



Renewable resources.  
Endless possibilities.™

## Resins for printing inks



# Our green tradition drives your green future

## OUR INNOVATIVE REFINING TECHNOLOGY

With our world class manufacturing practices and the largest distillation facilities, we are able to generate the highest value from Crude Tall Oil. With increased energy efficiency and low levels of emission and waste, we have been granted various environmental certificates.

## Products for the graphic arts industry

### PHENOLIC MODIFIED ROSIN ESTERS

Phenolic Modified Rosin Esters offer a wide range of viscosity, structure and aliphatic tolerance for all lithographic ink applications including heatset and sheet fed vehicle formulations, pigment wetting (flush and grind base) and cold set applications. New high molecular weight resins based on SYLVAPRINT® HSR (Heat Stable Rheology) chemistry yield inks less sensitive to variations in press temperatures. They provide reduced dot gain, wider water windows and lower oven temperatures.

### INK POLYAMIDES

Ink polyamides are reaction products of dimerized fatty acids, diamines and chain terminators. Depending on the chemistry employed, they are useful for production of both alcohol soluble and co-solvent flexographic and packaging gravure inks. A wide range of products are available depending on the print process, color strength, gloss and film forming required. Resins with a range of FDA clearances are available.



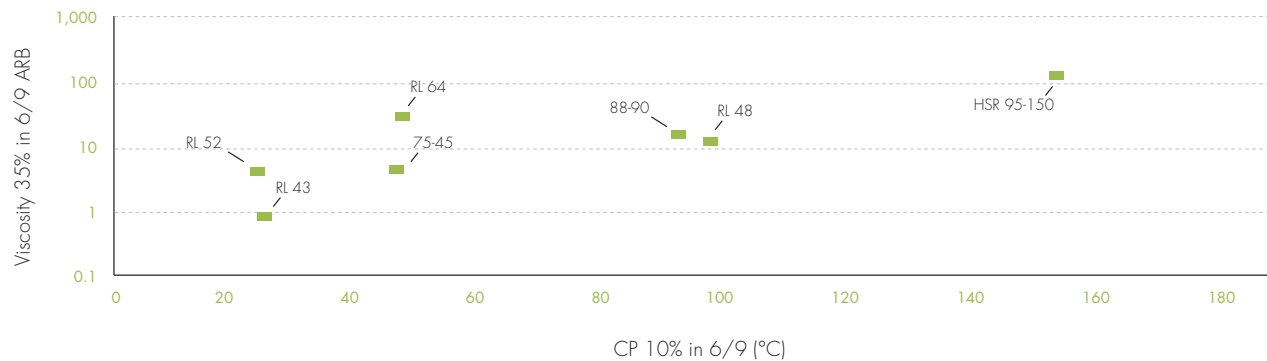
# Resins for printing inks

## ▼ LITHOGRAPHIC INK RESIN

	AQCM 072 Flow Viscosity (Pa.s)	QC Solution	ACQCM 059 Cloud Point (degree C)	QC Solution
SYLVAPRINT® RL43	15	45% in 6/9	135	10% in 6/9 AF
SYLVAPRINT® RL48*	50	40% in 6/9 AR BLEND	95	10% in 6/9
SYLVAPRINT® RL52	35	40% in 6/9	135	10% in 6/9 AF
SYLVAPRINT® RL64*	30	35% in 6/9 AR BLEND	110	10% in 6/9 AFN
SYLVAPRINT® 75-45*	55	45% in 6/9 AR BLEND	130	10% in 6/9 AFN
SYLVAPRINT® 88-90*	40	40% in 6/9 AR BLEND	90	10% in 6/9
SYLVAPRINT® HSR 95-150*	25	35% in 6/9 AR	150	10% in 6/9

SYLVAPRINT® HSR (Heat Stable Rheology) means the resin will demonstrate stable rheology over a wider range of temperatures relative to conventional rosin or hydrocarbon based resins

\* Make To Order, Full Batch Size (Approx. 23 mt)



## ▼ PUBLICATION GRAVURE INK RESIN

	AQCM 072 flow Viscosity (mPa.s)	QC Solution	AQCM 001 Acid Number
SYLVAPRINT® MP 6314	200-450	35% in Toluene	5-50

