

Coatings and Adhesives



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Table of Contents

REFERENCE

Adhesives and Coatings for Aluminum Foils	4
Selecting Heat-activated Adhesives.	5
Quick Reference Chart: Adhesives.	6
Quick Reference Chart: Coatings.	7

COATINGS

10-100	Heat Resistant Black Matte Coating	9
10-101	Chemical Resistant Black Matte Coating.	11
10-102	Chemical Resistant Black Semigloss Coating.	13
10-110	Desiccant Coating	15
10-413	Non-conductive/Heat Resistant Coating	17
15-130	Heat Resistant Coating, Yellow	19
15-131	Heat Resistant Coating, Black	19
15-132	Heat Resistant Coating, Red	19

PRESSURE SENSITIVE ADHESIVES

20-113	Low Shear, Bonds to Low Energy Surfaces.	21
20-527	High Shear, Quick Drying Pressure Sensitive Adhesive	23
20-649	High Tack Pressure Sensitive Adhesive.	25
20-658	High Shear, Tack; Heat Resistant Pressure Sensitive Adhesive	27

HEAT ACTIVATED ADHESIVES

30-016	Waterborne Latent Cure Heat Activated Adhesive.	29
30-100	Epoxy/Polyurethane Resin Heat Activated Adhesive.	31
30-101	Waterborne Heat Activated Adhesive.	33
30-114	Waterborne Heat Activated Adhesive.	35
30-115	Waterborne Heat Activated Adhesive.	37
40-004	Bonds Metal to PET; Primer Adhesive	39
40-063	Waterborne Heat Activated Adhesive.	41

SPECIALITY AND COATED PRODUCTS

15-112	Liquid Salicylic Acid	43
45-100	Salicylic Acid Disks.	45
45-104	Salicylic Acid Foam Pad	45
46-Series	Epoxy-Based Identification Tapes.	47
50-125	3 kGy Gamma Radiation Sensitive Labels	49
50-130	5 kGy Gamma Radiation Sensitive Labels	49
50-165	1.5 MED UV Radiation Sensitive Label.	51
50-166	3.5 MED UV Radiation Sensitive Label.	51



Adhesives and Coatings

Reference

For Aluminum Foils

Aluminum metal frequently requires a coating for decoration, protection, bonding or for functional applications. ACA produces pre-formulated water-based coatings that withstand the damages and environmental challenges aluminum often encounters in automotive, industrial, and sports applications. Our laboratory staff is also skilled in developing custom water-based aluminum coatings to your particular specifications. These coatings quite frequently can be used on other metals if the appropriate test protocols are followed to establish suitability for the application. The technical staff is forward thinking and can assist you in the selection of the best coating or adhesive for your specific application.

The available products have been successfully processed on coaters such as gravure, nip-fed reverse roll, wire wound bar and knife over roll. Modifications can be made for brush, roller or spray coating of the coatings or adhesives.

The chemicals of our special coatings or adhesives are carefully selected by the laboratory staff of ACA. Acrylate copolymers, epoxy resins, phenoxy resins, saturated polyurethanes and polyimide resins are selected or combined for most applications. Please

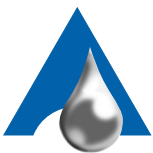
note the polyimide resins are dissolved in N-methyl pyrrolidone (NMP) rather than in water. The ultraviolet light cured systems may utilize reactive diluents or water dispersions to attain the desired qualities.

TESTING AND COATING FACILITIES

Our facility is also equipped with a high quality 12 inch wide pilot coater that can provide trial runs on your stock, for testing or for limited production of specialized products. Gravure, nip-fed reverse roll, wire wound bar, and knife over roll coating heads are available for the test runs for limited production.

A wide range of dispersion mixers and churns, from 1500 gal to drum size, are available for compounding formulae with viscosities from 100 to 2 million cps.

We can be your "one stop service" for specialized formula, test runs, limited productions, printed roll, die-cut, or sheeted goods. Merely provide us with the specifications, artwork, and packaging details.



Selecting A Heat-activated Adhesive

In order to achieve the best possible bond, several factors must be considered when selecting a heat-activated adhesive. Some experimentation will be necessary to attain the best results with your particular coaters, heat sealers and adhesives.

TOPOGRAPHY—The topography of adherends is critical. A rough surface will require more adhesive to insure good area contact to the adherends. The coating must be of sufficient thickness to fill all the valleys of the adherend and thus avoid small air bubbles or adhesive non-contact spots. Of course, an excess amount of adhesive will fill all the voids of a rough adherend, but will result in an increase of the cost of raw materials as well as coating time. Drying the adhesive to 1% or less retained water is necessary to avoid unsightly blistering of the adhesive by the retained water during the heat sealing step. More importantly, the blistering reduces the area contact and thus reduces the amount of adhesion attained.

SURFACE-FREE ENERGY—It is equally critical to consider the surface-free energy of the adherends. Polyethylene or polypropylene have low surface-free energies (30 to 33 dynes per square centimeter) and therefore it is difficult to establish good bonds using these materials. PVC, ABS and nylon are examples of plastics that have relatively high surface-free energy (44 to 50 dyne per centimeter) and are easier to bond. Clean metal will normally be approximately 70 dynes per square centimeter. An oily surface will form a weak boundary layer that can reduce peel adhesion.

TEMPERATURE, PRESSURE AND TIME—Optimal heat-sealed bonds between metal and rubbers (or plastics) depend on temperature, pressure and time. The thickness of the coated metal is a factor directly related to the transfer of heat to the adhesive. Of course, if the adhesive does not receive sufficient heat to become melted, a good bond will not be obtained. Uniformity of the heat input is also critical for the same reason. As mentioned above, the smoothness of the adherends will determine the amount of adhesive required. If a thicker coating is required because of topography of the adherends, then a slightly

longer time of contact may be required to completely melt the adhesive and cause flow. Too little pressure may cause the adhesive, even though molten, to not establish full area contact. If too much heat and pressure are applied, the adhesive will viscously flow out the edges of the heat seal area and form a ridge and thus cause a poor appearance and reduced adhesion in the areas of contact.

OTHER FACTORS TO CONSIDER—The hardness and melting-point of the plastics vary considerably. For example, nylon is very hard and melts at very high temperatures. Therefore topography of the nylon is very critical to establishing a good, void free bond. Polypropylene or polyethylene are softer materials and will flow somewhat upon exposure to the elevated temperature of heat sealing and consequently, topography is less critical. TPV's and EPDM are examples of adherends that are quite soft and may viscously flow considerably during heat sealing at high pressures.

Adherend surface cleanliness can be a factor regarding adhesion. For example, mold release agents, commonly having some silicone in them, may markedly reduce adhesion. Foil contamination or other weak boundary layer surface contaminants on the metals may also cause reduction of the adhesive properties. Frequently, oils may be used to lubricate the metal during the rolling process for foils. Later, these oils may exude from the foil and cause difficulty in forming a good bond.

The chemical composition of the plastic and metal are also influencing factors on bond quality. It is best to refer to the following selection tables and then read the specific adhesive technical literature in this manual to minimize the time required to choose the adhesive that will meet your specifications.

