



Technical Notes M001

“ Operating suggestions for the measurement of
trace moisture in plastics ”

January 2005

Purpose of Operation:

Trace moisture measurement in plastics is one of the important inspection items. Careful operation is needed to protect dried plastics from being affected by moisture absorption.

Apparatus:

Coulometric Moisture Meter CA-100 (Mitsubishi Chemical Corporation)
 Water Vaporizer VA-100 (Mitsubishi Chemical Corporation)
 Upright Sampling Bottle (Mitsubishi Chemical Corporation)
 Trace Sampling Bottle (Mitsubishi Chemical Corporation)
 Aquamicon AX, Aquamicon CXU (API Corporation)
 Aquamicon Solid Water Standard (API Corporation)
 Glove bag, Portable psychrometer, Balance, Spatula, Aluminum foil
 Dried air, Micro syringe (10ul)
 Self-protective equipment

Measurement Condition:

Parameters of Moisture Meter:

Delay: 2, Purge-Preheat-Cooling: 1-2-2, End Sens: 0.1

Temperature: Adjust accordingly to the types of plastics.

Procedures:

Operation		Remarks
	1) Set a portable psychrometer, an upright sampling bottle, a spatula and a plastic sample inside the glove bag. Then blow in dried air (several liters/min) to keep the humidity below 20% inside the bag.	
	2) Aquamicon AX and CXU are charged into the anode and cathode chambers of an electrolysis cell. Set the proper parameters, and then press the titration key for commencing dehydration.	PET resins: Delay: 2 End Sens: 0.1 Print Form: 3 Calc Form: 1 VA Temp: 230 P-P-C: 1-2-2
	3) Confirm that the system is parched by checking the back ground level (B.G.).	B.G. 0.2ugH2O/sec or preferably less than 0.1ugH2O/sec.

 	4) Use 70-110mg of Aquamicon Solid Water Standard at 190-210 deg C or 5ul of distilled water at 120 deg C to verify the system's accuracy. 5) Take 3-5g of the sample using a thoroughly dried upright sampling bottle inside the bag. Put the lid on the sampling bottle, take it out sealed bottle and accurately weigh the sampling bottle with the sample in it. 6) Quickly transfer the sample to a sample boat with a piece of aluminum foil spread over it and press the titration key for commencing measurements. 7) Go back to 5) and repeat measurements several times by replacing the old piece of aluminum foil by a new one each time.	Refer to "How to Use Aquamicon Solid Water Standard." 
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Note:

Guideline for sample size:

Anticipated moisture content	Amount of Sample
30ppm or lower	5g
30-300ppm	3-5g
300-3000ppm	1-3g
3000ppm or higher	0.3-1g

When the moisture content of the sample is less than 300ppm or when the sample is highly hygroscopic, it is recommended that a glove bag or a glove box be used for preventing moisture absorption.