## Resins for printing inks

▼ LIQUID INK RESIN (polyamides)	AQCM 003 Softening Point °C	Solvent	Solids %	AQCM 004 Solution Viscosity. 25°C. mPa.s	AQCM 001 Acid Number mg KOH/g	AQCM 069 Amine Number mg KOH/g	Percent Biomass ASTM D6866 (percent C14)	BRC INDEX	FDA REF
UNI-REZ® 2291	136	N-POH	40	1800	1	6	63.0	60	A
UNI-REZ® 2646	125	N-POH	40	1000	<2	<5	83.8	80	A, D
UNI-REZ® 2228	113	N-POH	50	570	1	3	80.7	80	A
UNI-REZ® 2281	115	N-POH	50	370	3	3	80.0	80	A, C
UNI-REZ® 2209	123	N-POH	50	365	2	3	82.4	80	A, C
UNI-REZ® 2215	118	N-POH	50	300	3	2	78.0	80	No FDA Clearance
UNI-REZ® 2218	122	N-POH	50	290	4	3	76.8	80	No FDA Clearance
UNI-REZ® 2223	123	N-POH	50	285	3	4	77.8	80	A, C
UNI-REZ® 2229	117	N-POH	50	260	3	3	78.6	80	A, C
UNI-REZ® 2238	117	N-POH	50	250	3	4	80.9	80	A, C
UNI-REZ® 2248	109	N-POH	50	205	5	3	81.4	80	No FDA Clearance
UNI-REZ® 2226	126	N-POH	50	195	3	2	77.9	80	A, C
UNI-REZ® 2239	113	N-POH	50	190	2	4	80.3	80	A, C
UNI-REZ® 2282	126	N-POH	50	175	3	4	76.8	80	A, C
UNI-REZ® 138*	111	N-POH	50	135	2	2	69.9	70	No FDA Clearance
UNI-REZ® 2221	110	N-POH	50	115	4	3	80.9	80	A, C
UNI-REZ® 2224	115	N-POH	50	60	3	2	79.2	80	No FDA Clearance
UNI-REZ® 106/1*	110	1:1 BUT:TOL	35	115	2	2	90.4	90	A, C, D, I
UNI-REZ® 1533*	100	1:1 BUT:TOL	35	110	5	5	83.9	80	A, C, D, E, F, I, J
UNI-REZ® 2931	110	1:1 BUT:TOL	35	100	2	3	90.2	90	A, C, D, I
UNI-REZ® 2930	110	1:1 BUT:TOL	35	90	2	3	90.2	90	A, C, D, I
UNI-REZ® 2940	110	1:1 BUT:TOL	35	65	2	3	90.2	90	A, C, D, I
UNI-REZ® 147*	104	1:1 BUT:TOL	35	65	2	2	89.1	90	A
UNI-REZ® 2934*	103	1:1 BUT:TOL	35	60	1	4	86.3	90	A, C
UNI-REZ® 2210	140	1:1 BUT:TOL	35	35	2	2	80.6	80	A
UNI-REZ® 110*	143	1:1 BUT:TOL	35	30	2	2	78.5	80	A

\* Predominantly for the European market.

## Resins for printing inks

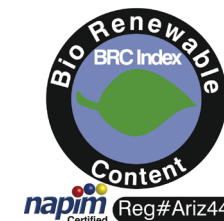
### FDA REFERENCE CODES:

A	175.105	Adhesives
B	175.125	Pressure Sensitive Adhesives
C	175.300	Resinous & Polymeric Coatings
D	175.320	Resinous & Polymeric Coatings for Polyolefin Film
E	176.170	Components of Paper & Paperboard in Contact with Aqueous & Fatty Foods
F	176.180	Components of Paper & Paperboard in Contact with Dry Foods
G	176.200	Defoaming Agents Used in Coatings
H	176.210	Defoaming Agents Used in Manufacture of Paper & Paperboards
I	177.1200	Cellophane
J	177.1210	Closure with Sealing Gaskets
K	177.2260	Filters Resin-Bonded
L	177.2600	Rubber Articles Intended for Repeated Use
M	177.2800	Textiles & Textile Fibers

