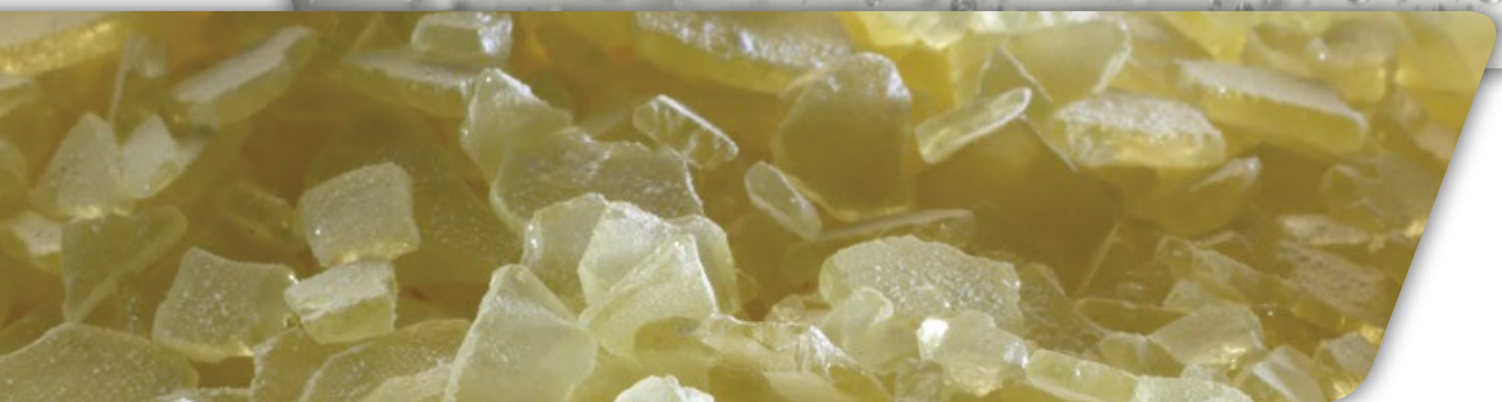


CRAY VALLEY

A BRAND OF  TOTAL

Clartack® W Resins





Glossary

Specifications & Typical Properties

4

Other Typical Properties

- Solubility
- Compatibility
- Heat Stability

Examples of End-Use Applications

9

Packaging
Bookbinding
Pressure Sensitive Adhesive

Packaging & Safety Data Sheets

10

Clear tack® Resins W85, W90, W100 and W110 are water-white, low odor and heat resistant. Clear tack W resins are produced by cationic polymerization of pure styrenic monomers.

1.0 Specifications

	Clear tack			
	W85	W90	W100	W110
Softening point : °C (Ring & Ball – ISO 4625)	80-88	85-95	95-105	105-115
Color, Hazen (Hz)	<40	<40	<40	<40

2.0 Typical Properties

	Clear tack			
	W85	W90	W100	W110
Softening point : °C (Ring & Ball – ISO 4625)	80-88	85-95	95-105	105-115
Color: Gardner (50% in Toluene – ISO 4630)	<1	<1	<1	<1
Color, Hazen	<10	<10	<10	<10
Acid Number	<0.1	<0.1	<0.1	<0.1
Saponification Number	<1	<1	<1	<1
Density	1.05-1.07	1.05-1.07	1.05-1.07	1.05-1.07

Other Properties are shown in Table 1 in Section 2.2.

2.2 Other Typical Properties

Table 1	Cleartack			
	W85	W90	W100	W110
Ring & Ball (°C)	80-88	85-95	95-105	105-115
Thermal stability at 177 °C * (Gardner neat coloration)				
0.5 h		<1		
1 h		<1		
2 h		<1		
3 h		<1		
4 h		<1		
5.5 h		<1		
7 h		<1		
24 h		<1		
48 h		<1		
72 h		<1		
96 h		1		
EVA compatibility (Cloud point in °C)				
EVA 40 - 60		< 20	< 20	100
EVA 33 - 400		70	180	200
EVA 28 - 400		130	200	Incompatible
EVA 28 - 6		180	Incompatible	Incompatible
EVA 25 - 400		170	Incompatible	Incompatible
EVA 18 - 500		225	Incompatible	Incompatible
Isododecane Cloud Point, °C (50% by weight)				
		30	50	65
Viscosity (mPa.s)				
150°C	600	700	2000	5700
175°C	130	160	350	750
200°C	-	50	90	160
Molecular Weight (GPC)				
Mn	600	650	750	850

*ASTM D 1544

2.3 Cleartack W Resins: Solubility and Compatibility

The following data are given as a general indication.

