



TECHNICAL DATA SHEET

BI-792

(Blocked Isocyanate water dispersion crosslinking agent)

BI792 is a blocked isocyanate, which is stable at room temperature, however dissociates to regenerate isocyanate functionality under the influence of heat.

A temperature over 120°C (248 °F) is necessary to release the blocking agent, which will volatilize from the coating. The resulting isocyanate can react with active hydrogen-containing compounds to form more thermally stable urethane or urea linkage BI-792 can be added directly to most waterborne formulations with mild agitation and can be

utilized in leather, inks, and for metal.
$$\text{BL} - \overset{\text{O}}{\parallel} \text{C} - \underset{\text{H}}{\text{N}} - \text{R} - \underset{\text{H}}{\text{N}} - \overset{\text{O}}{\parallel} \text{C} - \text{BL} \xrightarrow{\text{HEAT}} \text{OCN} - \text{R} - \text{NCO} + 2\text{H} - \text{BL}$$
 coatings for wood, adhesives, textiles waterborne coatings

FEATURES

- Curing Temperatures over 120°C (248 °F)
- Long Pot-Life for 1K system
- VOC Free
- Excellent Adhesion
- Excellent Water Resistance

APPLICATION- Crosslinking agent for waterborne system

- Paints & Coatings
- Adhesives
- Pressure Sensitive Adhesives Nonwoven Fabric Binders Textile Treatment

TYPICAL PROPERTY

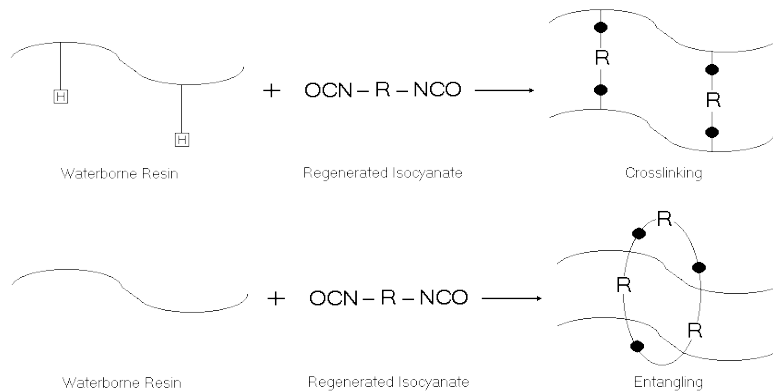
Appearance	White liquid
Solid Content	40%
Ionic nature	Nonionic
NCO Type	Aromatic
Specific Gravity (25°C)	1.04
Dissociation temperature	120°C
pH(5% a.q.solution)	5.5-8.0



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CROSSLINKING MECHANISM

Upon heating, the isocyanate groups are unblocked and become available to react with active hydrogen groups. The reaction between the isocyanate group and an active hydrogen group is a very effective curing mechanism. The reaction proceeds via either pathway:



FORMULATIONS

BI-792 blocked isocyanate can usually be added directly to waterborne formulations containing active hydrogen groups. In general, waterborne systems with high pH (>8) will increase the dissociation speed during curing however, may shorten the pot-life of the overall system. Typically, levels of 5 to 15 percent by weight, and cure conditions of several minutes at elevated temperature, are required. It should be noted that BI-792 blocked isocyanate does not react the same with every waterborne polymer.

Effect of pH:

The correlation between dissociation speed of BI-792 and pH of treatment bath is described in the following drawing, when the bath pH is 8 or higher, the dissociation speeds up and the target performance can be achieved at lower temperature.



Effect of dissociation catalyst.

Effective catalyst is zinc acetate, sodium hydrocarbonate and tertiary amine. Zinc acetate shows the most effective in lowering temperature. When 10% zinc acetate water solution is added by 2.5-10% to BI-792, the dissociation temperature becomes approximately 20°C lower.



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PERFORMANCE of BI-792

Improving Durability of Water-Reducible Fluoropolymers

BI79 can be used to improve the durability of a water-reducible fluoropolymer’s oil and water repellency. Specifically, improvements in physical abrasion resistance and wash durability can be observed at levels as low as 2.5 % by weight as illustrated by the following evaluation:

(A) Reference Formulation		(B) Blocked Isocyanate Formulation	
APG-5272 ⁽¹⁾	6.7 %	APG-5272	6.7%
Water	93.3%	BI792	2.5%
		Water	90.8%

(1) : Supplied by Advanced Polymer, Inc. , NJ

Application Conditions:

Wet pick-up – 56% (pad applied @ 84psi)

Dry/cure – 300°F x 3 minutes

Test Conditions:

Wash Time12 minutes
Wash Temperature98°F
Rinse Time8 minutes
Rinse Temperature55°F
Total load 4 lbs.

Weight of Tide® detergent..66g
Dry Time40 minutes Dry
Temperature.....135°F-147°F
Cooling Time.....5 minutes

Test method – AATCC Test Method 135-2001

Each formulation was pad applied to 50/50 cotton polyester then dried, cured and tested for initial water repellency, oil repellency and water spray rating. After the initial test the treated fabric was laundered in a home washing machine, dried in a home dryer, and retested for water repellency, oil repellency and spray rating.

Result

(A) Reference Formulation				(B) Blocked Isocyanate Formulation			
Wash Cycle	Water	Oil	Spray	Wash Cycle	Water	Oil	Spray
Initial	11	6	100	Initial	11	6	100
1	9	5	80	1	9	6	90
2	7	3	70	2	9	5	90
3	7	3	70	3	9	5	80
4	4	2	70	4	9	4	70
5	3	2	50	5	7	4	70

The higher the number the lower the surface tension and the harder it is for the treated substrate to resist wet-out.

PACKAGING

BI792 is available in 8 oz. sample , 5 gallon and 55 gallon drums.



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