TROUBLESHOOTING—In spite of the published literature describing the abilities of the adhesive, troubleshooting poor adhesion depends somewhat on experience. Zippy, low peel resistance or low peel resistance under cold conditions are usually indicative that insufficient adhesive or insufficient heat



was applied to the adhesive at the time of bonding. Adhesive edge seepage is indicative of excessive heat or excessive pressure or both. Use this brochure as a guide for adhesive selection and expect to get peel adhesion values approximating those described. Our experience has been that heat sealing conditions are critical to obtaining an optimum bond and that some experimentation, based upon your exact bond design, may be required. If there are questions, call the laboratory at (330) 724-4716 to discuss your specific application and to ask for further guidance.

CHOOSING AN ADHESIVE—The table below outlines which ACA products are best suited for a variety of rubbers, plastics and metals. This guide should be helpful in selecting and testing of adhesives prior to their use in production. The technical data sheets on the following pages will provide specific data describing the peel adhesion values obtained on a given metal and plastic with a given adhesive.

QUICK REFERENCE CHART

COATINGS				
Formula Number	Description	Substrate 1		Page
ACA 10-100	Heat resistant matte black coating primarily for aluminum. Used for stage lights.	Aluminum		9
ACA 10-101	chemical resistant matte black	Metals		11
ACA 10-102	chemical resistant black	Metals		13
ACA 10-110	Base level desiccant formula	Aluminum		15
ACA 10-111	Mid level desiccant formula	Aluminum		*
ACA 10-112	High performance 4a molecular sieve hybrid desiccant	Aluminum		*
ACA 10-413	Non-conductive abrasion resistant coating	Stainless and other metals		17
ACA 10-414	More flexible version of ACA 10-413	Stainless and other metals		*
ACA 15-130	yellow, polyimide, nmp solvent, high temperature resistant	Metals		19
ACA 15-131	black, polyimide, nmp solvent, high temperature resistant	Metals		19
ACA 15-132	red, polyimide, nmp solvent, high temperature resistant	Metals		19
ACA 15-413	Solvent based version of ACA 10-414	Stainless and other metals		*
ACA 15-478	UV/solvent inkjet receptive coating, screen printable	Films		*



PRESSURE SENSITIVE ADHESIVES

Formula Number	Description	Substrate 1	Substrate 2	Page
ACA 20-100	Insect repellent adhesive, vitamin B6	Paper and Film	Various, skin contact	*
ACA 20-113	Difficult surfaces permanent label adhesive	Paper and Film	Various, skin contact	*
ACA 20-136	Skin contact, bandages	Paper and Film	Various, skin contact	*
ACA 20-527	Asphalt to metal bonding PSA hybrid	Metals	Asphalt sound deadener	23
ACA 20-649	Foot pad adhesive, skin contact adhesive	Paper and Film	Various, skin contact	25
ACA 20-658	CBSR, Crosslinked, heat, shear, aging, and chemical resistant	Metals	Various	

HEAT ACTIVATED ADHESIVES

Formula Number	Description	Substrate 1	Substrate 2	Page
ACA 30-016	Latent cure heat-activated, TPE and PP	Metals	TPO, TPV, PP	29
ACA 30-100	Heat activated adhesive, bonds santoprene and PP to metals, may block.	Metals	TPO, TPV, PP	31
ACA 30-101	Heat activated TPE and PP harder grades	Metals and Plastics	TPO, TPV, PP	33
ACA 30-102	Heat activated TPE and PP softer grades	Metals and Plastics	TPO, TPV, PP	*
ACA 30-103	Heat activated TPE and PP mid grades	Metals and Plastics	TPO, TPV, PP	*
ACA 30-104	TPE to polycarbonate	Polycarbonate	TPO, TPV, PP	*
ACA 30-114	Metal to many plastics including TPE	Metals	TPO, TPV, PP	35
ACA 30-115	Metal to many plastics including TPE	Metals	TPO, TPV, PP	37
ACA 40-004	PET to PET or PET primer for other adhesives	PET	PET	39
ACA 40-063	Aluminum to aluminum	Aluminum	Aluminum	41
ACA 40-110	PP film to insulation foam	PP Film	EPS and XPS foams	*
ACA 40-300	CAB Adhesive	Metals	CAB	*

* For more information, contact Akron Coating and Adhesives



ACA 10-100

Heat Resistant Matte Black Coating for Metals

Coating

PRODUCT DESCRIPTION—ACA 10-100 is a water based matte black coating which exhibits heat resistance to over 500°F without blistering, loss of adhesion, smoking upon heating or flexibility. The black coating is intended for application to 1 or 2 mil soft aluminum foil where intense infrared heat from Kliege lights or space heaters is encountered. Further, the coating is a potential candidate for other high temperature applications. It is advisable to test for suitability for the specific application. A curing agent must be stirred into the coating immediately prior to coating. The pot life is about 3 days. Viscosity reduction may be accomplished by the careful addition of water.

TYPICAL USE— Kliege lights, space heaters and other applications that require heat resistant coatings.

COATING METHOD—The ACA 10-100 may best be applied by rotogravure at a thickness of 0.1 to 0.2 mils. Curing is normally performed at about 400°F and 300 FPM in a 25 ft. oven. Operating conditions will vary with different ovens and coating weights and require some experimentation.

CLEAN UP—Hose down the machine and direct the excessive water to a drain. Warm soap and water may be used for the hard to clean areas of the coater. Dry, uncured coating can be removed with toluene. Toluene is an inflammable, volatile solvent and should be used in conformance with OSHA guidelines. The cured coating is very insoluble and difficult to clean from the equipment.

WET PHYSICAL PROPERTIES

<u>Test</u>	<u>Value</u>
pH.....	6.5-7.5
Viscosity (cps).....	3,000-6,000
wt./gal. (lbs.).....	9.097
Percent solids by weight.....	33.55
Percent solids by volume.....	29.43±1
Percent VOC by weight.....	3.98±1

DRY COATED PROPERTIES

<u>Test</u>	<u>Value</u>
Color.....	matte black
Thickness.....	0.15–0.30 mils
Dry rub.....	pass
MEK rub.....	5 times pass
Crease flex.....	no cracks
Heat resistance, 500° F.....	excellent
Light absorbent.....	99.8%





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ACA 10-101

Chemical Resistant Black Matte Coating

Coating

PRODUCT DESCRIPTION—ACA 10-101 is a water-borne, matte black, chemically resistant coating designed especially for resistance to exterior exposures encountered in automotive applications. A cross-linking agent must be added prior to this coating in order to achieve the desired chemical resistance. The pot life after cross-linker addition is three days. The base polymer for this application is an acrylate block copolymer. Cross-linking is via pendant carboxyl groups, which also enhance the metal adhesion.

TYPICAL USE—Automotive applications or other application requiring high resistance to various fluids and solvents.

COATING METHOD—The coating may be applied by gravure, wire wound bar or nip fed reverse roll coater. Small parts or unique shapes may be sprayed, rolled, or brush coated. Additional water may be added to enhance process ability. It is essential that total coverage of the aluminum be attained to provide good chemical protection of the metal.

