

# Technical Data Sheet

## Product Aqua EC 1000 – 100

### Description:

This cathodic clear coat system based on acrylic resin is specially developed to coat decorative surfaces and can be applied from 5 microns to 30 microns. This cathodic clear coat system is an excellent protection for high gloss metals and metal plated surfaces of Gold, Chromium, Silver, Nickel, Aluminum, Stainless steel and other alloys from atmospheric influences as well as from every day wear and tear. This product imparts gloss, clarity, hardness, smoothness, scratch resistance, solvent resistance, chemicals / salt resistance and UV resistance to prolong the life of substrate beyond imagination.

### Supply Material Data:

<u>Test</u>	<u>Specification</u>	<u>Unit</u>
Colour	Colourless	
Viscosity	10 – 20	Pas
Density as per DIN 53217	1.0 – 1.1	G / CCM
Solid content (120 degC / 1 hr)	28 - 32	%
MEQ value (100 % solids)	38 - 42	mMol
Flash point as per DIN 53213	> 21	°C
Shelf life (Storage at 4°C to 35°C )	Maximum 6 months	
Hazard category as per VbF dated 5-6-1970	Not applicable	

### A) Procedure for Bath Preparation:

#### Formula (For 8 % solids i.e. Refractive index = 14 )

Part A - DM water           => 734 grams / ml

Part B - Supply Resin       => 266 grams

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Total - Bath volume       => 1000 grams

### Mixing Procedure:

Weigh exactly 734 grams (or ml) of DM water (Part A) in cleaned 1.5 liter of container. Weigh 266 grams of supply CED lacquer in another small container (Part B). Add Part B to Part A under gentle stirring. Rate of addition should be such that entire addition should be finished not before 15 minutes. As the entire quantity is transferred to DM water, continue stirring for another 20 minutes. Care to be taken to avoid generation of foaming in large quantity.

Allow foam to settle down before bath is taken for coating. It is highly desirable to filter the bath material through 600 – 800 mesh to remove any impurities in the bath coming from DM water or apparatus used for making the bath.

After complete homogenization bath may be filtered through filters ranging from 0.2 to 1.0 micron.

**Note:**

- 1) It is recommended to give aging of 2 hours before taking through UF unit and start production.
- 2) For jewelry items (low DFT), it is recommended to make bath with lower solids of 4 to 6 %. (Refractive index = 6.6 – 10.0)
- 3) For lacquer addition into the running bath, it is recommended to take 10 liters of bath solution for mixing of 1 kgs of lacquer.

**B) Procedure for Rinses (Drag-out solution )Preparation:**

**Formula (1000 ml)**

Part A - DM water => 990 ml

Part B - Bath thinner solvent additive 1 => 10 ml

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Total - Bath volume => 1000 ml

**Mixing Procedure:**

Measure exactly 10 ml of Solvent 1 (Part B). Measure 990 ml of DM water in 1.5 liter container (Part A). Add Bath thinner solvent additive 1(Part B) to DM water (Part A) under stirring in 5 minutes. Ensure complete mixing before stirring is stopped.

**Important Note:**

- 1) Ensure proper cleaning of all the apparatus used before making the bath with Solvent -1 followed by rinsing with DM water.
- 2) Use SS / Plastic / Glass apparatus for mixing.

**C) Procedure for use of Dye:**

Any DuPont approved dye (water based / solvent based) or standardized dye solution may be used to impart any specific color to lacquer film as required by customer. But care to be taken to add required quantity of dye to supply resin material and then bath be made.

**Important Note:**

No dye solution should be added directly in the bath as it may not give satisfactory results.

**D) Preparation of rinse aid baths**

Add 1 ml of rinse aid concentrate for 1 liter of rinse bath

**E) Bath conditioning (For Dye baths only)**

- 1) For hardware items where DFT of 10 – 20 microns is required, bath may be aged for 3 – 4 hours before taking for production
- 2) For jewelry items where DFT required is less than 10 microns, bath may be given overnight aging or 40 to 70 % of UF discarding is recommended.
- 3) In specific cases, bath pH may be brought down to 4.2 – 4.5 for uniformity in color.

