

# Acrylics for DTM Applications



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# NeoResins Acrylics for DTM Applications

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# Advantages of Blending Acrylics with Water Reducible Alkyds

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- Shortens dry time
- Improves hardness development
- Can decrease resin costs
- Improves humidity resistance
- Maintains gloss
- Maintains salt fog resistance



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# Drawbacks of Acrylic Modification of Water Reducible Alkyds

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- Need flow and leveling additives
- May increase resin costs
- May decrease salt fog resistance

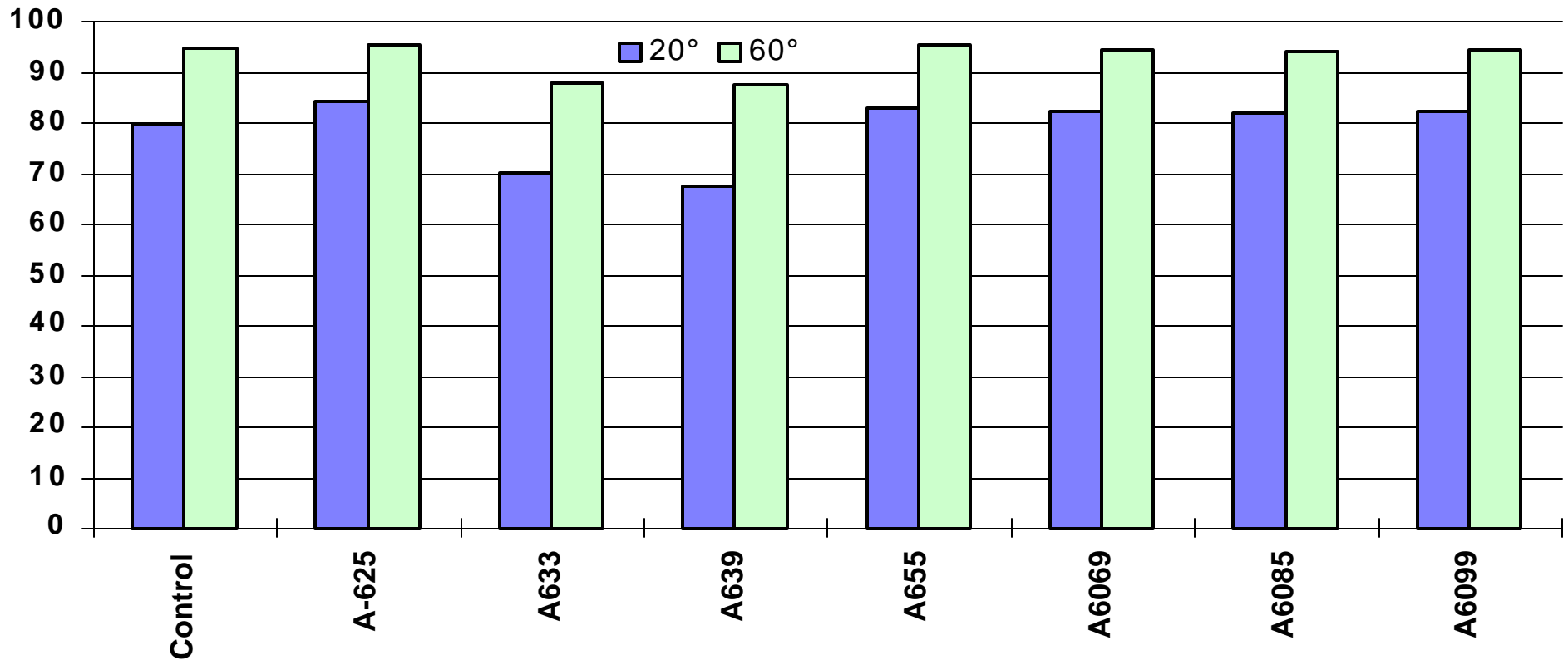


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# Gloss of WR Alkyd-Acrylic Blends

