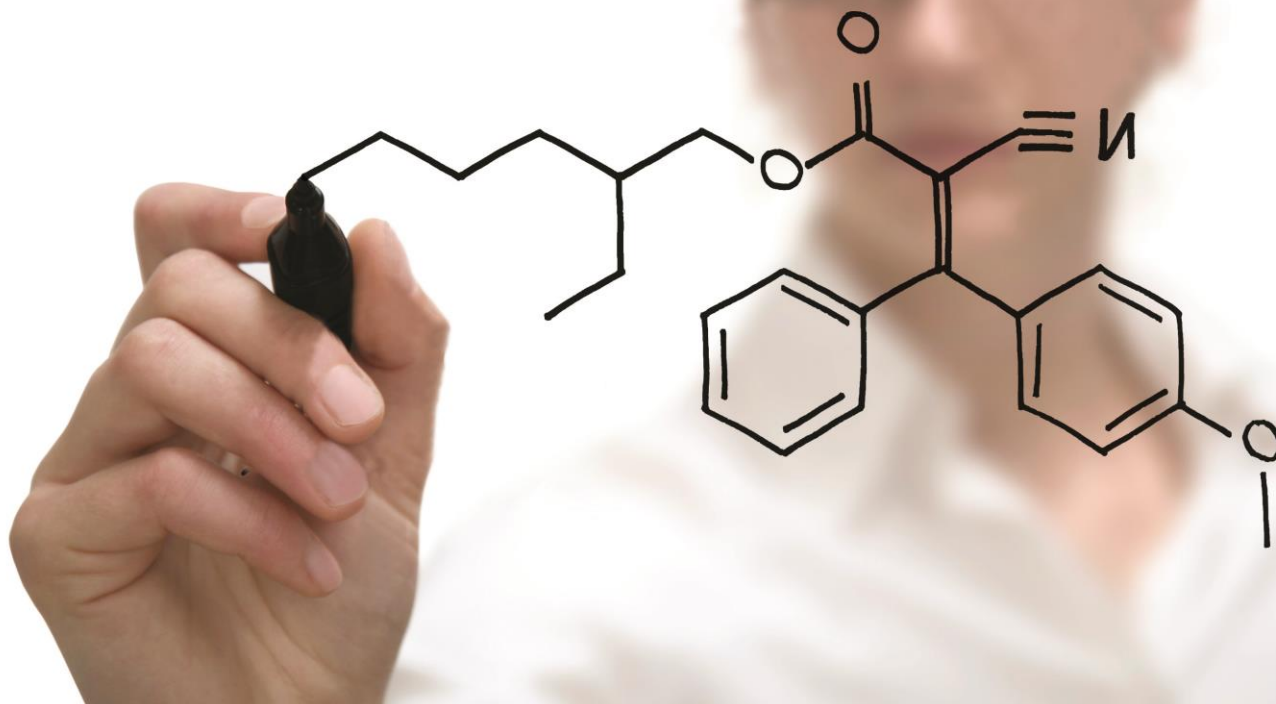


Hallstar Ester Plasticizers for Acrylic Sealants



Performance Advantages in Acrylic Sealants

Plasticizers for modification of Acrylic & Polyacrylate Sealants

- Advantages include: Dry to touch, Peel Strength, Tack Time, Low temperature performance

Formulation

Acronal® 81D	100 phr
Calcium Carbonate	115 phr
Mineral Spirits	5 phr
Ethylene Glycol	5 phr
Plasticizer	25 phr

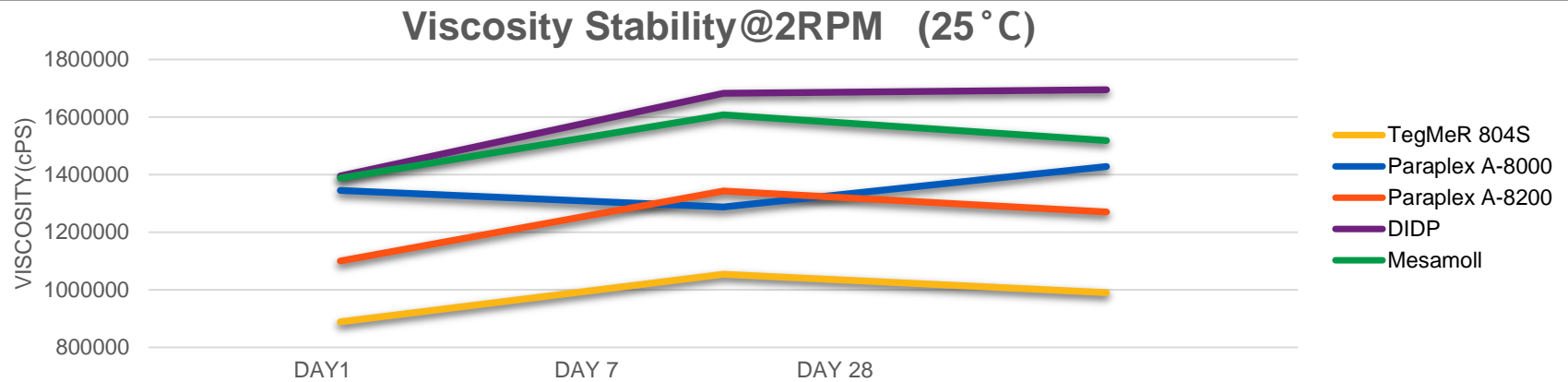
Acronal® is a registered trademark of BASF AG