CLEAN UP—Washing with water will easily clean the wet coating. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET PHYSICAL PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	8 - 9	Percent VOC by volume	9.3
Viscosity (cps)	550	Percent water by weight	59
wt./gal. (lbs.) . . . . .	.8.8	Percent water by volume	62
Percent solids by weight	33	Percent of VOC per gallon . . . . .	.0.74
Percent solids by volume	28	Pounds of VOC per gallon less water	1.96
Percent VOC by weight . . . . .	.8.4	Color	Matte Black

DRY PHYSICAL PROPERTIES—IMMERSION, 72° F

<u>Fluid</u>	<u>24 Hrs.</u>	<u>168 Hrs.</u>	<u>Fluid</u>	<u>24 Hrs.</u>	<u>168 Hrs.</u>
5% NaCl in water	Pass	Pass	Motor oil 20w 50	Pass	Pass
50% ethylene glycol in water	Pass	Fail	Motor oil 10w 40	Pass	Pass
Dawn detergent	Pass	Pass	Windshield washer fluid	Pass	Pass
Van Sol detergent, 100%	Pass	Pass	Power steering fluid	Pass	Pass
Van Sol detergent/water 1/64	Pass	Pass	Auto transmission fluid	Pass	Pass
			Brake fluid	Pass	Pass





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ACA 10-102

Chemical Resistant Black Semi-Gloss Coating

Coating

PRODUCT DESCRIPTION—ACA 10-102 is a waterborne, semi-gloss, black, chemically-resistant coating. A cross-linking agent must be added prior to this coating in order to achieve the desired chemical resistance. The pot life after cross-linker addition is three days. The base polymer for this application is an acrylate block copolymer. Cross-linking is via pendant carboxyl groups, which also enhances the metal adhesion.

TYPICAL USE—ACA 10-102 is designed especially for resistance to exterior exposures encountered typically in automotive applications.

COATING METHOD—The coating may be applied by gravure, wire wound bar or nip fed reverse roll coater. Small parts or unique shapes may be spray, rolled, or brush coated. Additional water may be added to enhance process ability. It is essential that total coverage of the aluminum be attained to provide good chemical protection of the metal.

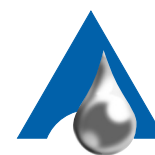
CLEAN UP—Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET PHYSICAL PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	8 - 9	Percent VOC by volume . . . . .	.7.09
Viscosity (cps)	650	Percent water by weight . . . . .	.65.49
wt./gal. (lbs.) . . . . .	.8.33	Percent water by volume . . . . .	.65.43
Percent solids by weight . . . . .	.28.13	Percent of VOC per gallon . . . . .	.0.53
Percent solids by volume . . . . .	.27.48	Pounds of VOC per gallon less water . . . . .	.1.54
Percent VOC by weight . . . . .	.6.38		

DRY PHYSICAL PROPERTIES—IMMERSION, 72° F

<u>Fluid</u>	<u>24 Hrs.</u>	<u>168 Hrs.</u>	<u>Fluid</u>	<u>24 Hrs.</u>	<u>168 Hrs.</u>
5% NaCl in water	Pass	Pass	Motor oil 20w 50	Pass	Pass
50% ethylene glycol in water	Pass	Fail	Motor oil 10w 40	Pass	Pass
Dawn detergent	Pass	Pass	Windshield washer fluid	Pass	Pass
Van Sol detergent, 100%	Pass	Pass	Power steering fluid	Pass	Pass
Van Sol detergent/water 1/64	Pass	Pass	Auto transmission fluid	Pass	Pass
			Brake fluid	Pass	Pass





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ACA 10-110

Desiccant Coating for Metals

Coating

PRODUCT DESCRIPTION—ACA 10-110 coating is a hygroscopic material that may be applied to aluminum foil. The coating may also absorb and transfer other small molecules similar to water such as aldehydes, alcohols, ketones or amines away from the working atmosphere. ACA 10-110 primarily uses water dispersions with a small amount of isopropyl alcohol in the mix to serve as a coalescing agent. The isopropyl alcohol (boiling point 82°C) evaporates in the oven with the water and is not present in the dry, coated film.

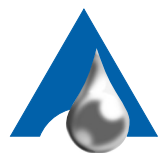
TYPICAL USE— HVAC Systems, air purification devices

COATING METHOD—Rotogravure

CLEAN UP—Washing with water will easily clean the wet coating. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
Viscosity (cps)	160-360	Percent water by weight . . . . .	.67.11
wt./gal. (lbs.) . . . . .	.8.7	Percent water by volume . . . . .	.70.11
Percent solids by weight	21.5-25.5	Percent of VOC per gallon	1.02
Percent solids by volume	14-15	Pounds of VOC per gallon less water	3.405
Percent VOC by weight	11.69	Application (mils dry)	~0.8
Percent VOC by volume	15.46		





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ACA 10-413

Heat Resistance and Electrically Resistant Coating

Coating

PRODUCT DESCRIPTION —ACA 10-413 is a water-borne heat resistance electrically resistive coating designed for application to stainless steel and other metals. ACA 10-413 should be evaluated where electrical insulation is required on metal foil and where considerable heat resistance is also required. Apply 0.3 to 0.5 mils of coating onto the metal foil in order to enjoy a pinhole free coating. If pinholes do appear, it may be necessary to apply a second thin coating to fill the pinholes.

COATING METHOD—The water-borne coating may be applied best by gravure coating. Spray coating may be used for some special small applications but care must be taken to avoid the electrical pinholes.

Drying is best in forced air oven with a temperature of about 350° F. This will yield a dry, colorless, tack-free coating. No primer is required on the metal to achieve good adhesion in most applications. Of course if the metal is soiled or oily then cleaning or priming may be necessary to avoid pinholes.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. Dry coating removal will require a toluene solvent wash for best results. Toluene is an inflammable volatile solvent and should be used in conformance of OSHA guidelines. Water may be used to dilute the coating if necessary or for processability enhancement.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	7.0 – 7.5	Percent VOC by volume	12.89
Viscosity (cps)	880	Percent water by weight . . . . .	.53.46
wt./gal. (lbs.)	8.85	Percent water by volume . . . . .	.67.07
Percent solids by weight . . . . .	.35.96	Percent of VOC per gallon . . . . .	.0.94
Percent solids by volume30.36	Pounds of VOC per gallon less water2.16
Percent VOC by weight10.58		





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ACA 15-130; 15-131; 15-132

Non-Conductive/Heat Resistant Metal Coating

Coating

PRODUCT DESCRIPTION—ACA-15-130, ACA-15-131, and ACA-15-132 are polyimide resin coatings. The solvent for this application is N-Methyl Pyrrolidone (NMP). The coating yields a heat resistant, glossy finish in red, yellow, or black colors. It may be applied to aluminum, brass, iron, or a number of other alloys. No metal pre-cleaning is normally required for foil roll stock. A metal pre-cleaning step is necessary only when excessive oil contamination is evident on the metal surface. The coatings contain no heavy metals. The coated metal may be stamped or die cut without edge cracking of the coating.

