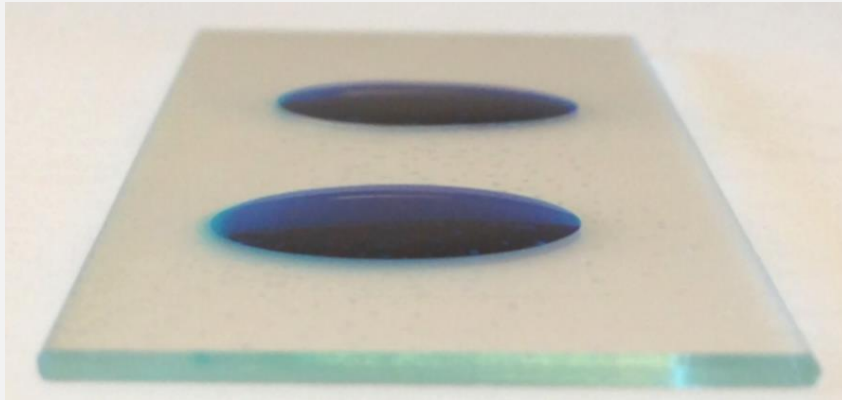


S100 Hydrophilic coating



S100 is a patent pending coating with superior hydrophilic properties, which can be applied to most surfaces and materials. S100 can be used for a number of applications, but is developed for single use diagnostic consumables based on capillary microfluidics.

S100 Coating features

- Very hydrophilic coating (water contact angle $\sim 10^\circ$)
- Long functional life (10+ years) thus easily supporting a 2 year shelf life of the coated medical device
- 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
- High optical clarity
- Very thin coating
- Biocompatible
- Safe solvent chemistry
- Only recommended for single use due to the strong interaction with liquid water.
- FDA approved ingredients

Material compatibility

For any material we have tested S100 has given uniform coatings, excellent adhesion and left the surface very hydrophilic.

Tested materials; Polycarbonate, polystyrene, Acrylic/PMMA, COC/COP, PCL, glass, paper, Aluminium, Steel. The contact angle is $10^\circ \pm 5^\circ$ for the tested materials.

S100 is more suitable for hydrophobic materials (PP, PE, PDMS etc.) than P100.

Processing guidelines

Surface preparation

The surface to be coated with S100 should be clean and free of dust, oil, water and volatiles. Other than this the surface does not need any preparation.

Coating methods

S100 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 S100 solution by capillary force, and then letting it dry from the device openings or blowing the device dry by compressed air. A word of caution on this coating method; during drying the S100 solution will concentrate at locations of high capillarity (small geometry), and the S100 coating at these locations may thus be unacceptably thick. For this coating method we recommend S100d which is a lower concentration of S100.

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 S100 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 S100 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 S100 coating can be removed by washing the coated surface in IPA. Ultrasound or mild abrasion may be needed to remove S100 completely.

Initial R&D work

For initial R&D work it is recommended to S100 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.

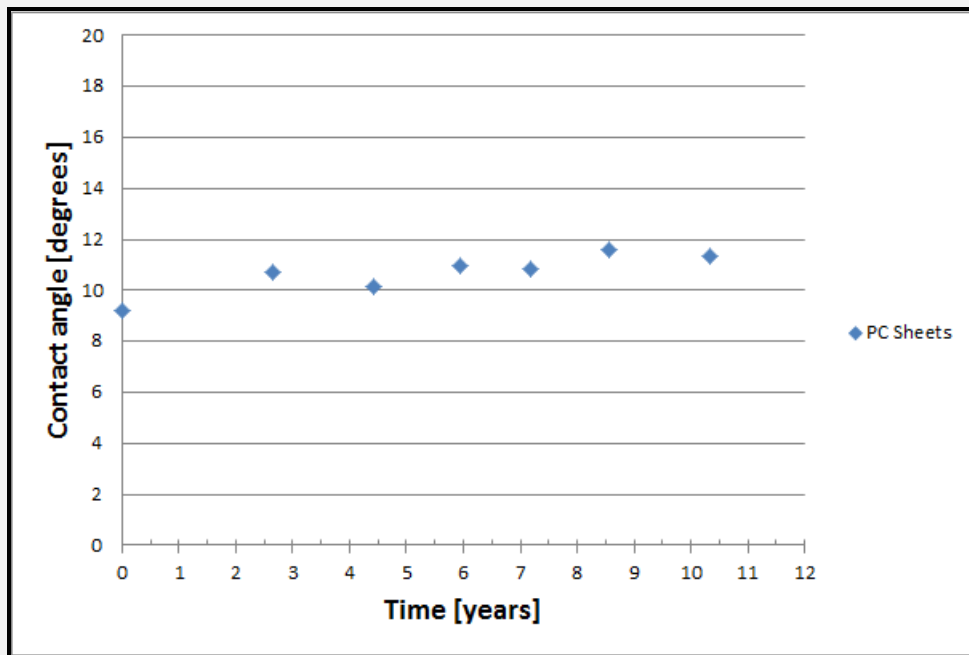


Functional life of a S100 coating

Unlike many hydrophilic treatments, a S100 coating has a very long functional life. If stored as recommended a device with a S100 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 increase in water contact angle is observed over 10 years. The contact angle stays in the range 9° to 12°.



Storage, disposal and safety

Storage

Liquid S100 solution

Store S100 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 S100 coating

Unlike many hydrophilic treatments, a device with a S100 coating can be stored at normal room temperature and without humidity control, provided these conditions do not cause condensation of water on the S100 coated surface.

The device with the S100 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 S100 coating is very tolerant toward low and high humidity, temperature variations and vibration.

Disposal

S100 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 S100 and residues made in observance of all federal, state, and local environmental regulations.

Environmental, Health and Safety

Liquid S100 solution

S100 solution is mainly Isopropanol (IPA) use the same precautions you would when using IPA. Handle with care. Wear chemical goggles, chemical gloves and suitable protective clothing when handling S100. 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 S100 coating

When dried the S100 coating is biocompatible and completely safe. No precautions are needed, but we don't recommend getting S100 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.