Cleartack W resins are soluble in most commonly used solvents:

- Aliphatics such as methylcyclohexane, turpentines, terpenes
- Aromatics such as Toluene and Xylene
- White spirits, containing low to no aromatics
- Chlorinated solvents
- Common esters and ketones
- Typical plasticizers: dioctyl phthalate, dioctyl adipate
- Oils and drying oils

Cleartack W resins are insoluble in low molecular weight alcohols, typically methanol, ethanol, isopropanol and glycols.

Cleartack W resins are compatible with:

- Ethylene vinyl acetate copolymers (EVA) used in adhesives
- Styrenic block copolymers (SBS, SIS, SEBS)
- Polychloroprene and polyvinylchloride (PVC)
- Alkyd resins, chlorinated paraffins and rubber/natural rubbers
- Other resins like rosins and rosin derivatives, polyterpenic
- "C9" aromatic and "C5" aliphatic hydrocarbon resins
- Ethylcellulose and ethylhydroxycellulose, but are incompatible with nitrocellulose.

Detailed compatibility with styrenic block copolymers (SBC) is shown in Table 2

Compatibility is observed as the transparency of a film formed on a glass plate; this film is obtained by evaporation of a toluene solution containing resin and SBC.

Table 2

	Cleartack			
	W85	W90	W100	W110
Ring & Ball (°C)	85	90	100	110
Thermoplastic Rubber Compatibility				
Compatibility with SBS				
Ratio Resin / Rubber				
25 / 75	Compatible	Compatible	Compatible	Compatible
50 / 50	Compatible	Compatible	Compatible	Compatible
75 / 25	Compatible	Compatible	Compatible	Compatible
Compatibility with SIS				
Ratio Resin / Rubber				
25 / 75	Compatible	Compatible	Compatible	Compatible
50 / 50	Compatible	Compatible	Compatible	Compatible
75 / 25	Compatible	Compatible	Incompatible	Incompatible
Compatibility with SEBS				
Ratio Resin / Rubber				
25 / 75	Incompatible to Light Haze	Incompatible to Light Haze	Incompatible to Light Haze	Incompatible to Light Haze
50 / 50	Compatible	Compatible	Light Haze	Light Haze
75 / 25	Compatible	Compatible	Compatible	Compatible

2.4 Cleartack W Resins Have Outstanding Thermal Stability

Table 3 contains the color of resin samples initially and after heating Cleartack W resins in a forced air oven at 177 °C during 96 hours.

Regular checks were made over a one year storage period. The resin was stored under normal conditions i.e. packaging, ambient temperature and light.

RESULTS:

With Cleartack W resins, no skin formation was ever observed.

Storage Duration (Month)	Cleartack											
	W85 - W90				W100				W110			
	0	3	6	12	0	3	6	12	0	3	6	12
Time	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
.5 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
5.5 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
24 h	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
48 h	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
72 h	1	1	1	1.5	<1	<1	<1	<1	<1	<1	<1	<1
96 h	1	1.5	1.5	1.5	<1	<1	1	1	1	1	1	1

Raw Material Used for the Next Survey in Section 3.0

Adhesive Composition

Paraffin 62-64	TOTAL	(paraffin)
Spirdane®	TOTAL	(Solvents)
Solvarex®	TOTAL	(Solvent)
Irganox® 1010	CIBA	(antioxidant)
Parafint® H2	SCHUMANN	(synthetic wax)
Catenex	SHELL	(naphthenic solvent)

3.0 Examples of Cleartack Resins End-Use Applications

3.1 Packing Adhesive

Hot-Melt Adhesive Composition

	(mass)
Cleartack W Resin	49.5
EVA 28-420	30
Parafint H2	20
Irganox 1010	0.5
	<hr/>
	100