Plasticizers Evaluated

TegMeR® 804S(PEG ester)
Paraplex® A-8000 (Polymeric ester)
Paraplex® A-8200 (Polymeric ester)
Diisodecyl Phthalate(DIDP)
Alkyl Sulfonic Ester



Performance Advantages in Acrylic Sealants



- Hallstar Aliphatic Esters- lower viscosity/ faster extrusion, even polymeric

PLASTICIZER	TegMeR	Paraplex	Paraplex	DIDP	Alkyl Sulfonic Ester
	804S	A-8000	A-8200		
<u>Slump - ASTM D2202</u>					
Average, mm	0.8	0.5	0	0	0
<u>Flow - ASTM C639</u>					
Self Leveled (Y/N)	N	N	N	N	N
Average Flow , mm	0.5	0.5	0	0	0
<u>Heat Aging, 21 days @ 70°C - ASTM C792</u>					
Weight Loss, %	11.6	11.1	10.9	10.7	12.1
Cracking and Chalking	0	0	0	0	0
<u>28 day Heat Aging</u>					
Weight Loss, %	4.2	3.6	3.5	3.5	3.8
Cracking and Chalking	0	0	0	0	0



Performance Advantages in Acrylic Sealants

PLASTICIZER	TegMeR 804S	Paraplex A-8000	Paraplex A-8200	DIDP	Alkyl Sulfonic Ester
Tack Time - ASTM C679, minutes	45	65	70	80	90
28 days, minutes	75	65	70	70	90
<u>Original Physical Properties</u>					
<u>Samples conditioned 3 days at RT, 4 days at 50°C</u>					
Stress @ 100% Elong. MPa	0.3	0.4	0.4	0.3	0.4
psi	38	55.2	56.6	36.6	55.7
Tensile Strength, MPa	0.3	0.4	0.5	0.4	0.5
psi	48	64.2	72.5	53.7	75.7
Elongation @ Break, %	167	228	240	246	250
Hardness Duro A, pts.	4	17	19	7	12
Tg by DSC, °C	-81.8	-66.6	-58.7	-69.8	-65.1
Feel	tacky	smooth/dry	smooth/dry	tacky	tacky
<u>28 day Physical Properties</u>					
<u>Samples conditioned 3 days at RT, 4 days at 50°C</u>					
Stress @ 100% Elong. MPa	0.3	0.3	0.5	0.4	0.4
psi	39.1	47	72.2	56.7	58
Tensile Strength, MPa	0.4	0.4	0.6	0.6	0.6
psi	52.5	64.3	94.1	87.6	86.3
Elongation @ Break, %	185	228	245	280	250
Hardness Duro A, pts.	5	13	20	8	10
Tg by DSC, °C	-81.9	-66	-58.6	-70.4	-54.5
Feel	tacky	smooth/dry	smooth/dry	tacky	tacky

Performance Advantages in Acrylic Sealants

	TegMeR 804S	Paraplex A-8000	Paraplex A-8200	DIDP	Alkyl Sulfonic Ester
<u>Adhesion-in-Peel ASTM C794</u>					
Sealant Type	II	II	II	II	II
Initial Aluminum					
Dry - Average, pli	2.61	5.61	11.59	2.36	4.28
Type of Failure	adhesive	adhesive	cohesive	adhesive	adhesive
7- day Water Immersion, Average, pli					
Dry - Average, pli	2.12	0	0.71	0	1.64
Type of Failure	90% adhesive 10% cohesive	70% adhesive 30% cohesive	cohesive	adhesive	90% adhesive 10% cohesive
28 day Aluminum					
Dry - Average, pli	2.53	5.11	6.57	1.93	3.33
Type of Failure	adhesive	adhesive	5% cohesive 95% adhesive	adhesive	adhesive
7- day Water Immersion, Average, pli					
Dry - Average, pli	0	0.04	0.1	0	0.17
Type of Failure	adhesive	adhesive	5% cohesive 95% adhesive	adhesive	adhesive

- Hallstar Aliphatic Polymeric Esters- high adhesive strength

Esters for Acrylate Sealants Summary

Advantages

- Dry to touch=less dirt pick up
 - Paraplex® A-8200, Paraplex® A-8000
- Peel Strength
 - Paraplex® A-8200, Paraplex® A-8000
- Reduced Tack Time, Low Tg
 - TegMeR® 804S



Questions?

www.hallstar.com