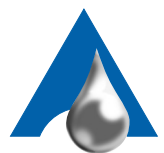
TYPICAL USE— designed to resist solder dip temperatures that may be encountered in many metal parts assembly processes.

COATING METHOD—Reverse roll coating produces the preferred application method and yields a smooth surface. However, wire wound bar, spray, or brush may be used. Care must be exercised regarding airborne NMP, and good manufacturing practices are required. Please refer to the MSDS.

CLEAN UP—Wash the equipment with N-Methyl Pyrrolidone (NMP) to remove the wet adhesive. Dry adhesive may require a toluene wash. These solvents should be used in conformance with OSHA guidelines.

PHYSICAL PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
Viscosity (cps)	3500	Heat Resistance (°F)	up to 500
Percent solids by weight	20	Shelf life (months)	6
15-130 color	Yellow	Packaging	5 gallon pails
15-131 color	Black	Packaging	450 lb. non-returnable fiber drums
15-132 color	Red		
Thickness (inches)001		





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ACA 20-113

Bonds to Low-Energy Surfaces

Adhesive

PSA

PRODUCT DESCRIPTION— ACA 20-113 is a water based pressure sensitive adhesive. It provides excellent adhesion to low-energy surfaces and has excellent moisture resistance.

TYPICAL USE— Anywhere a low shear adhesive with strong bonds to low energy surfaces is indicated.

COATING METHOD— Dalhgren, Meyer rod, knife over roll

CLEAN UP—Washing with soap and water will clean the wet coating. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	7.4	Percent water by weight	46±2
Viscosity ^A (cps)	1,500-2,400	Percent water by volume.	47±2
wt./gal. (lbs.)	8.6	Percent of VOC per gallon	<0.001
Percent solids by weight	53±2	Pounds of VOC per gallon less water	<0.001
Percent solids by volume.	52±2	Mechanical Stability	Excellent
Percent VOC by weight	<0.005	Polymer Type.	Acrylic Emulsion
Percent VOC by volume.	<0.005		

DRY COATED PROPERTIES (1 MIL FILM, 2 MIL MYLAR)

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
Polyester backing/Stainless Steel ^B		Polyken tack (gm/cm ²): Initial	936
180° peel adhesion (lb/in.): Initial.	5.1 ^C	Shear resistance, 90° F (hours): Initial.	0.60 ^C

A. Brookfield Viscometer Model LVF

B. Test using 25 g/m² (1.0 mil) dry adhesive on 2 mil polyester

C. PSTC-1 30 min. dwell. Cohesive failure for peel and shear values.





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ACA 20-527

Heat Resistant, Rapid Drying Adhesive

Adhesive

PSA

PRODUCT DESCRIPTION—ACA 20-527 is a waterborne pressure sensitive adhesive. This pressure sensitive adhesive is very high in solids to facilitate rapid drying during the application process. The dry adhesive exhibits high shear resistance, resistance to high temperatures and sufficient tack to facilitate rapid assembly.

TYPICAL USE—ACA 20-527 bonds asphalt sound dampening parts to steel. ACA 20-527 will ensure that the die cut asphalt parts will remain well bonded and in registry on steel stamped parts even though the parts may be exposed to high temperatures or low temperatures during transportation and assembly. The pH of the adhesive has been adjusted so as to avoid flash rusting of the metal substrate. Heat age testing indicates that the asphalt does not migrate into the adhesive, a common cause of adhesive failure.

COATING METHOD—Application of the adhesive may be by brush or roller and on the specific areas required followed by drying with forced air at elevated temperatures.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. Dry adhesive may require a toluene wash. Toluene is an inflammable, volatile solvent and should be used in conformance with OSHA guidelines.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	5.0 ± 0.5	Percent VOC by volume	1.2
Viscosity (cps)	5500-6500	Percent water by weight	40.06
wt./gal. (lbs.)	8.6	Percent water by volume	41.22
Percent solids by weight	58.9	Percent of VOC per gallon	0.089
Percent solids by volume	57.6	Pounds of VOC per gallon less water	0.152
Percent VOC by weight	1.04		

DRY COATED PROPERTIES (1 MIL FILM, 2 MIL MYLAR)

<u>Test</u>	<u>Value</u>
Peel (189° 20 minute dwell) (pli)	1.25
Shear Resistance (hours)	300+
Tack (Polyken)	260 - 300





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ACA 20-649

Latex-free Adhesive for Skin Adhesion

Adhesive

PSA

PRODUCT DESCRIPTION—ACA 20-649 is a pressure sensitive adhesive composed primarily of synthetic polymers and avoids natural rubber latex. The polymer is crosslinked to enhance chemical and heat resistance. Heat and perspiration do not affect its high tack and shear resistance. A 1 mil dry adhesive film is recommended as a starting point for testing. Rough topography such as fabrics may require greater adhesive thickness.

TYPICAL USE— Designed for skin adhesion applications such as the padding used in shoes as well as other skin padding and plasters. It may be used on a wide variety of plastic films and foams. However, PVC containing migratory or monomeric plasticizers will degrade the adhesion properties with time and are not recommended.

COATING METHOD— wirewound bar, knife, gravure

CLEAN UP—Washing with water will clean the wet coating. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	5.0 ± 0.75	Percent VOC by volume	0.002
Viscosity (cps)	2500 ± 500	Percent water by weight	37.542
wt./gal. (lbs.)	8.6	Percent water by volume	38.618
Percent solids by weight	62.5	Percent of VOC per gallon	0.00013
Percent solids by volume	61.4	Pounds of VOC per gallon less water	0.00021
Percent VOC by weight	0.001		

DRY ADHESIVE PROPERTIES (1 MIL FILM, 2 MIL MYLAR)

<u>Test</u>	<u>Value</u>
Peel (189° 20 minute dwell) (pli)	7.5
Shear Resistance (hours)	20
Tack (Polyken)	1500





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ACA 20-658

Heat Resistant, Rubber-Resin Type Adhesive

Adhesive

PSA

PRODUCT DESCRIPTION—ACA 20-658 is a high peel adhesion, high shear resistance and high tack heat stabilized and heat resistant rubber-resin type pressure sensitive adhesive. Its cross-linking capability can be used to further enhance heat resistance. All components of ACA 20-658 conform to the requirements of 21CFR 175.105 FDA.

TYPICAL USE—ACA 20-658 is designed as a mounting adhesive for the defrosters in automatic defrosting refrigerators.

COATING METHOD—Adhesive application normally is by the transfer method using a nip fed reverse roll coater or a wire wound bar coater. Lower coating weights may be applied by gravure coaters. Normal industrial applications usually require a dry film thickness of about 1.5 mils. Performance of the adhesive is dependent on substrate topography.

