PARALOID™ AU-608 TBZ Acrylic Polyol

Low VOC Formulations for Auto Refinish, GIF and Other Conventional Spray Applications, Plus an Airless Spray Maintenance Formulation

Product Description

PARALOID AU-608 TBZ acrylic polyol is supplied at 60% non-volatiles in t-butyl acetate. We anticipate that t-butyl acetate will be de-listed as a VOC. At that time, this product will have VOC <0.4 pounds/gallon. PARALOID AU-608 TBZ acrylic polyol has been designed to give the same performance expected from one of the coating standards, PARALOID AU-608. When properly crosslinked with a recommended aliphatic polyisocyanate, the resultant urethane coating will exhibit the high gloss, durability, excellent hardness/flexibility balance, and chemical resistance expected from a high-performance coating.

You may use PARALOID AU-608 TBZ acrylic polyol wherever you have used the original product, PARALOID AU-608. As the de-listing of t-butyl acetate occurs, further opportunities for use may increase into those applications with severe VOC restrictions. By supplying PARALOID AU-608 TBZ acrylic polyol at potentially low VOC, the formulator has maximum latitude to prepare the best performing coating at the lowest possible VOC.

Formulating Guidelines

The evaporation rate for t-butyl acetate is 2.8 (n-butyl acetate = 1.0). As such, it evaporates faster than toluene, but slower than MEK. Further, its solvent power is slightly less than both. Thus, when formulating, there is a need for better polymer solvency for spraying at higher solids, and a need for a "tail" solvent/diluent that will promote subsequent film formation. To minimize VOC, some acetone and PCBTF (Parachlorobenzotrifluoride) may be used as the better polymer solvent, “tail” diluent, respectively.

Our preliminary starting-point formulations for "clear" film GIF applications vary from 0.4–5.0 lbs./gal. VOC. They employ a mixture of acetone/PCBTF at the lowest VOCs and they utilize PM Acetate or xylene as the VOC rises. The fourth formulation listed is a 2.0 VOC blue tint. Part "A" of this formulation is stable for typical storage conditions prior to mixing in the isocyanate and dilution solvents, which should be done shortly before use. The formula uses Eastman EEP as the "tail" solvent to effect proper spraying and drying characteristics. The listed GIF formulations were sprayed conventionally (35-40 psi) at approximately 25–30% solids, with viscosity of ca. 15-20 seconds on a #2 Zahn cup. Glossy, even, continuous films were obtained. The balance of properties (pot life/dry time, hardness/flexibility, chemical resistance) were similar to our control system, PARALOID AU-608X, a well-known industry standard. The last formulation is a maintenance gloss topcoat for airless spray application.

Formulations included:

- PARALOID AU-608TBZ clear topcoat, VOC = 0.4 lbs./gal.
- PARALOID AU-608TBZ clear topcoat, VOC = 2.0 lbs./gal.
- PARALOID AU-608TBZ clear topcoat, VOC = 5.0 lbs./gal.
- PARALOID AU-608TBZ pigmented blue tint topcoat, VOC = 2.0 lbs./gal.
- PARALOID AU-608TBZ maintenance gloss topcoat for airless spray application

Typical Properties

These properties are typical but do not constitute specifications.

% Non-Volatiles	58-60
Solvent	t-butyl acetate
Viscosity, Brookfield LVT, cP	3000–7000
Density, lbs./gal.	8.46
HEW (hydroxyl equivalent weight)	650
Molecular Weight, weight average	20,000
Tg, °C	55

Typical Film Properties, 14 PVC Blue Tint Formulation (2 MILS Dry On Treated Aluminum)

	PARALOID AU-608X/NCO VOC = 5.4 lbs./gal.	PARALOID AU-608TBZ/NCO VOC = 2.0 lbs./gal.
Gloss, 20°/60°	86 / 92	87 / 94
Pencil Hardness	H	H
Mandrel Flex	Pass 1/8"	Pass 1/8"
Impact Resistance, dir/rev.	70 / 30	60 / 35
Chemical Resistance, 30 min. spots:		
10% HCl, 10% NaOH	OK	OK
Gasoline, motor oil	OK	OK
isopropanol	OK	OK

Unpigmented Clear Topcoat Based On PARALOID AU-608 TBZ VOC - 0.4 Pounds/Gallon Acrylic/Isocyanate: 75/25

Ingredients	Pounds	Gallons
Part A		
PARALOID AU-608TBZ, 58%	330.00	38.80
Acetone	98.00	14.88
PCBTF	98.00	8.86
Catalyst T-12(10% in t-ba)	0.20	0.02
Byk-300	0.40	0.05
Tinuvin 292	2.00	0.20
Raybo 3	0.40	0.05
Part B		
Desmodur N-3300 (100%)	63.40	6.54
Dilute to spray viscosity		
Acetone	127.50	19.32
PCBTF	127.50	11.46
Totals	**847.40**	**100.20**
Weight Solids	30.0%	
Volume Solids	26.3%	
Percent Solvent	**Weight**	**Volume**
Acetone	26.7%	34.2%
PCBTF	26.7%	20.1%
t-butyl acetate	16.3%	19.2%

Unpigmented Clear Topcoat Based On PARALOID AU-608 TBZ
VOC - 2.0 Pounds/Gallon Acrylic/Isocyanate: 75/25

