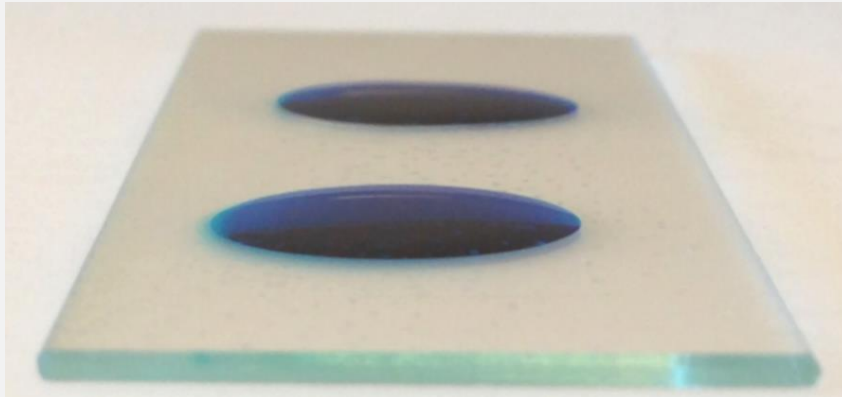


T100 Hydrophilic coating



T100 is a coating with superior hydrophilic properties, which can be applied to most surfaces and materials. T100 has the special property that it retains a low contact angle when exposed to water For a long time.

T100 Coating features

- Very hydrophilic coating (water contact angle $\sim 10^\circ$)
- Long functional life (2+ years) thus easily supporting a 2 year shelf life of the coated medical device
- Retains low contact angle in prolonged contact with water
- Fast, simple and flexible coating process (5 seconds coating and 10 seconds drying)
- Coating tolerant to storage without temperature and humidity control
- Excellent adhesion to most materials
- Optically clear but with a faint yellow tone
- Very thin coating
- Biocompatible
- Safe solvent chemistry
- Only recommended for single use due to the strong interaction with liquid water.

Material compatibility

For any material we have tested T100 has given uniform coatings, excellent adhesion and left the surface very hydrophilic. The contact angle is $10^\circ \pm 5^\circ$ for the tested materials.

T100 is not suitable for very hydrophobic materials: PTFE, PP, PE etc. as the coating will not be uniform.

Processing guidelines

Surface preparation

The surface to be coated with T100 must be clean and free of dust, oil, water and volatiles. Other than this the surface does not need any preparation.

Coating methods

T100 can be applied to most substrates by spray, dip, spin, brush, roller or ink-jet coating. The available equipment and the device to be coated will determine the best coating method.

The internal surfaces of a finished device can also be coated by filling channels etc. with the T100 solution by capillary force, and then letting it dry from the device openings. A word of caution on this coating method; during drying the T100 solution will concentrate at locations of high capillarity (small geometry), and the T100 coating at these locations may thus be unacceptably thick. For this coating method we recommend diluting T100 ten times with pure ethanol.

Drying

At room temperature the solvent will evaporate very quickly, often the surface will be dry in 5-10 seconds after coating. No additional drying is needed. It is recommended to ensure proper ventilation to remove the evaporating solvent.

Coating thickness

The optimum T100 coating thickness is 10 nanometer. The minimum coating thickness is 5 nanometer, below this the coating is less hydrophilic and may have shorter functional life. The coating can have any thickness greater than 10 nanometers, but the coating does not become more hydrophilic and with great thickness it also becomes hazy. A T100 coating at 10 nanometer thickness should be invisible to the unaided eye. If the coating is visible (haze, fringes, visible structure etc.) then it is thicker than it need be. When done correctly it is not possible to see if a surface is coated or not.

Removal

If needed a T100 coating can be removed by washing the coated surface in ethanol. Ultrasound or mild abrasion may be needed to remove T100 completely.

Initial R&D work

For initial R&D work it is recommended to T100 coat a device by an airbrush with a fine nozzle. If no airbrush is available a quick dip coat works as well. After coating simply leave the device in air to dry.