## F) Bath Conductivity control

Conductivity of the bath rises continuously on regular production. Regular dumping of permeate is recommended to control the conductivity. Though the conductivity limit is 1100 microS / cms , it is recommended to control it below 900 microS/ cms.

**Bath solvent level needs to be adjusted after dumping ultra-filtrate.**

7 – 8 ml of bath thinner solvent additive 1 to be added per 1 liter of UF dumped.

1 - 2 ml of bath thinner solvent additive 2 to be added per 1 liter of UF dumped.

**Note:**

Exact quantity of permeate to be dumped and solvent compensation varies from plant to plant and may be decided by actual analysis of bath samples after commissioning.

## G) Bath Processing Parameters:

<b><u>Test</u></b>	<b><u>Specification</u></b>	<b><u>Unit</u></b>
Substrate	Surfaces with any kind of plating or pure metal / alloy	
pH value @ 25 deg.C	4.6 – 5.1	
Specific Conductivity @ 25 deg.C	Maximum 1100	micros/cms
Bath solids (120 deg.C / 1 hour)	8 – 10*	%
MEQ value (100 % solids)	38 - 42	mMol
Deposition equivalent	35 - 45	As / grams
Density of solids	1.0 – 1.15	G / cc
Theoretical coverage @10 micron DFT	38 grams of supply material	Meter <sup>2</sup>
Deposition time	30 – 60	seconds
Coating voltage	30 – 120	Volts
Ramp time	5 - 10	seconds
Bath temperature	24 – 26	Deg.C
Coating thickness	5 - 30	Microns
Baking time	160 Deg.C / 25 min. EMT	
Flash off / Predrying zone	Hot air blow (if possible)	

**\*Higher or lower values of bath solids are possible for any specific application**

## H) Mechanical Characteristics of Dry Film:

<b><u>Test</u></b>	<b><u>Specification</u></b>	<b><u>Unit</u></b>
Substrate	Surfaces with any kind of plating or pure metal / alloy	
Colour	colourless	
Gloss / clarity *	High gloss and clarity	
Adhesion (1 mm * 1 mm)	Passes 100 %	
Pencil hardness (Mitsubishi)	2H – 4H	
Cupping Test (DIN –ISO 1520)	> 6	mm
Mandrel bend test (DIN –ISO 1520)	Passes 6.0	mm
Impact resistance 980 g / 20 cm / 2 inch	Passes Direct / Indirect	

**Note:**

- 1) It is recommended to check hardness and perspiration cycle test after 72 hours of coating of surface.

**I) Chemical Characteristics of Dry Film:**

<b><u>Test</u></b>	<b><u>Specification</u></b>	<b><u>Unit</u></b>
Substrate	Surfaces with any kind of plating or pure metal / alloy	
Acetone rub	Passes Min. 100 double rubs	
Acid resistance (N / 10 HCl)	Passes Min. 48 dip	Hours
Alkali resistance (N / 10 NaOH)	Passes Min. 48 dip	Hours

**J) Corrosion Protection of Dry Film:**

<b><u>Test</u></b>	<b><u>Specification</u></b>	<b><u>Unit</u></b>
Substrate	Surfaces with any kind of plating or pure metal / alloy	
Salt spray test (ASTMB 117)	Passes Min. 48	Hours
Water resistance (IS 101)	Passes Min. 100	Hours
Humidity resistance (IS 101)	Passes Min. 100	Hours

**Note:**

Lacquer film DFT = min. 15 microns

**K) Outdoor Durability of Dry Film:**

<b><u>Test</u></b>	<b><u>Specification</u></b>	<b><u>Unit</u></b>
Substrate	Surfaces with any kind of plating or pure metal / alloy	
Weather –o-meter sunshine	Min. 1000	Hours
Xenotest 150	Min. 1000	Hours

**Note:**

- 1) Performance of lacquer is dependant upon quality of electroplating and substrate processing parameters. Incase of coatings with dye, outdoor durability of coating depends on light-fastness of dye used.
- 2) This is general procedure for bath commissioning. DuPont technical person should be consulted before commissioning for possible variations in this procedure for specific application.

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**Issue:**

This issue cancels all previous data sheet issues