Ingredients		Pounds	Gallons
Part A			
PARALOID AU-608TBZ, 58%		255.1	30.0
Eastman EEP		51.4	6.5
PCBTF		33.8	3.0
t-butyl acetate		36.0	5.0
Catalyst T-12 (10% in t-ba)		0.8	0.1
Byk 300		0.7	0.1
Raybo 3		0.7	0.1
Tinuvin 292		0.7	0.1
Tinuvin 328		2.3	0.2
Part B			
Desmodur N-3300 (100%)		48.5	5.0
Dilute to spray viscosity			
t-butyl acetate		270.0	37.5
Acetone		82.5	12.5
Totals		**782.5**	**100.1**
Weight Solids	25.7%, At Spray Viscosity		
Volume Solids	20.7%, At Spray Viscosity		
NCO/OH ratio	1.1 / 1.0		

Unpigmented Clear Topcoat Based On PARALOID AU-608 TBZ
VOC - 5.0 Pounds/Gallon Acrylic/Isocyanate: 75/25

Ingredients	Pounds	Gallons
Part A		
PARALOID AU-608TBZ, 58%	330.00	38.00
Xylene	133.30	18.52
PM Acetate	42.10	5.22
Catalyst T-12 (10% in t-ba)	0.20	0.02
Byk 300	0.40	0.05
Tinuvin 292	2.00	0.20
Raybo 3	0.40	0.05
Part B		
Desmodur N-3300 (100%)	63.40	6.50
Dilute to spray viscosity		
Xylene	173.30	24.02
PM Acetate	54.65	6.78
Totals	**799.75**	**100.20**
Weight Solids	32.0%	
Volume Solids	26.3%	
Percent Solvent	**Weight**	**Volume**
Xylene	38.4%	42.6%
PM Acetate	12.1%	12.1%
t-butyl acetate	17.4%	19.2%

2.0 VOC Urethane Topcoat, Blue Tint, Based On PARALOID AU-608TBZ

Ingredients	Pounds	Gallons
Part A		
Sand or Media Mill:		
PARALOID AU-608TBZ, 58%	72.3	8.5
Eastman EEP	79.1	10.0
TiO2, Ti-Pure R-960	133.3	4.0
Phthalo Blue	3.7	0.3
Sub-total	288.4	22.8
Letdown:		
t-butyl acetate, P.U. grade	91.8	12.6
PCBTF	45.0	4.0
Metacure T-12 (10% in t-butyl acetate)	0.8	0.1
Byk 300	0.8	0.1
PARALOID AU-608TBZ, 58%	255.1	30.0
Tinuvin 292	2.0	0.2
Raybo 3	1.0	0.1
Above mill base	288.4	22.8
Part "A" Total	682.9	69.9
Part B		
(At point of use, add isocyanate below, then add in Dilution Solvent mix to attain conventional spray viscosity.)		
Polyisocyanate, aliphatic HDI, 100%, HEW=195	63.0	6.5
Sub-total	745.7	76.4
Dilution Solvent Mix:		
t-butyl acetate	63.0	8.7
Acetone	97.0	14.7
Total Paint	**907.7**	**100.0**
Physical Properties:		
Weight Solids, %	43.0	
Volume Solids, %	30.4	
PVC, %	14.2	
NCO/OH , eq.	1.10/1.0	
VOC, lbs./gal. (gm/l)	2.0 (240) at application viscosity = 15-20 sec., #2 Zahn cup	

Starting-Point Maintenance Gloss Topcoat
Based On PARALOID AU-608TBZ Airless Spray Application

	Pounds	Gallons
Component #1		
Sand or Media Mill:		
n-Butyl Acetate, P.U. grade	120	16.3
PARALOID AU-608TBZ, 60%	120	14.2
TiO2, Ti-Pure R-960	260	7.8
Letdown:		
Eastman EEP	80	10.3
PARALOID AU-608TBZ, 60%	340	40.1
Above Mill Base	500	38.3
Metacure T-12, 10% in n-butyl acetate	1	0.1
Tinuvin 1130	6	0.7
Tinuvin 292	3	0.3
Raybo 3	1	0.1
Byk 300	1	0.1
Sub-Total Component #1	932	90.0
Component #2		
(At point of use, mix solvent and isocyanate below, then mix in with Component #1.)		
n-Butyl Acetate, P.U. Grade	8	
Polyisocyanate, aliphatic, HDI, 100%, HEW = 195	80	
Sub-Total Component #2	88	
Total Paint	**1020**	
Physical Properties:		
Weight Solids, %	61	
Volume Solids, %	46	
PVC, %	17	
NCO/OH , eq. Ratio	1/1	
VOC, lbs./gal.	2.8 (if t-butyl acetate is delisted as VOC)	

Safe Handling Information

Dow Material Safety Data Sheets (MSDS) contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Under the OSHA Hazard Communication Standard, workers must have access to and understand MSDS on all hazardous substances to which they are exposed. Thus, it is important that you provide appropriate training and information to your employees and make sure they have available to them MSDS on any hazardous products in their workplace.

Dow sends MSDS for all of its products, whether or not they are considered OSHA-hazardous, to both the "bill to" and/or "ship to" locations of all its customers upon initial shipment, including samples. If you do not have access to one of these MSDS, please contact your local Dow representative for an additional copy.

Updated MSDS are sent upon revision to all customers of record. In addition, MSDS are sent annually to all customers receiving products deemed hazardous under the Superfund Amendments and Reauthorization Act.

MSDS should be obtained from your suppliers of other materials recommended in this bulletin. Additional safe handling information is available from Dow representatives.

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