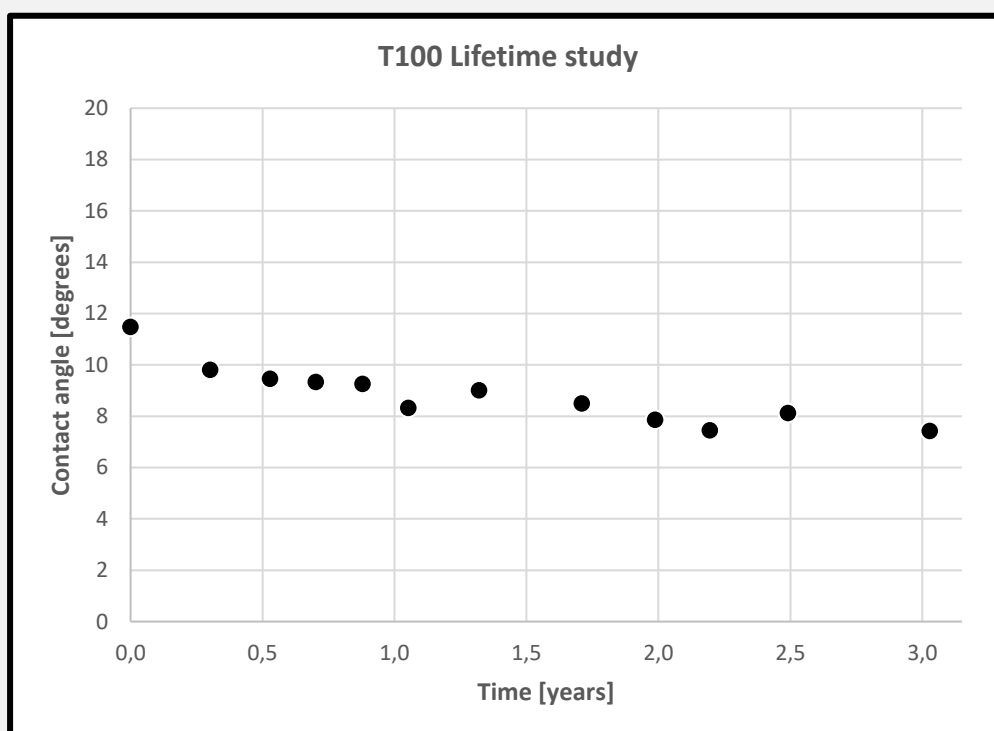


Functional life of a T100 coating

Unlike many hydrophilic treatments, a T100 coating has a very long functional life. If stored as recommended a device with a T100 coating will stay very hydrophilic for many years, and the hydrophilic coating thus easily support a 2 year product shelf life.

Accelerated functional life study

An accelerated functional life study (ASTM-F1980) has been made in normal humid air. A minor decrease in water contact angle is observed over the first years. The contact angle stays in the range 7° to 12°.



Exposure to water

Most hydrophilic coatings will fast lose the hydrophilicity when contacting water. T100 is unique in the sense that it retains the hydrophilic surface property even in prolonged contact with water.

Example:

1. Initial contact with water: Contact angle 10° (advancing contact angle)
2. While in contact with water: Contact angle 0° (receding contact angle)
3. After drying and wetting again: Contact angle 65° (advancing contact angle)
4. After submerging in water: Contact angle 0° (receding contact angle)

Storage, disposal and safety

Storage

Liquid T100 solution

Store T100 upright and in tightly closed containers in a cool, dry environment away from direct sunlight at a temperature of 4-27°C (40-80°F). Shelf life is 24 months from date of manufacture.

Dry T100 coating

Unlike many hydrophilic treatments, a device with a T100 coating can be stored at normal room temperature and without humidity control, provided these conditions do not cause condensation of water on the T100 coated surface.

The device with the T100 coating should be stored so it is not exposed to;

- Temperatures above 60°C (5 minute exposure to 120°C is acceptable for welding)
- Liquids or condensing atmosphere
- UV radiation
- Abrasion

A T100 coating is very tolerant toward low and high humidity, temperature variations and vibration.

Disposal

T100 may be included with other waste containing similar organic solvents to be discarded for destruction or reclaim in accordance with local state and federal regulations. It is the responsibility of the customer to ensure the disposal of T100 and residues made in observance of all federal, state, and local environmental regulations.

Environmental, Health and Safety

Liquid T100 solution

T100 solution is mainly Ethanol use the same precautions you would when using Ethanol. Handle with care. Wear chemical goggles, chemical gloves and suitable protective clothing when handling T100. Do not get into eyes, or onto skin or clothing. Use with adequate ventilation to avoid breathing vapors or mist. In case of contact with skin, wash affected area with soap and water. In case of contact with eyes, rinse immediately with water and flush for 15 minutes lifting eyelids frequently. Get emergency medical assistance.

Dry T100 coating

When dried the T100 coating is biocompatible and completely safe. No precautions are needed, but we don't recommend getting T100 dust into the eyes or consuming it.

Warranty

The information in this datasheet is based on our experience and is, we believe to be reliable, but may not be complete. We make no guarantee or warranty, expressed or implied, regarding the information, use, handling, storage, or possession of this product, or the application of any process described herein or the results desired, since the conditions of use and handling of the product is beyond our control.

