

## Chemistry for a Blue Planet

Create a Safe, Secure, Comfortable and  
Environmentally Friendly World  
with Chemical Technology

**AGC Inc.**  
**Chemicals Company**

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Amorphous Fluoropolymer  
**CYTOP**

**AGC Chemicals**

















## Features of various coating methods of CYTOP

### Feature

Coating method	Spin-Coating	Dip-Coating	Potting
Membrane thickness of CYTOP	10 μm or less	1 μm or less	1 to 20 μm
Shape of substrate	Flat board (or sheet), Circular board	Any type of board may be used.	Any type of board may be used.
Control factors of membrane thickness	Solution concentration, Solution viscosity, spinning speed	Solution concentration, Solution viscosity, Pull-up speed	Solution concentration, Nozzle shape
Thickness controllability	Highly accurate	Highly accurate if dip coater is used	Variable
Suitable CYTOP series	CTX-800 series CTL-800 series Solvent: CT-solv180	CTX-100E series CTL-100E series Solvent: CT-solv100E	CTX-100E series CTX-800 series

Notes: Whichever coating method is used, it can be repeated several times to give the thickness. In such case, after applying the first coat, let it dry uncompletely before applying another coat (1-10 minutes at 70-120 °C). Any bubbles in the CYTOP liquid must be removed before drying.

### Pretreatment method of base material

Type of base material	Pretreatment method (for use with Standard grade A)	Applications
Glass	Treatment with silane coupling agent (H <sub>2</sub> NC <sub>3</sub> H <sub>6</sub> Si (OC <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> , etc.) Dilution solvent: ethanol, water, etc. Concentration: 0.001 to 0.05% Solvent drying (spin drying, etc.)	Glass, Quartz, Silicon wafer
Metal	No special pretreatment is required. (Silane coupling pretreatment similar to that for glass is also effective.)	Iron, SUS, Aluminum, Silver, etc.
Plastic	Silane coupling agent (KBE903 from Shin-Etsu Chemical Co., Ltd.) Treatment example Diluent ethanol/water = 95/5 Concentration = 0.1wt%. Solvent dried by air-drying after application, rinsed with water and then CYTOP-coated.	PMMA, PC, PS, PSF, etc.

### Example of CYTOP curing conditions

\* is only an example for reference. Please examine and determine the optimum conditions.  
80°C × 60 min. (oven) + 200°C × 60 min. (oven)

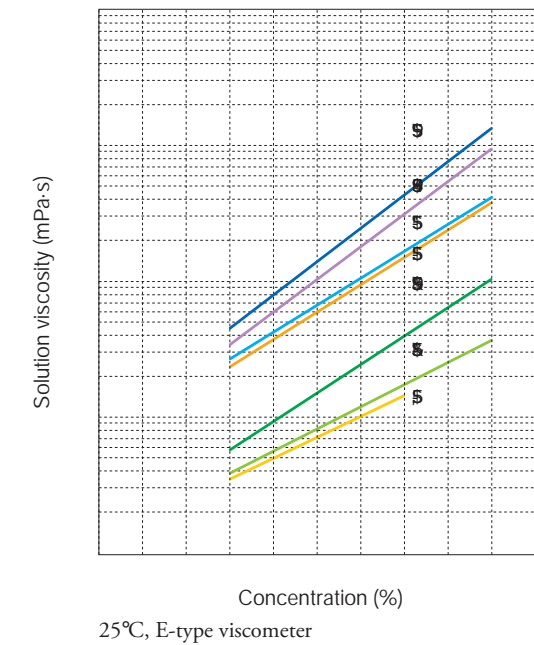
## Solution

### Boiling point

Two types of CYTOP solution are available to meet the different coating methods of customers.

