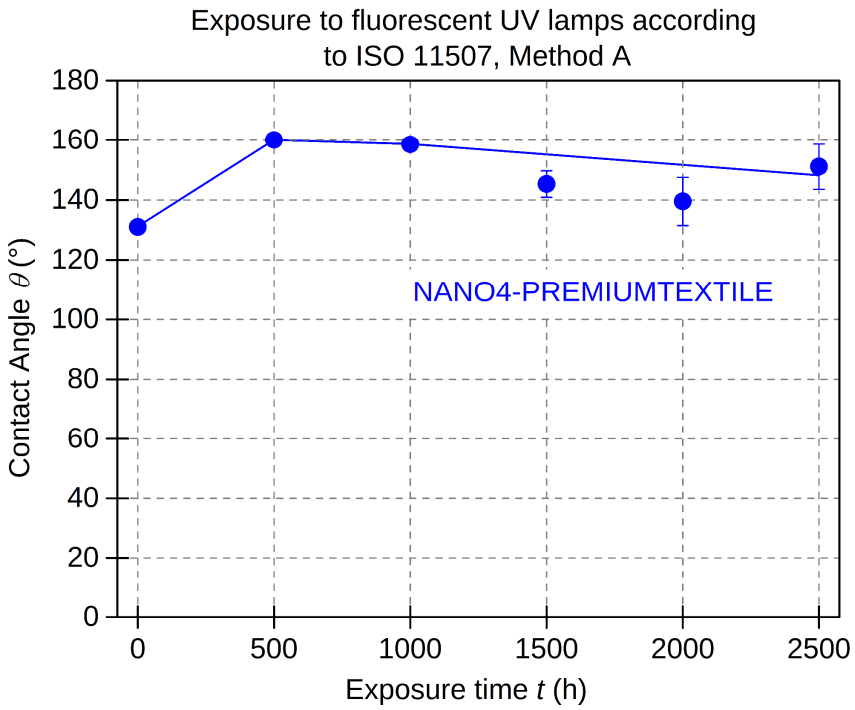

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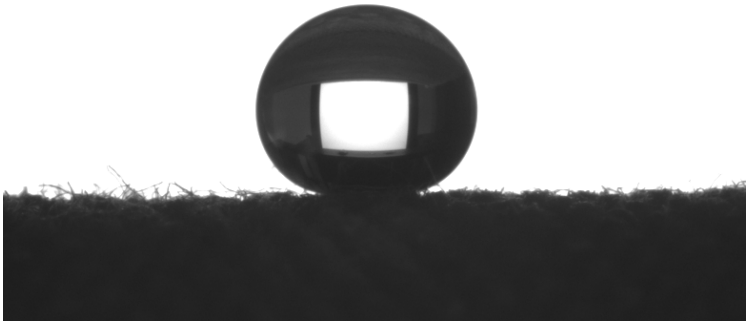
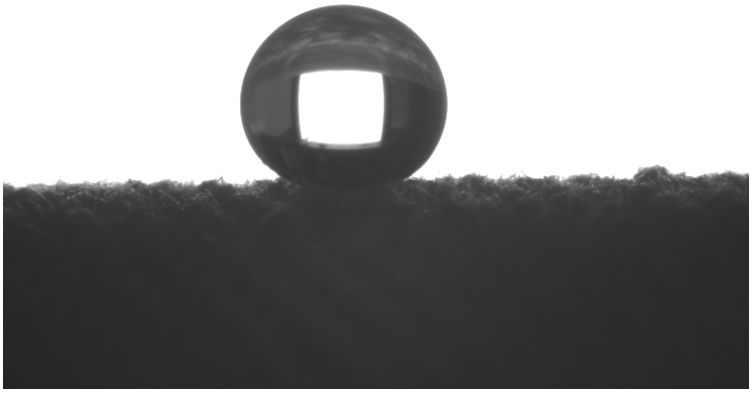
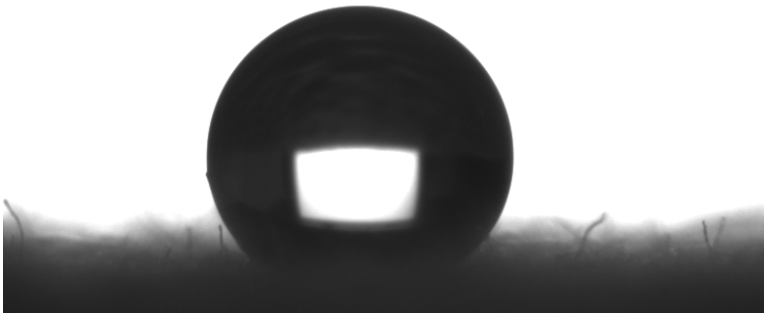
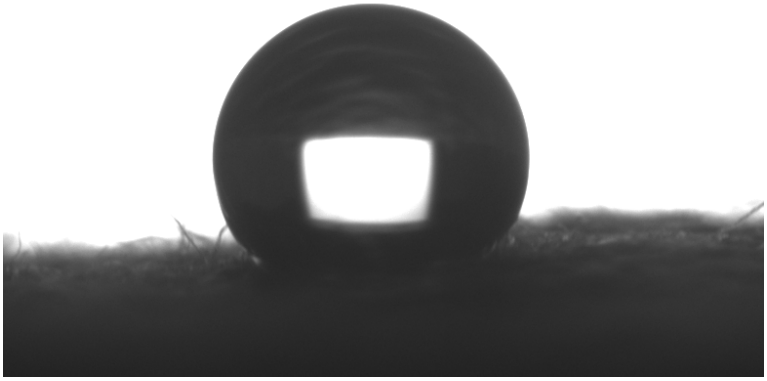
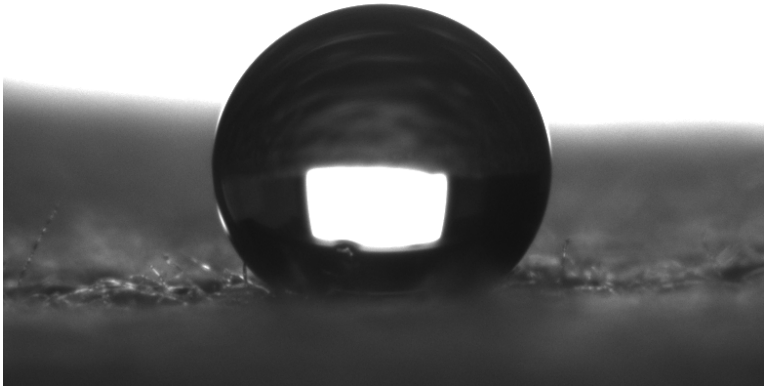
Fig. 3: Graphic representation of the contact angle in dependence on the exposure with fluorescent UV lamps

Exposure time (h)	Photos
Initial value	no photo
500	
1.000	
1.500	
2.000	

2.500



Literature

[1] ISO 11507 (2007-02): Paints and varnishes – Exposure of coatings to artificial weathering – Exposure to fluorescent UV lamps and water

[2] DIN 55660-1 (2011-12): Beschichtungsstoffe – Benetzbarkeit – Teil 1: Begriffe und allgemeine Grundlagen

[3] DIN 55660-2 (2011-12): Beschichtungsstoffe – Benetzbarkeit – Teil 2: Bestimmung der freien Oberflächenenergie fester Oberflächen durch Messung des Kontaktwinkels