RESULTS:	Cleartack		
	W90	W100	W110
R&B (°C)	112	113	113
Cloud point (°C)	140	205	220
Elongation at break (%)	37	19	15
Stress at break (MPa)	3.3	3.9	3.6
Stress at yield (MPa)	3.6	3.9	3.6
Young's modulus (MPa)	135	115	115
Shear strength on beech (MPa)	2.8	2.3	2.6
Rupture type	cohesive	cohesive	cohesive

3.2 Bookbinding

Hot-Melt Adhesive Composition

	(mass)
Cleartack W Resin	33
EVA 28-05	33
Paraffin 62-64	33.5
Irganox 1010	0.5
	<hr/>
	100

RESULTS:	Cleartack		
	W90	W100	W110
R&B (°C)	75	75	75
Cloud point (°C)	100	150	180
Elongation at break (%)	560	130	100
Stress at break (MPa)	5.0	3.8	4.0
Stress at yield (MPa)	4.5	4.7	4.8
Young's modulus (MPa)	110	125	115
Shear strength on beech (MPa)	3.7	4.0	4.0
Rupture type	cohesive	cohesive	cohesive & adhesive

3.3 Pressure Sensitive Adhesive

Adhesive Composition

	(mass)
Cleartack W-100 Resin	10
Aliphatic Resin	40
SIS	35
Catenex N 956	12
Irganox 1010	0.5
	<hr/>
	100

RESULTS:	Cleartack	
	W100	
Peel at 180 °C (N/25 mm)	70	
Peel at 90 °C (N/25 mm)	45	
Quick stick tack (N/25 mm)	10	
Holding power (1kg, 60 °C) (min)	21	
S.A.F.T. (°C)	85	

4.0 Packaging

Clartack W resins are delivered pastillated and packed in 25 kg polyethylene bags on wrapped pallets of 55 bags weighing 1375 kg net.

5.0 Safety Data Sheets

Safety Data Sheets (SDS) are available on the TOTAL Cray Valley website:

<http://www.crayvalley.com>

These results obtained in our laboratory are given in good faith according to the method used and the samples checked. The values cannot be used to set specifications. They are indicated without TOTAL Cray Valley's guarantee or liability. All given formulations are starting formulations and they are indicated without TOTAL Cray Valley's guarantee or liability. They are based on our present technical knowledge and experience. They do not relieve processors of the responsibility of carrying out their own tests and experiments, because many factors that could influence the result may arise during processing and application; neither do they imply and legally binding assurance of certain properties or of suitability for a specific purpose. Any proprietary should be respected.

Shelf life: Clartack resins are inert and stable. Their shelf life mainly depends on the storage conditions and end use. Their average shelf life is about 2 years. This average shelf life is given without TOTAL Cray Valley's guarantee because TOTAL Cray Valley does not control end uses and the storage conditions at customers.

Storage: All resins with a low softening point present a risk of solidifying, which increases in hot weather. Therefore for softening points of less or equal to 100 °C, we recommend: storage in a cool (25 °C max), ventilated area, out of the sunlight; do not stack pallets; avoid storage for prolonged period.

CRAY VALLEY

A BRAND OF  TOTAL

www.crayvalley.com

Email: Ext-TechSupport@total.com

AMERICAS

TOTAL Cray Valley (TCV)
Eagleview Corporate Center
665 Stockton Drive, Suite 100
Exton, PA 19341
USA

Tel: 877.US1.CRAY (877.871.2729)

Fax: 610.363.4198

EUROPE & AFRICA

TOTAL Cray Valley (TCV)
Usine de Carling Saint-Avold
BP 90290 / RN 33
57508 Saint-Avold Cedex
France

Tel: +33.147.96.98.50

Fax: +33.147.86.99.81

ASIA

TOTAL Cray Valley (TCV)
Chemical Co., Ltd.
Room 2507-09
The South Securities Building
No. 140-148, Tiyu Dong Rd.
Tianhe District
Guangzhou 510620 P.R. China

Tel: +86.20.38879156

Fax: +86.20.28878495



The information in this bulletin is believed to be accurate, but all recommendations are made without warranty since the conditions of use are beyond TOTAL Cray Valley's control. The listed properties are illustrative only and not product specifications. TOTAL 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 material or in any process.

