TECHNICAL UPDATE

CRAY VALLEY
Hydrocarbon Specialty Chemicals

Norsolene® W-Series
Water White Hydrocarbon Resins

Benefits

- Colorless and odorless
- Good thermal stability
- Good tackifying and reinforcing properties

Description

Norsolene® W-Series resins are “water white” resins manufactured from pure aromatic monomers. Colorless and odorless, these are tackifying and reinforcing resins used for mastics, EVA-based hot melt adhesives, and thermoplastic rubber-based adhesives. Their thermal stability makes them particularly suitable for high-quality bookbinding, hygiene applications, and packaging for luxury goods.

Product Features

Product	Class	Suggested Applications	Features & Benefits
W85	Water white pure aromatic hydrocarbon resin	Hot melt adhesive; hot melt coating	Low color; low odor; good tackifying and reinforcing properties; good thermal stability
W90	Water white pure aromatic hydrocarbon resin	Hot melt adhesive; hot melt coating	Low color; low odor; good tackifying and reinforcing properties; good thermal stability; excellent hot tack
W100	Water white pure aromatic hydrocarbon resin	Hot melt adhesive; hot melt coating; pressure sensitive adhesive	Low color; low odor; good tackifying and reinforcing properties; good thermal stability
W110	Water white pure aromatic hydrocarbon resin	Hot melt adhesive; hot melt coating; pressure sensitive adhesive	Low color; low odor; good tackifying and reinforcing properties; good thermal stability; excellent hot tack

TECHNICAL UPDATE

Norsolene® W-Series Water White Hydrocarbon Resins

CRAY VALLEY
Hydrocarbon Specialty Chemicals

Product Properties

Product	Softening Point, °C	Acid Number	Color, (G=Gardner)	Specific Gravity @ 20 °C
W85	80	<0.1	<1G	1.06
W90	90	<0.1	<1G	1.06
W100	100	<0.1	<1G	1.06
W110	110	<0.1	<1G	1.06

*The listed properties are illustrative only, and not product specifications. Cray Valley disclaims any liability in connection with the use of the information, and does not warrant against infringement by reason of the use of its products in combination with other materials or in any process.

Norsolene W-Series Performance Studies

The W-Series products are evaluated below in a packaging adhesive application and a pressure sensitive adhesive application.

FORMULATION #1 – PACKAGING ADHESIVE		
WT.%	**COMPONENT**	**DESCRIPTION**
49.5	Norsolene W-Series	Water white pure aromatic hydrocarbon resin
30	EVA	Ethylene vinyl acetate vinyl acetate = 28% melt index = 420
20	Paraflint H2	“Hard” synthetic wax by Schumann Sasol
0.5	Irganox 1010	Antioxidant by Ciba Specialty Chemicals

PERFORMANCE – METHOD			
Norsolene Resin	W90	W100	W110
Softening Point, °C	112	113	113
Cloud Point, °C	140	205	220
Elongation @ Break (in traction), %	37	19	15
Stress @ Break (in traction), MPa	3.3	3.9	3.6
Young’s Modulus (in traction), MPa	135	115	115
Tear Strength (Beech), MPa	2.8	2.3	2.6
Type of Break	Cohesive	Cohesive	Cohesive

FORMULATION #2 – PRESSURE SENSITIVE ADHESIVE		
PARTS	**COMPONENT**	**DESCRIPTION**
10	Norsolene W100	Water white pure aromatic hydrocarbon resin
35	SBS	Styrene-butadiene-styrene resin
40	Aliphatic resin (R&B=95 °C)	Aliphatic resin
12	Catenex N956	Plasticizer by Shell
0.5	Irganox 1010	Antioxidant by Ciba Specialty Chemicals

PERFORMANCE – METHOD	
Peel Strength @ 180°	70 N/25 mn
Peel Strength @ 90°	45 N/25 mn
“Quick Stick”	10 N/25 mn
Resistance @ 60 °C under a mass of 1 kg	21 mn
S.A.F.T.	85 °C

Methods

Softening Point

Softening point temperature is measured using ISO #4625 (Ring-and-ball method).

Coloration

Resin coloration is measured in a 50% toluene solution using ISO #4630 (Gardner scale). Hot melt adhesive coloration is measured at the “in mass” melted state using the Gardner scale.

Mechanical Properties in Traction

The mechanical properties in traction are measured on a dynamometer. The traction speed is generally 5 mm/min, and the environmental conditions are 23 °C and 50% relative humidity. Elongation at break, stress at break and Young’s modulus are measured.

Tear Strength

The hot melt, at a temperature in excess of 200 °C, is deposited on a surface of approximately 6 cm^2, in the middle of a plank of beech wood of dimension 100 mm x 20 mm. A second plank with a surface of approximately 6 cm^2 is applied by manual pressure on the coated part of the first plank. After 24 hours of rest, the test-piece is cut in its middle through half of its thickness using a fine saw blade. The test piece is then subjected to a movement of traction, at a speed of 5 mm/min. Shearing breaking stress (Mpa) is thus obtained.

CRAY VALLEY
Hydrocarbon Specialty Chemicals

Peel Strength

The purpose of the peeling test is to measure the adherence on different rigid substrates. A strip of hot melt is poured through a window/mould onto a rigid substrate. This strip is reinforced by a glass mat to avoid distortion of the hot melt during the test. The strip of hot melt is subjected to peeling in a dynamometer at a constant speed of 150 mm/min. The angle of peeling may be 90° or 180°. The adherence is measured as the average peeling force divided by the width of the strip (20 mm).

"Quick Stick"

Determined by the FINAT Test Method (FTM) 9, Loop tack measurement. The hot melt adhesive to be tested is deposited in the quantity of 100 g/m^2 on a film of Mylar 80 micrometers thick and 2 cm wide. A loop of this ribbon, adhesive outside, is fixed to the mobile jaw of a dynamometer, then placed in contact with a stainless steel plate (NFX 41022) on a surface of 5 cm^2. The tack is the maximum force, divided by two, observed at the instant of detachment, with the mobile jaw moving at a speed of 300 mm/min.

S.A.F.T. (Shear Adhesion Failure Temperature)

This test determines the temperature at which a material stuck on a substrate and subjected to a constant load fails and falls. The bonding surface is 2 cm^2. The load is a 500 g weight. The samples are stored 24 hours at ambient temperature before the test. After two hours at 55 °C, the climb in temperature is +5 °C/hr.