Gloss of 50% Acrylic Blends with WR Alkyd Kelsol 3941

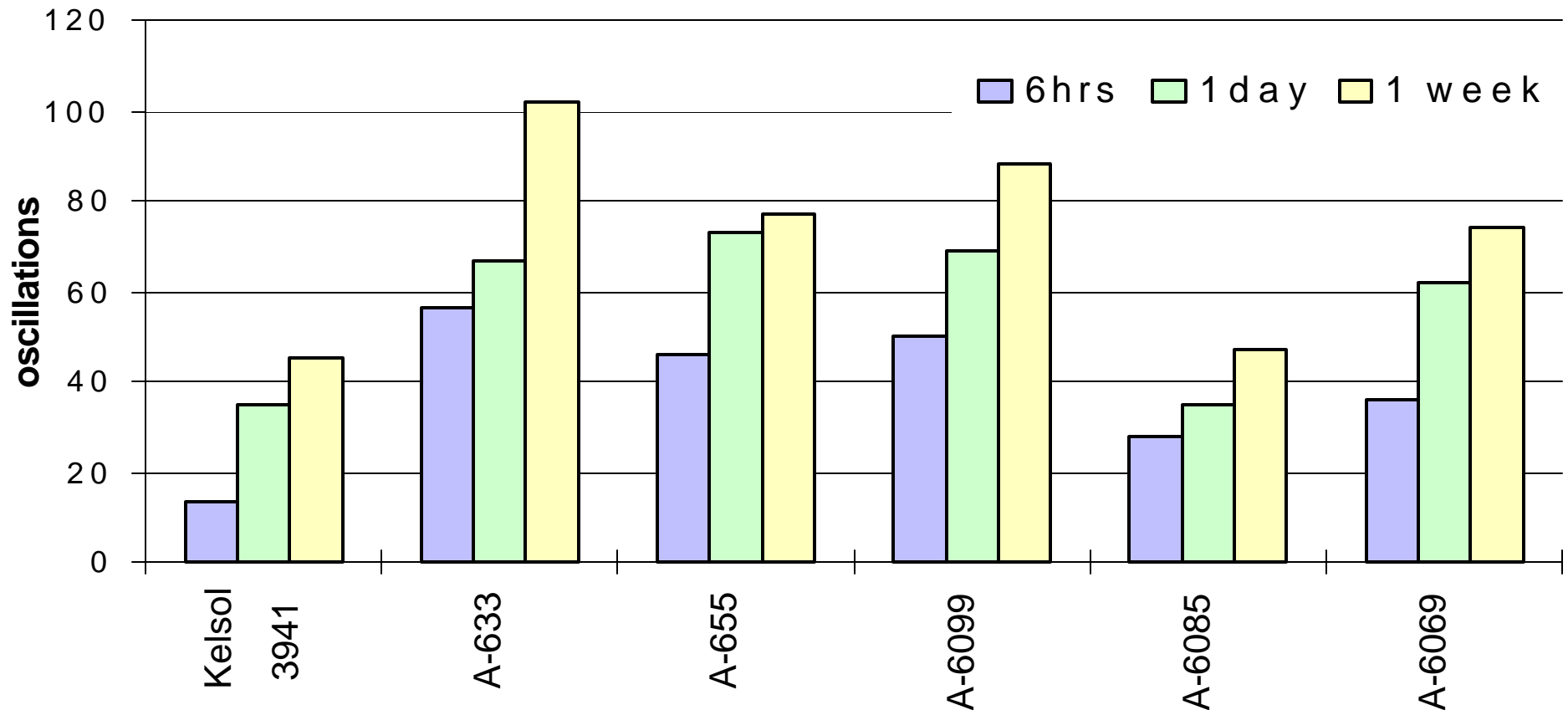


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# Effect of Acrylics on Hardness of Water Reducible Alkyd