CLEAN UP—Wash the equipment with water to remove the wet adhesive. Dry adhesive may be cleaned using toluene or other cleaning solvents. Toluene is an inflammable, volatile solvent and should be used in conformance with OSHA guidelines. A thin film of vasoline applied to frequently exposed parts of the coater will facilitate clean up.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>
pH	8
Viscosity (cps)	3000
wt./gal. (lbs.)	8.7
Percent solids by weight	54

DRY ADHESIVE PROPERTIES (1 MIL FILM, 2 MIL MYLAR)

<u>Test</u>	<u>Value</u>
Peel (ASTM D-903) (pli)	7.5
Shear Resistance (90°F, 2lbs/in ²) (hours)	200+
Tack (ASTM D-2979) (g)	1200





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ACA 30-016

Bonds Metals to Polar and Non-Polar Plastics

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 30-016 is a heat activated latent cure waterborne adhesive. The adhesive will work with plastic over-molding or extrusion onto the metal. Pre-heating metal components to 200°F may be necessary in injection molding applications. The adhesive is unique in that it has a latent cure mechanism that cures the adhesive during heat activation providing salt-water and solvent resistance.

TYPICAL USE—ACA 30-016 is designed, to bond and non-polar and polar surfaces such as polypropylene to aluminum and other metals. It will also bond metals to a variety of plastics and TPE/TPV, including Santoprene. Since there are so many choices of metals and plastics in this class, testing is necessary to establish that a good bond is provided with a given application.

COATING METHOD—The adhesive may be applied to metal foil by gravure printing, nip-fed reverse roll or wire wound bar coating methods. Brush, spray, or a paint roller may be used for unique shapes. The adhesive may be dried in a forced air oven at about 225° F. for a few seconds to yield an adhesive dry thickness between 0.3 and 0.75 mils. About 0.5 mils is a good place to start for adhesion evaluation. It may be necessary to run chill rolls on the oven output to avoid roll blocking and/or interleave a release liner.

Adhesive activation is accomplished at 400° F., 5 PSI, for 60 seconds. Conditions may differ depending upon the heat sealer and specific adherents.

ACA 30-016 is a dispersion and should be properly mixed prior to usage.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

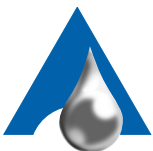
<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	7 - 8	Percent water by weight	53±2
Viscosity (cps)	100-300	Percent water by volume	57±2
wt./gal. (lbs.)	8.87	Percent of VOC per gallon	0.03±0.01
Percent solids by weight	44-48	Pounds of VOC per gallon less water	0.08±0.01
Percent solids by volume	40-44	Color	Milky White Liquid
Percent VOC by weight	0.40±0.1		
Percent VOC by volume	0.45±0.1		

DRY ADHESIVE PEEL VALUES (0.5 MIL COATING ON 8 MIL ALUMINUM)

<u>Substrates</u>	<u>AVG</u>	<u>PEAK</u>	<u>Substrates</u>	<u>AVG</u>	<u>PEAK</u>
Santoprene 121-67 (pli)	22	27	GM Test Bar (pli)	20	24
Cast Vinyl (pli)	36	41	Polypropylene (pli)	24	30

All samples coated at 0.5 mils dry (0.0005") onto 0.008" aluminum then oven dried at 200°F. Samples heat sealed at 400°F for 60 seconds at 5 PSI.





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ACA 30-100

Bonds Metal To Elastoplastic Rubbers

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 30-100 is a waterborne blend of epoxy and polyurethane resins containing adhesion promoters. The system contains no crosslinkers when shipped. However, a crosslinker may be added to further enhance hot strength and solvent resistance, but the product will then have a 3 day pot life. Contact ACA regarding use of the crosslinker.

TYPICAL USE— ACA 30-100 is designed to bond metal to elastoplastic rubber such as Santoprene that contain olefin structures, oils extenders and fillers. The bond is good over a range of different Santoprene formulations and should be good for similar competitive rubbers.

COATING METHOD—This waterborne adhesive may be applied to metal foil by gravure, wire wound bar, or nip fed reverse roll coater. Spray or brush may also be used for small applications. Drying at a temperature of 350°F for a short period yields a heat sealable coating. It can be activated at 250°F to 300°F with contact pressure to yield a substrate tearing bond. No primer coating or substrate cleaning is required for most applications. Peel adhesion is non-zippy from -20°F and up.

To mold bond the elastoplastic rubber to metal pre-coat the metal part with ACA 30-100. Dry the water from the adhesive, and inject the molten polymer into the mold containing the adhesive coated metal part. A very strong bond will result using this technique. Drying the adhesive to remove all volatile adhesive components is essential to avoid out-gassing at the bond line.

ACA 30-100 may be applied by gravure, Meyer bar, spray or brush. The water in the system must be evaporated prior to activation. This may be accomplished by use of a forced air oven set at 200° F for 10 minutes. The optimum dry film thickness must be determined by experimentation. A dry film thickness of 0.001" is a good starting point. It is only necessary to attain an interface temperature of about 250° F for bonding. Applications include combining coated aluminum to cold Santoprene in a hot mold, or combining hot extruded, or injection molded Santoprene onto a cold coated substrate. Some cool-down contact pressure may be required on the non-thermoset adhesive. A good bond is indicated by a peeled sample having a metallic black color, which indicates the tearing of the Santoprene.

ACA 30-100 may be diluted with water as required by the application method. Stir before using.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards. Totally cured adhesive is difficult to clean and should be avoided if possible.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	8 - 9	Percent water by weight . . . . .	.56.52
Viscosity (cps)	13000	Percent water by volume . . . . .	.59.45
wt./gal. (lbs.) . . . . .	.8.77	Percent of VOC per gallon . . . . .	.0.26
Percent solids by weight . . . . .	.40.49	Pounds of VOC per gallon less water . . . . .	.0.65
Percent solids by volume . . . . .	.36.94		
Percent VOC by weight . . . . .	.56.52		
Percent VOC by volume . . . . .	.3.61		



HEAT ACTIVATED

PEEL ADHESION OF ACA 30-100

Metal	Plastic	Adhesive Thickness (mils)	Average Peel (pli)	Peak Peel (pli)
8 mil Aluminum. . .	GM Test Bar	0.2	23	23
8 mil Aluminum . . .	Santoprene 103-50	0.2	25	27
8 mil Aluminum. . .	Santoprene103-73	0.3	23	26
8 mil Aluminum. . .	Santoprene 103-80	0.3	17	21
8 mil Aluminum . . .	Santoprene 103-80	0.5	25	27
8 mil Aluminum. . .	Santoprene 103-87	0.3	12	14
8 mil Aluminum . . .	Santoprene 103-87	0.5	19	22
8 mil Aluminum. . .	Santoprene 103-40	0.3	13	16
8 mil Aluminum . . .	ABS	0.3	14	17
8 mil Aluminum. . .	Neoprene	0.50	31	49
8 mil Aluminum. . .	EPDM	0.50	21	35
8 mil Aluminum. . .	NR Foam	0.50	Foam tear	
8 mil Aluminum . . .	EPDM Foam	0.50	Foam tear	

Peel Adhesion: 180° angle, 5 in/min., 72° F

Heat Seal: 400° F, pressure and time variable

IMMERSION RESISTANCE

The adhesive bond is resistant to immersion in water solutions of calcium chloride, sodium chloride detergent (Tide), ethylene glycol and windshield fluids. It is also resistant to hydraulic fluids, motor oil (SAE 10-40) and grease. However, some crosslinking can enhance fluid and heat resistance if needed. Peeling at -20° F yields a smooth, non-zippy bond.