*(When used in accordance with all appropriate and associated regulations)*

BRC INDEX	BIO-DERIVED RENEWABLE CONTENT RANGE
10	10.0. to 15.0%
20	15.1 to 25.0%
30	25.1 to 35.0%
40	35.1 to 45.0%
50	45.1 to 55.0%
60	55.1 to 65.0%
70	65.1 to 75.0%
80	75.1 to 85.0%
90	85.1 to 95.0%
100	95.1 to 100%

*Weight % of formula*



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▼ LIQUID INK RESIN  
(polyamides)

	Flexography			
	Film/Foil	Cold Seal Release	Grease Resistance	Lamination
UNIREZ® 2291	•			•
UNIREZ® 2646	•			•
UNIREZ® 2228	•			•
UNIREZ® 2281	•			
UNIREZ® 2209	•			
UNIREZ® 2215	•			
UNIREZ® 2218	•			
UNIREZ® 2223	•			
UNIREZ® 2229	•			
UNIREZ® 2238	•			
UNIREZ® 2248	•			
UNIREZ® 2226	•			
UNIREZ® 2239	•			
UNIREZ® 2282	•			
UNIREZ® 138	•			
UNIREZ® 2221	•			
UNIREZ® 2224	•			
UNIREZ® 106/1	•	•	•	
UNIREZ® 1533	•		•	
UNIREZ® 2931	•	•	•	
UNIREZ® 2930	•	•	•	
UNIREZ® 2940	•	•	•	
UNIREZ® 147	•	•		
UNIREZ® 2934	•	•		
UNIREZ® 2210	•	•		
UNIREZ® 110	•	•		

# Arizona Chemical quality control

## AQCM 001, ACID NUMBER

Dissolve 1 gram of resin in a 1:2 isopropanol: toluene solution and titrate with 0.1 N methanolic KOH solution until a phenolphthalein endpoint (faint pink color persists for at least 15 seconds). Report results as mg KOH/g resin.

## AQCM 003, SOFTENING POINT

Fill a 2.80 mm bottom orifice sample cup of a Mettler FP90/FP83HT Cup and Ball apparatus with the molten resin to be tested. Place the sample cup in the cartridge with a lead ball (3.4±0.2 gram) centered on top of the sample and place in the furnace. The instrument rapidly heats to 20-25°C below the expected softening point then ramps at 1.5°C/min until the ball drops. Report results in °C.

## AQCM 004, BROOKFIELD VISCOSITY

Fill a Brookfield cell with 8.0 ml of the test resin solution, insert a #18 LVT spindle and position the adapter in a Brookfield DV-II+ rotational viscometer. Equilibrate the temperature to 25°C for 5 minutes before starting, then engage the motor and adjust the speed to obtain approximately 50% of full scale torque. Report results as centipoises (cps) @ 25°C.

## AQCM 059, CLOUD POINT DETERMINATION USING A CHEMOTRONIC CLOUD POINT TESTER

Weigh 2.0 g of crushed resin and 18.0 g of the test solvent into a Chemotronic glass test tube. Place the tube in the Chemotronic and insert a PT-100 temperature probe. The solution is heated to 230°C at 40°C/min, held at 230°C for 2 minutes, then cooled at 40°C/minute until the Chemotronic detects and reports the cloud point in °C.

## AQCM 069, AMINE NUMBER

Dissolve a 5 gram sample of resin in 1:1 n-butanol: toluene and titrate with 0.1 N alcoholic HCl solution until a bromphenol blue indicator endpoint (color changes from blue to yellow). Report results as mg KOH/g resin.

## AQCM 072, RHEOLOGY FLOW MEASUREMENTS

Measure resin solution flow viscosity using a physica rheometer in flow mode at 23°C. Apply a shear rate of 25 s<sup>-1</sup> for 1 minute with 49 measurement points collected. The final measurement point is taken as the flow viscosity and is reported in Pa.s at 23°C.

# Sustainable solutions globally

Arizona Chemical has principal executive offices in Jacksonville, USA and Almere, the Netherlands.

We have ten production sites in the US and Europe. Through our global network of more than 60 sales offices and distributors, we are able to serve our customers all over the world.



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