Konig Hardness of 50% Acrylic Blends with Kelsol 3941

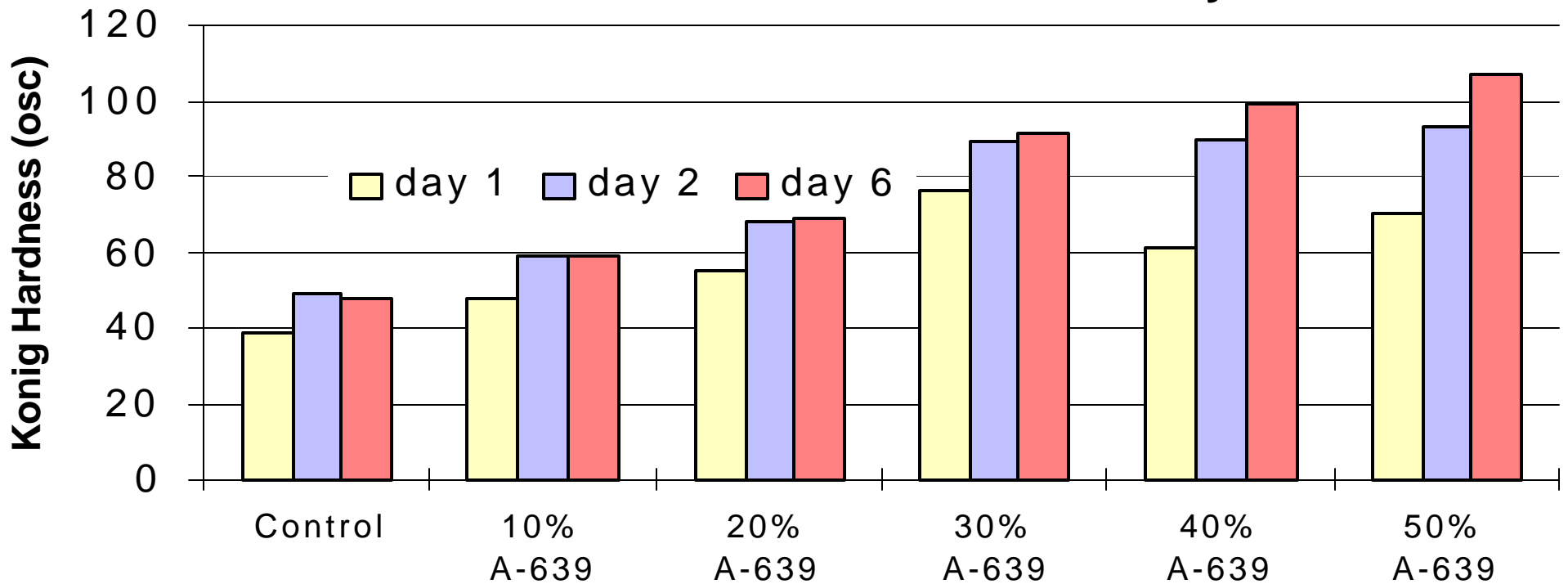


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# Effect of A-639 on Konig Hardness of Kelsol 3941