ACA 30-101; 30-102; 30-103

Bonds Metal to Polar and Non-Polar Plastics

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—The ACA 30-101, ACA 30-102, and ACA 30-103 series are waterborne dispersions of heat activated adhesives formulated to be used with a variety of grades of TPO/TPE materials. ACA 30-101 is for the softer grades of TPO/TPE, and has the lowest melting point. ACA 30-102 is for the midrange materials, and ACA 30-103 is for the hardest TPO/TPE, and has the highest melting point.

TYPICAL USE— This series of adhesives is designed to bond non-polar and polar surfaces such as polypropylene to aluminum and other metals using injection or over-molding processes. They will also bond metals to a variety of plastics and TPE/TPO/TPV, including Santoprene0. Since there are so many choices of metals and plastics in this class, testing is necessary to establish that a good bond is provided with a given application.

COATING METHOD—An adhesive dry film thickness of 0.3-1.0 mils should be applied to the metal surface and then dried to evaporate the water. The adhesive may be applied to metal foil by gravure printing, nip-fed reverse roll or wire wound bar coating methods; however, care must be taken to prevent blocking as these adhesives may be slightly tacky. It may be necessary to interweave a release film or to run chill rolls on the oven output to avoid roll blocking. Brush, spray, or a paint roller may be used for unique shapes. Dry the adhesive in a forced air oven up to 300°F for a brief time to yield an adhesive dry thickness between 0.3 and 1.0 mils.

TEST SAMPLE PREPARATION—Adhesive activation was accomplished at 250°F, 40 PSI, for 10 seconds using a laboratory heat sealer. Your conditions may differ depending upon the heat sealer and specific adherents. These adhesives were also evaluated using a Boy 15S injection molder with molds set up to make 1"x5"x0.125" peel test samples. The back mold in which the metal was inserted was heated to 200°F and the front mold where the polymers were injected was chilled with constant loss cold tap water. Metal parts should be preheated prior to molding to 180-200°F. Dry adhesive properties and custom testing are available upon request.

CLEAN UP—Wash the equipment with water to remove the wet adhesive. Dry coating removal will require a toluene solvent wash for best results. Toluene is an inflammable volatile solvent and should be used in conformance of OSHA guidelines.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH.....	8 - 9	Percent solids by weight.....	41-45
Viscosity (cps).....	100-200	Density (lbs/gallon).....	8.8-8.9
wt./gal. (lbs.).....	8.8-8.9	Color.....	Milky White Liquid





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ACA 30-114

Bonds Metal to Non-Polar Plastics

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 30-114 is a heat activated water-borne adhesive. ACA 30-114 is based upon a saturated polyurethane with an epoxy resin derivative and an adhesion promoter designed for non-polar adherents.

TYPICAL USE— ACA 30-114 is designed to bond to non-polar surfaces such as carbon black filled polypropylene. It may also bond other metals to similar plastics. The adhesive is designed to bond well to metallic surfaces, so it will also adhere to many polar plastic surfaces such as nylon or ABS plastics.

COATING METHOD—The adhesive is relatively high in viscosity and may not process well on some coating machinery. Generally, it will process well on nip-fed reverse roll or wire wound bar coating machinery. The viscosity may be slightly high for gravure coating. Brushing or application with a paint roller may be used for unique shapes. If necessary, the adhesive may be diluted with water for some applications. The additional water may present some wetting out problems or surface tension breaks. An adhesive film thickness of 0.5 mils is applied to a metal surface and dried in a forced air oven at about 300°F for a few seconds to evaporate the water, then heat sealed at 300°F. It may be necessary to run chill rolls on the oven output side to avoid roll blocking.

Adhesive activation typically occurs at 400°F, 100 PSI, for 10 seconds. Heat sealing conditions may vary depending upon the heat sealer and specific adherence.

CLEAN UP—Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	8 - 9	Percent VOC by volume . . . . .	.1.84
Viscosity (cps)	6000	Percent water by weight . . . . .	.64.17
wt./gal. (lbs.) . . . . .	.8.7	Percent water by volume . . . . .	.67.07
Percent solids by weight . . . . .	.34.30	Percent of VOC per gallon . . . . .	.0.13
Percent solids by volume . . . . .	.31.09	Pounds of VOC per gallon less water . . . . .	.0.40
Percent VOC by weight . . . . .	.1.53		



HEAT ACTIVATED

PEEL ADHESION OF ACA 30-114

Metal	Plastic	Adhesive Thickness (mils)	Average Peel (pli)	Peak Peel (pli)
8 mil Aluminum. . . .	Black PP	0.3	24	27
8 mil Aluminum. . . .	Black PP	0.5	25	29
8 mil Aluminum. . . .	Natural PP	0.5	28	33
8 mil Aluminum. . . .	Santoprene 101-87	0.5	24	29
8 mil Aluminum. . . .	Santoprene 101-70	0.5	14	20 ^A
8 mil Aluminum. . . .	Santoprene 101-50	0.3	27	0.4
8 mil Aluminum. . . .	Santoprene 101-80	0.3	23	26
8 mil Aluminum. . . .	Santoprene 101-55	0.5	11	14 ^A
8 mil Aluminum. . . .	Santoprene 101-60	0.5	15	21 ^A
8 mil Aluminum. . . .	Santoprene 103-40	0.3	20	25
8 mil Aluminum. . . .	Santoprene 101-55	0.5	11	13
8 mil Aluminum. . . .	Santoprene 101-40	0.3	17	22
8 mil Aluminum. . . .	Santoprene 8201-70	0.2	10	19
8 mil Aluminum. . . .	Santoprene 8201-80	0.2	15	18
8 mil Aluminum. . . .	Nylon 6	0.5	28 ^B	34 ^B
8 mil Aluminum. . . .	Nylon 6	0.3	No bond, rough surface	
8 mil Aluminum. . . .	ABS	0.5	24	32
8 mil Aluminum. . . .	GM test bars	0.5	22	24
8 mil Aluminum. . . .	TPV	0.5	13	16 ^A
6 mil Stainless Steel	TPV	0.2	8 ^C	8 ^C
8 mil Aluminum. . . .	GE ABS-848	0.3	21	25
3 mil Aluminum. . . .	GE ABS-848	0.3	All broke upon peeling	
8 mil Aluminum. . . .	TPO	0.2	24	26
8 mil Aluminum. . . .	PVC	0.5	24	33

Peel Adhesion: 180° angle, 5 in/min., 72° F

Heat Seal: 400° F, pressure and time variable

A. Adherend tear

B. Adhesive transfer from Aluminum to nylon 6

C. The stainless steel is very stiff and markedly changes the angle of peel.



ACA 30-115

Bonds Metal to Non-Polar Plastics

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 30-115 is a heat activated, water-borne adhesive. ACA 30-115 is based upon a saturated polyurethane with a modified epoxy resin and an adhesion promoter designed for non-polar adherents.

