

Eastman AP 550-1 nonchlorinated polyolefin adhesion promoter (25% solids in Aromatic 100 or xylene)

Eastman AP 550-1 is a nonchlorinated polyolefin (NCPO) adhesion promoter supplied at 25% solids in either Aromatic 100 or xylene. Eastman AP 550-1 NCPO can be used as an adhesion promoter for polypropylene (PP) and thermoplastic olefin (TPO) substrates. Eastman AP 550-1 NCPO adhesion promoter provides excellent adhesion and gasoline-resistance properties when used as an adhesion promoter for both 2-part polyurethane and 1-part melamine-based topcoats applied to PP and TPO substrates.

Typical properties^a

% solids	25.0
Gardner color	4
Free maleic	<0.1%
Haze (mL/g-cm at 700 nm)	1–3
Acid no. (corrected for 100% solids)	40
Wt/vol	7.32 lb/gal

^aProperties reported here are typical of average developmental lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

Solubility

Eastman AP 550-1 NCPO is soluble in aromatic hydrocarbon solvents such as xylene, toluene, and Aromatic 100. Cyclic hydrocarbon solvents such as methylcyclohexane and ethylcyclohexane can be used to dilute Eastman AP 550-1. It is not soluble in aliphatic hydrocarbons, esters, ketones, or alcohols but can be diluted, as supplied, with some long-chained ketones and esters such as methyl amyl ketone and *n*-butyl propionate. When diluting Eastman AP 550-1 NCPO with long-chained ketones and esters, the solutions may appear hazy. This haze does not affect the product's ability to promote adhesion to PP or TPO.

Compatibility

Table 1 shows the compatibility of Eastman AP 550-1 NCPO with a variety of coating resins.

Table 1. Eastman AP 550-1 NCPO (25% in xylene) resin compatibility

Notebook #	Duramac™ HS 207- 2706	Polymac™ HS 057- 5776	Polymac HS 220- 2010	Polymac HS 057- 5789	Desmophen® 670A 80 ^a	Paraloid® AUX608X ^b	Acrylamac™ 232-1700	Cymel® U-80 ^c	Cymel 303 ^c	Xylene	AP 550-1 (25%) ^d	9:1	1:1
1	6.26	—	—	—	—	—	—	—	—	73.7	20.0	—	•
2	11.26	—	—	—	—	—	—	—	—	84.7	4.0	•	—
3	6.26	—	—	—	—	—	—	—	—	73.7	20.0	—	•
4	11.26	—	—	—	—	—	—	—	—	84.7	4.0	•	—
5	—	5.88	—	—	—	—	—	—	—	74.1	20.0	—	•
6	—	10.58	—	—	—	—	—	—	—	85.4	4.0	•	—
7	—	5.88	—	—	—	—	—	—	—	74.1	20.0	—	•
8	—	10.58	—	—	—	—	—	—	—	85.4	4.0	•	—
9	—	—	6.66	—	—	—	—	—	—	73.3	20.0	—	•
10	—	—	12.00	—	—	—	—	—	—	84.0	4.0	•	—
11	—	—	6.66	—	—	—	—	—	—	73.3	20.0	—	•
12	—	—	12.00	—	—	—	—	—	—	84.0	4.0	•	—
13	—	—	—	5.88	—	—	—	—	—	74.1	20.0	—	•
14	—	—	—	10.58	—	—	—	—	—	85.4	4.0	•	—
15	—	—	—	5.88	—	—	—	—	—	74.1	20.0	—	•
16	—	—	—	10.58	—	—	—	—	—	85.4	4.0	•	—
17	—	—	—	—	—	—	—	5.20	—	74.8	20.0	—	•
18	—	—	—	—	—	—	—	9.38	—	86.6	4.0	•	—
19	—	—	—	—	—	—	—	5.20	—	74.8	20.0	—	•
20	—	—	—	—	—	—	—	9.38	—	86.6	4.0	•	—
21	—	—	—	—	6.26	—	—	—	—	73.7	20.0	—	•
22	—	—	—	—	11.26	—	—	—	—	84.7	4.0	•	—
23	—	—	—	—	6.26	—	—	—	—	73.7	20.0	—	•
24	—	—	—	—	11.26	—	—	—	—	84.7	4.0	•	—
25	—	—	—	—	—	8.34	—	—	—	71.7	20.0	—	•
26	—	—	—	—	—	15.00	—	—	—	81.0	4.0	•	—
27	—	—	—	—	—	8.34	—	—	—	71.7	20.0	—	•
28	—	—	—	—	—	15.00	—	—	—	81.0	4.0	•	—
29	—	—	—	—	—	—	8.34	—	—	71.7	20.0	—	•
30	—	—	—	—	—	—	15.00	—	—	81.0	4.0	•	—
31	—	—	—	—	—	—	8.34	—	—	71.7	20.0	—	•
32	—	—	—	—	—	—	15.00	—	—	81.0	4.0	•	—
33	—	—	—	—	—	—	—	—	5.00	75.0	20.0	—	•
34	—	—	—	—	—	—	—	—	9.00	87.0	4.0	•	—
35	—	—	—	—	—	—	—	—	5.00	75.0	20.0	—	•
36	—	—	—	—	—	—	—	—	9.00	87.0	4.0	•	—