## Effect of Acrylic Modification on Konig Hardness of Water Reducible Alkyds



**A-639 modifications of Reichhold 3941-B2G2-70**

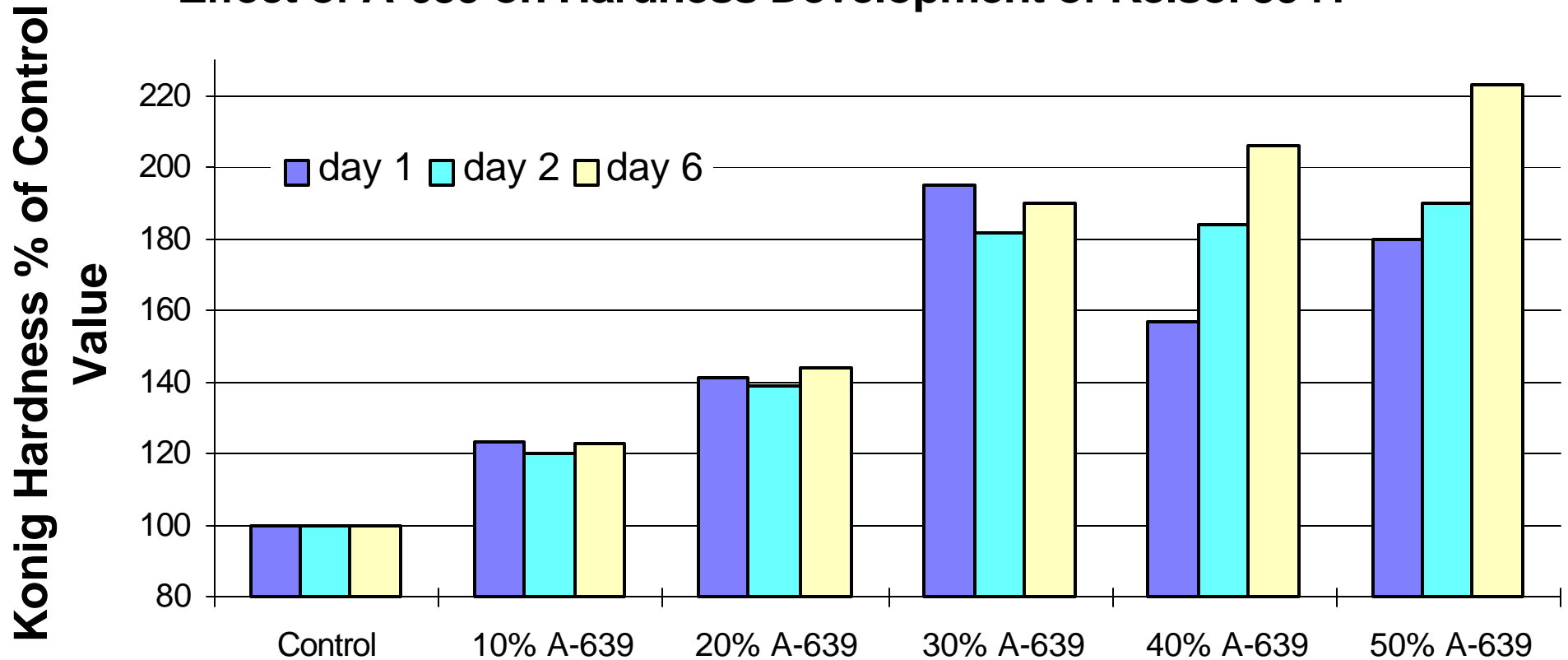


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# Percent Hardness Improvement

## Effect of A-639 on Hardness Development of Kelsol 3941

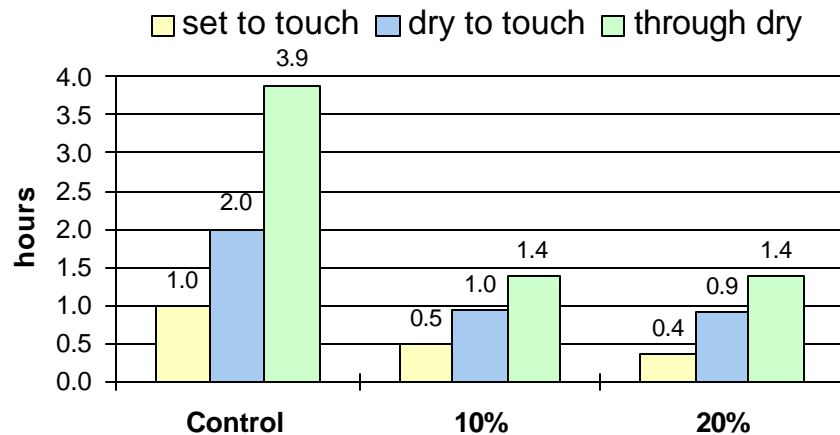


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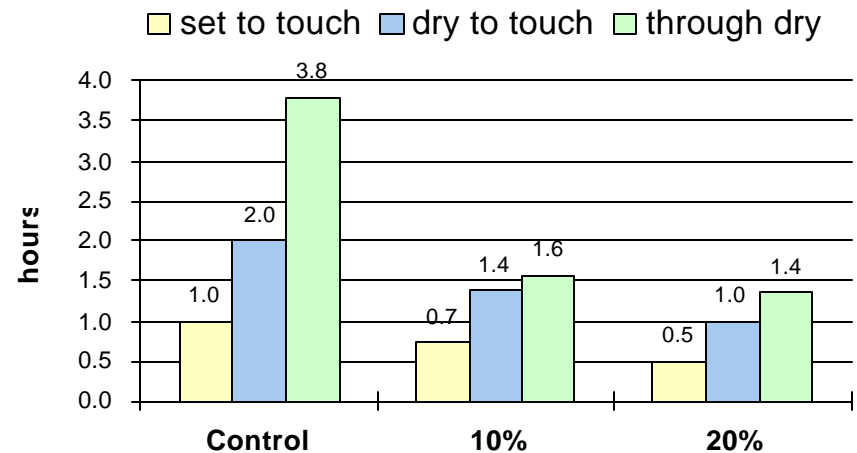
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# Drytime of Various WR Alkyds Blended with NeoCryl A-639