TYPICAL USE— ACA 30-115 is designed to bond aluminum to non-polar and polar surfaces such as carbon black filled polypropylene. It may also bond other metals to similar plastics.

COATING METHOD—The adhesive may be applied to the metal foil by gravure printing, nip-fed reverse roll or wire wound bar coating methods. Brush, spray, or a paint roller may be used for unique shapes. If necessary the adhesive may be diluted with water. The adhesive may be air dried or dried in a forced air oven at about 300°F for a few seconds. It may be necessary to run chill rolls on the oven output to avoid roll blocking.

Adhesive activation typically occurs at 400°F, 100 Psi, for 10 seconds. Conditions may be different depending upon the heat sealer and specific adherents.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	8 - 9	Percent VOC by volume . . . . .	.1.62
Viscosity (cps)	1050	Percent water by weight . . . . .	.66.23
wt./gal. (lbs.) . . . . .	.8.62	Percent water by volume . . . . .	.68.48
Percent solids by weight . . . . .	.32.40	Percent of VOC per gallon . . . . .	.0.12
Percent solids by volume . . . . .	.29.90	Pounds of VOC per gallon less water . . . . .	.0.37
Percent VOC by weight . . . . .	.1.37		



HEAT ACTIVATED

PEEL ADHESION OF ACA 30-115

Metal	Plastic	Adhesive Thickness (mils)	Average Peel (pli)	Peak Peel (pli)
8 mil Aluminum. . .	.GM test	0.3	23	25
8 mil Aluminum. . .	.Black PP	0.3	21	23
8 mil Aluminum. . .	.natural PP	0.3	23	25
8 mil Aluminum . . .	.ABS	0.3	23	28
8 mil Aluminum. . .	.Santoprene 103-40	0.3	15	19
8 mil Aluminum. . .	.Santoprene 103-5 D	0.3	11	25
8 mil Aluminum . . .	.Santoprene 101-53	0.3	4	5
8 mil Aluminum. . .	.Santoprene 101-65	0.3	6	8
8 mil Aluminum. . .	.Santoprene 101-73	0.3	5	7
8 mil Aluminum . . .	.Santoprene 101-80	0.3	9	11
8 mil Aluminum. . .	.Santoprene 101-87	0.3	13	16
8 mil Aluminum. . .	.TPV	0.3	7	8
8 mil Aluminum. . .	.PVC	0.5	25	37

Peel Adhesion— 180° angle, 5 ipm, 72o F

Heat Seal— 400°F, pressure and time variable



ACA 40-004

Bonds Metal to PET; Primer Adhesive

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 40-004 is a waterborne heat activated adhesive.

TYPICAL USE—ACA 40-004 is primarily designed to bond PET to PET, as well as various other plastics and metals. ACA 40-004 may also be used as a primer for ACA XX-XXX to bond PET with TPO/TPE/PP compounds.

COATING METHOD—Application of the wet adhesive can be with a roller, brush, spray or traditional coil coating methods such as gravure or knife over roll coaters. The wet adhesive can be dried with forced air or simply allowed to air dry. Heat activation should not take place until the adhesive is thoroughly dry. ACA 40-004 has an activation temperature in the range of 350-450°F. Pressure is recommended during heat activation in order to ensure 100 percent contact of the adhesive with the substrates. After achieving activation temperature at the bond interface the part may be cooled immediately by mechanical means or allowed to cool naturally.

CLEAN UP—Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH	9	Percent VOC by volume . . . . .	.4.1345
Viscosity (cps)	2700	Percent water by weight	36.4726
wt./gal. (lbs.) . . . . .	.8.7	Percent water by volume	38.7488
Percent solids by weight . . . . .	.60.1370	Percent of VOC per gallon . . . . .	.0.3003
Percent solids by volume . . . . .	.57.1167	Pounds of VOC per gallon less water . . . . .	.0.4903
Percent VOC by weight . . . . .	.3.3904	Color	Milky White Liquid

DRY ADHESIVE PEEL VALUES (8 MIL ALUMINUM FOIL, 180° PEEL FROM PET SHEET)

<u>TEST</u>	<u>AVG</u>	<u>PEAK</u>
Peel (pli)	17	20





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ACA 40-063

Bonds Aluminum Foil to Aluminum Foil

Adhesive

HEAT ACTIVATED

PRODUCT DESCRIPTION—ACA 40-063 is a waterborne, heat activated adhesive. It is an internally plasticized acrylic acid copolymer where the acid groups promote adhesion to metal oxides on the metal surface. The adhesion can be partially cross-linked through these carboxyl groups to enhance heat resistance or chemical resistance. Since the polymer is acrylic, it performs well both indoors and outdoors. The adhesive must attain a temperature of at least 275°F and be under contact pressure during both heating and cooling for the best bond.

TYPICAL USE— ACA 40-063 is designed to bond aluminum foil to aluminum foil.

COATING METHOD—The waterborne adhesive may be applied by gravure, wire wound bar, or nip fed reverse roll coater on aluminum roll stock and forced air dried for a few seconds at 300° F to 400°F. Cooling rolls are recommended before wind up. The adhesive may be brush or spray applied on unique shapes.

CLEAN UP— Wash the equipment with water to remove the wet adhesive. The dry coating may require a toluene wash. Toluene is a flammable solvent and must be used according to OSHA safety standards.

WET ADHESIVE PROPERTIES

<u>Test</u>	<u>Value</u>
Color	Milky White Liquid

DRY ADHESIVE PEEL VALUES (8 MIL ALUMINUM FOIL, 180° PEEL)

<u>Metal</u>	<u>Adhesion thickness</u>	<u>Avg. Peel</u>	<u>Peak Peel</u>
8 mil Aluminum.....	0.25 mils	15 pli	16pli
8 mil Aluminum.....	0.50 mils	16 pli	20 pli

Heat seal at 100 psi, 400 F, 10 sec.

Viscosity with Brookfield DV11+ at 72°F, Spindle 3, 20 Rpm.

Peel Adhesion at 18° angle and jaw separation rate of 5 in/min.





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ACA 15-112

Liquid Salicylic Acid Preparation

Specialty

SPECIALTY PRODUCTS

PRODUCT DESCRIPTION—A blend of alcohol, hydrocarbon solvent, collodion and salicylic acid. The appearance is slightly yellow with a strong alcohol, ether odor.

TYPICAL USE—Applied topically, the preparation will provide excellent hydrolyzation of tissue over a period of time resulting in the removal of corns and calluses. Caution should be used in the application of the product because adjacent healthy tissue could be hydrolyzed with exposure.