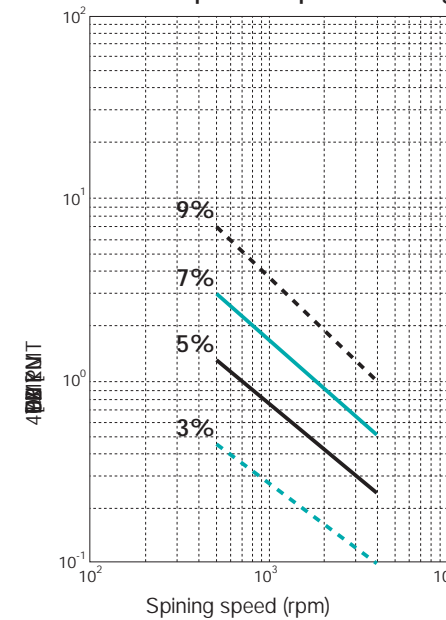
- 180°C: For spin coating
- 100°C: For dip coating

### Viscosity of CYTOP

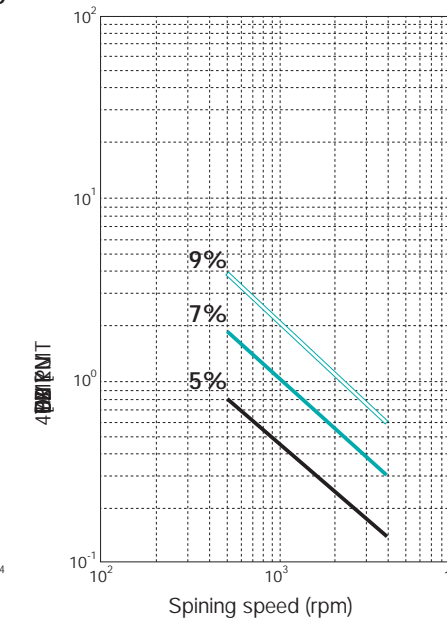


## Coating characteristics

### Example of spin coating

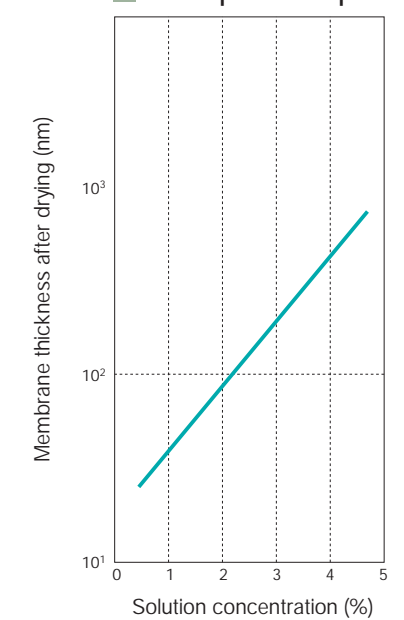


Standard type (CTX-809A) diluted with CT-SOLV180



Low molecular weight type (CTL-809A) diluted with CT-SOLV180  
Coating conditions: 500 rpm × 10 sec + specified number of revolutions × 20 sec

### Example of dip coating



CYTOP CTX-100E series  
Example is pull-up speed at 6 cm/min.

Analysis Results of Heavy Metal and Bromine: Reference example

Item	Cd Lower limit of detection: 5ppm	Cr Lower limit of detection: 2ppm	Pb Lower limit of detection: 5ppm	Hg Lower limit of detection: 5ppm	Br Lower limit of detection: 20ppm
Sample name					
CTL-109AE	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable
CTX-809A	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable
CT-SOLV100E	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable
CT-SOLV180	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable

Precautions for Handling CYTOP

**When using CYTOP, please comply with SDS.**

◆ **Precautions for thermal decomposition**

Thermal decomposition at high temperature (starts at 400°C) and a fire may generate hazardous substance like hydrofluoric acid. Therefore, do not use the product under conditions in which it will thermally decompose and ensure good ventilation for use at high temperature such as forming by melting. (Use the product at normal air pressure and a temperature of 350°C or less.)