^aResin supplied by Bayer. ^bResin supplied by Rohm and Haas. ^cResin supplied by Cytec. ^dAdhesion promoter used was Eastman AP 550-1 25% in xylene. ^eSamples were heated at 608°C for 1 hour and evaluated the next day.
^fRatings for solutions: C = compatible; I = incompatible; H = hazy

How to use

Eastman AP 550-1 NCPO (25% in Aromatic 100 or xylene) can be used for similar applications as chlorinated polyolefins, which are described in other Eastman publications. Brief descriptions for primer and additive applications follow.

Primer applications

- Clean substrate with isopropyl alcohol.
- Prepare Eastman AP 550-1 NCPO at 5%–10% solids and apply to the substrate at a thickness of 0.1–0.3 mils (2.5–7.5 μ).
- Primer may be air dried or heated at 80°C (176°F) for approximately 10 minutes.
- Topcoats can be applied as soon as the primer has been dried.

Additive applications

- Clean substrate with isopropyl alcohol.
- Add 5%–15% Eastman AP 550-1 NCPO, based on resin solids, to the coating and mix thoroughly.
- Test for compatibility or effect on dry film properties.
- If adequate adhesion is not obtained, increase the amount of Eastman AP 550-1 NCPO until adhesion is obtained. Monitor any effects the addition of more AP 550-1 has on dry film properties.

Performance as a primer

Table 2. Percent retained adhesion of various automotive OEM topcoats on Solvay Sequel[®] 1440 TPO after exposure to Cleveland humidity (ASTM D4585 at 49°C [120°F])

Topcoat	Coating bake temperature, °C (°F)	Time, h	% retained adhesion
1K/1K ^a	121 (250)	300–500	100
1K/2K ^b	121 (250)	504	100
2K/2K ^c	80 (176)	504	100

^a1K/1K = 1-part melamine-cured base coat/1-part melamine-cured clear coat

^b1K/2K = 1-part melamine-cured base coat/2-part polyurethane-cured clear coat

^c2K/2K = 2-part polyurethane-cured base coat/2-part polyurethane-cured clear coat

Table 3. Gasoline resistance (Ford Modified Juntunen) on Solvay Sequel 1440 TPO

Topcoat	Coating bake temperature, °C (°F)	Time, h	% adhesion/ % lifted
1K/1K ^a (silver)	121 (250)	1	100/0
1K/2K ^b (blue)	121 (250)	1	100/0
2K/2K ^c (white)	80 (176)	1	100/0

^a1K/1K = 1-part melamine-cured base coat/1-part melamine-cured clear coat

^b1K/2K = 1-part melamine-cured base coat/2-part polyurethane-cured clear coat

^c2K/2K = 2-part polyurethane-cured base coat/2-part polyurethane-cured clear coat

Ambient conditions	Heated @ 60°C (1 h) ^e	Rating ^f
•	—	H
•	—	I
—	•	I
—	•	I
•	—	C
•	—	C
—	•	C
—	•	C
•	—	H
•	—	I
—	•	I
—	•	I
•	—	C
•	—	C
—	•	C
—	•	C
•	—	C
•	—	C
—	•	C
—	•	C
•	—	I
•	—	I
—	•	I
—	•	I
•	—	I
•	—	I
—	•	I
—	•	I
•	—	C
•	—	C
—	•	C
—	•	C

Storage and handling

Because of limited solubility, solutions of Eastman AP 550-1 NCPO may partially settle over time. Should this occur, warming the contents to approximately 38°–49°C (100°–120°F) with mild agitation while keeping away from sparks and open flames will generally return the product to its original condition.

Warning: When handling or mixing nonpolar solvents such as Aromatic 100, xylene, or toluene, static electricity can build up.



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