TYPICAL PROPERTIES

<u>Test</u>	<u>Value</u>	<u>Test</u>	<u>Value</u>
pH.....	n/a	Percent Salicylic Acid.....	17±0.25
Viscosity (cps) ¹	50 - 200	Inert Ingredients (Percent by weight)	83Percent VOC
wt./gal. (lbs.).....	.8.7	Mechanical Stability.....	excellent
Percent solids by weight.....	17±0.25	Freeze/Thaw Stability.....	stable

1. Brookfield viscometer model dvii with small sample adapter





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ACA 45-100; 45-104

Salicylic Acid Coated Disks and Pads

Specialty

SPECIALTY PRODUCTS

PRODUCT DESCRIPTION—Salicylic acid products are available as a pressure sensitive adhesive (PSA) die cut disk or foam pads of various diameters. The chemical composition is controlled by FDA monographs listed in the Federal Register of Tuesday, August 14, 1990. The products are produced according to FDA Good Manufacturing Procedures for Over the Counter Topical Drugs, and our facilities are periodically inspected for compliance. The customer is invited to select their desired size and pattern as well as provide the art work for flexographic printing. Contact ACA regarding available die sizes and sheet sizes and the desired release film.



Volara cross linked foam pads coated with a strong PSA may be placed over the salicylic acid disk for added patient comfort.

ACA-45-100 is are disks of various diameters coated with a mixture of an acrylate pressure sensitive adhesive (PSA) and salicylic acid to conform to the 40% weight on weight of salicylic acid prescribed by the FDA. The shelf life of the packaged product is 3 years. The adhesive provides good skin adhesion. The silicone coated release film may be 4 mil PET, polyethylene coated two sides, or silicone coated one side 90 pound paper. Multiple disks are die cut on each sheet which then may be packaged in heat seal packages. Custom artwork may be applied to the packaging film.

ACA-45-104 Foam Pads are coated with a PSA containing components that conform to the Code of Federal Regulations Book 21 Section 175.105. Color may be white or flesh colored. Die cut and sheeting size variation are available.

TYPICAL USE—Applied topically, the preparation will provide excellent hydrolyzation of tissue over a period of time resulting in the removal of corns and calluses. Caution should be used in the application of the product because adjacent healthy tissue could be hydrolyzed with exposure.





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ACA 46-Series

Epoxy-Based Identification Tape

Specialty

SPECIALTY PRODUCTS

PRODUCT DESCRIPTION—The ACA 46 Series Identification Tapes are epoxy based pigmented coatings designed to provide a permanent, chip resistant color band that is resistant to heat and humidity. The pigments will not leach during autoclaving and are nontoxic. Properly applied and cured, the tape will withstand hundreds of cycles of autoclaving without pitting, chipping or fading. The tape rolls are 0.25" in width by thirteen feet in length.

TYPICAL USE— ACA 46-Series Epoxy-Based Identification Tape has been successfully used to color code surgical instruments. It can withstand extremely harsh conditions, and can be used in a variety of industrial and medical applications.

APPLICATION METHOD—To apply the tape simply cut to the correct length, strip the release liner and tightly wrap the instrument. Cure the tape by baking the instrument in an oven at 250°F for 30 minutes.



PRODUCT NUMBER AND DESCRIPTION

Product Number	Color
ACA-46-016	Dark Blue
ACA-46-042	Black
ACA-46-116	Maroon
ACA-46-142	Brown
ACA-46-316	Red
ACA-46-342	Orange
ACA-46-416	Gray
ACA-46-442	Yellow
ACA-46-516	Pink
ACA-46-542	Light Green
ACA-46-642	Dark Green
ACA-46-742	Light Blue
ACA-46-842	Purple
ACA-46-942	Ivory

colors are approximate.





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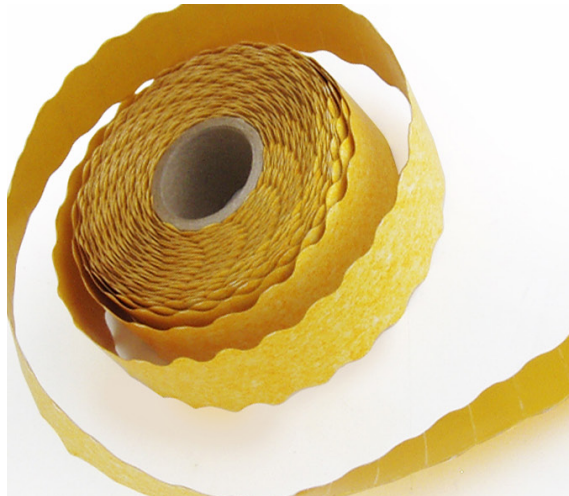
ACA 50-125; 50-130

Gamma Radiation Sensitive Labels

Specialty

SPECIALTY PRODUCTS

PRODUCT DESCRIPTION—ACA 50-125 and ACA 50-130 are radiation sterilization indicators that change from yellow to orange and green to purple on exposure to 3 kGy and 5 kGy of gamma radiation respectively. The indicator ink is applied to a specially designed pressure sensitive label stock that may be die cut, printed or slit into rolls per the customer's requirements. Application may be done by peeling individual labels from rolls or with a METO gun.



Color fast inks may be printed over the indicating ink so a message such as "EXPOSED" or "NOT EXPOSED" either appears or disappears after exposure. If the color fast ink is the same color as the start point of the radiation sensitive ink, the message will appear after irradiation. Conversely, if the color fast ink is the color of the radiation sensitive ink after exposure, the message disappears upon irradiation.

Recommended reading to more fully understand the values and limits of gamma sterilization of foods is provided in great detail by the book: *Irradiation of Food and Packaging*, ACS symposium series 875, edited by V. Komolprasert and K. Morehouse.

ACA 50-125 changes color when exposed to 3 kGy of gamma radiation.

ACA 50-130 changes color when exposed to 5 kGy of gamma radiation.

TYPICAL USE— The 3 kGy indicators are most commonly used to show gamma exposure for fish and poultry while the 5 kGy indicators are used for vegetables. Irradiation of these food products is now allowed by the FDA or USDA. The benefits of irradiation include slowing of spoilage, elimination of microbiological organisms, and bacteria, resulting in the reduction of consumer risk of illness or death.





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ACA 50-165; 50-166

UV Sensitive Labels

Specialty

SPECIALTY PRODUCTS

PRODUCT DESCRIPTION— UV Sensors are ultraviolet radiation sensitive labels that change from yellow to red when exposed to the amount of UV radiation that would cause a fair skinned person to experience sunburn. UV Sensors consist of an ink that changes color in a calibrated fashion as it absorbs ultraviolet rays. The ink is applied to a specially designed pressure sensitive roll label stock. The material can be printed, die cut, sheeted and custom packaged with graphics of your choice. For the best adhesion, the UV Sensors should be applied to clean, dry surfaces. They may be worn on clothing, clean skin, or placed on surfaces that have sunlight exposure similar to the wearer. Shelf life is over 2 years if the UV Sensors are kept in the sealed packages and kept away from extreme heat and humidity.



ACA-50-165 changes color with exposure to UV light of 1.5 MEDs.

ACA 50-166 changes color at 3.5 MEDs.

TYPICAL USE—The label warns the person wearing the UV Sensor to get out of the sun before sunburn occurs. This is especially important for young children. Studies have shown that as little as three severe bouts of sunburn can increase the risk of skin cancer later in life.





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