What to do in emergencies	• Inhalation	· If someone has become sick by inhaling vapor, gas, or similar substances, rest them in a place with clean air and consult a doctor. · If their breathing is weak or has stopped, perform artificial respiration. Consult a doctor immediately.
	• If CYTOP comes into contact with your skin	· Wipe deposit immediately with a cloth. · If the affected area's appearance has changed or if the area concerned hurts, consult a doctor. · Rinse with a lot of water and soap or a detergent for skin. Do not use a solvent or thinner.
	• If CYTOP gets into your eye	· Consult a doctor as soon as possible. · Wash the eyes with a lot of clean water immediately for 15 minutes or more. Wash it off completely at the back of the eyelids.
	• If you have swallowed CYTOP	· If it is swallowed by mistake, rest and consult a doctor immediately. · Do not let a person throw up unless otherwise instructed so by a medical expert.
In the event of a fire	• Fire extinguisher	· Use a non-flammable fire extinguisher suitable for an ambient fire.
	• Specific hazard of fire	· If it is burning, a poisonous gas may be emitted.
	• Specified extinguishing method	· Remove movable containers from the area of the fire as long as it is safe to do so.
	• Protecting persons who are engaged in fire extinguishing	· If it is burning, a poisonous gas (hydrogen fluoride, halocarbonil, carbon monoxide and very toxic perfluoro-isobutylene) may be emitted. Persons who are engaged in fire extinguishing should wear self-contained breathing apparatuses.
In the event of a leakage	• Precautions for health and safety	· For indoor work, ventilate the area well until the work is completed. · When working, wear appropriate protective equipment (such as gloves, protective masks, aprons and goggles). · Wear some breathing apparatus in places with insufficient ventilation.
	• Precautions for the environment	· Dispose of deposit or waste according to the relevant laws.
	• Method of removal	· If there is a lot of waste, cover the drain and build up a bank to prevent it from entering the sewer. · Absorb waste in inert material such as dry sand and collect it in containers for disposal. · Ventilate the peripheral area. · Dispose of collected substances as soon as possible.
	• Preventing secondary accidents	· Collect any leaks in a sealable container and move it to a safe place.
Precautions for handling and storage	<i>Handling</i>	
	• Technical measures	· Use is limited for industrial purpose or experts. · Seal the container each time. · Move sources of fire away during handling and while vapor still remains after handling. · Install a local exhaust system if the fluid is handled at temperatures above its boiling point. A performance of 25 cm/sec or more must be maintained. If the fluid is at a temperature above its boiling point in a place without an exhaust system, put on a respirator, stop the heat source and evacuate the place.
	• Precautions	· Handle the fluid in a well-ventilated place. · Install a local exhaust system if the fluid is handled at a temperature above its boiling point. A performance of 25 cm/sec or more must be maintained.
	• Precautions for safe handling	· Do not eat, drink or smoke when using the product. Use soap and water to wash any areas that come into contact with this product.
Precautions for handling and storage	<i>Storage</i>	
	• Appropriate storage conditions	· Store the product in a well-ventilated, cool, dark place. · Do not store it near a source of fire. · Store it away from a strong base.
	• Safe container and packaging materials	
Exposure prevention and protection measures	• Measures for facilities	· Install a local exhaust system in a handling area. · Install a shower, hand washing basin and eye wash system near the working area. · If decomposed material may be generated because of heat, use an appropriate local exhaust system to keep the concentration of the decomposed material at below the allowable limit.
	• Protective equipment	· Protective equipment for breathing: Wear a gas mask for organic gas. · Protective equipment for hands: Wear gloves which are resistant to organic solvents or chemicals. · Protective equipment for eyes: Wear protective goggles. · Protective equipment for skin and body: Wear them as required.

**Precautions for Relevant Regulations**

- (1) Some part of CYTOP are subject to the following laws and regulations. When exporting or transferring within Japan, please check the contents and take appropriate measures. Paragraph 5 of Appended Table 1 of the Export Trade Control Order, EAR (US Export Administration Regulations).
- (2) CYTOP is an industrial product and has not been developed or manufactured with medical or food-related applications in mind.

**Further Information**

The information contained in this brochure is based on our present state of knowledge and experiences. It should not therefore be construed as guaranteeing specific properties of the product described on their suitability for a particular application.