## Effect of NeoCryl A-639 on Chempol 10-0091

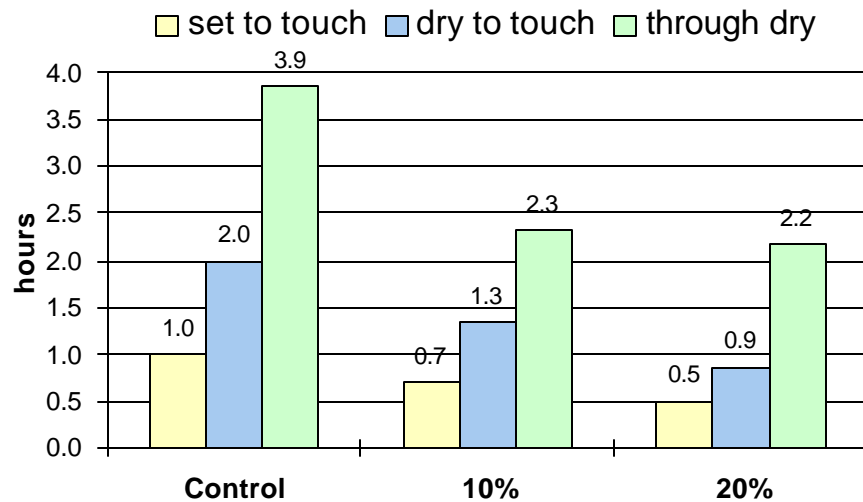


## Effect of NeoCryl A-639 on Kelsol 3906

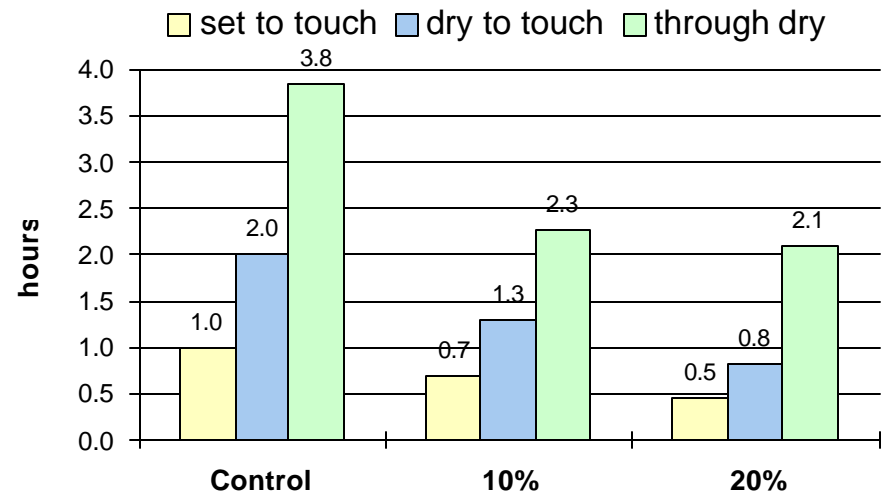


# Drytime of Various WR Alkyds Blended with NeoCryl A-639

## Effect of NeoCryl A-639 on Kelsol 3960

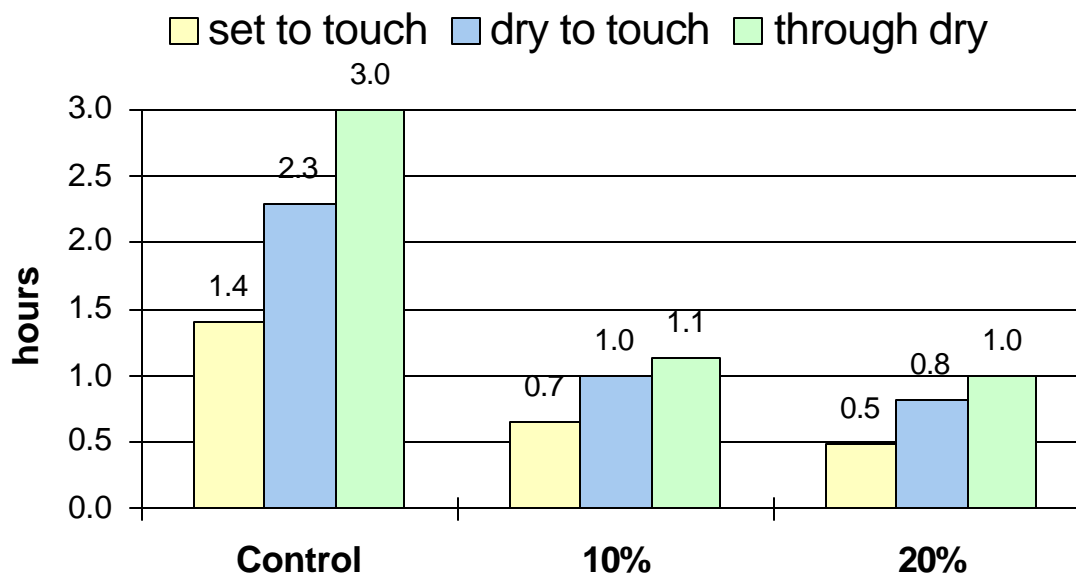


## Effect of NeoCryl A-639 on Kelsol 3961



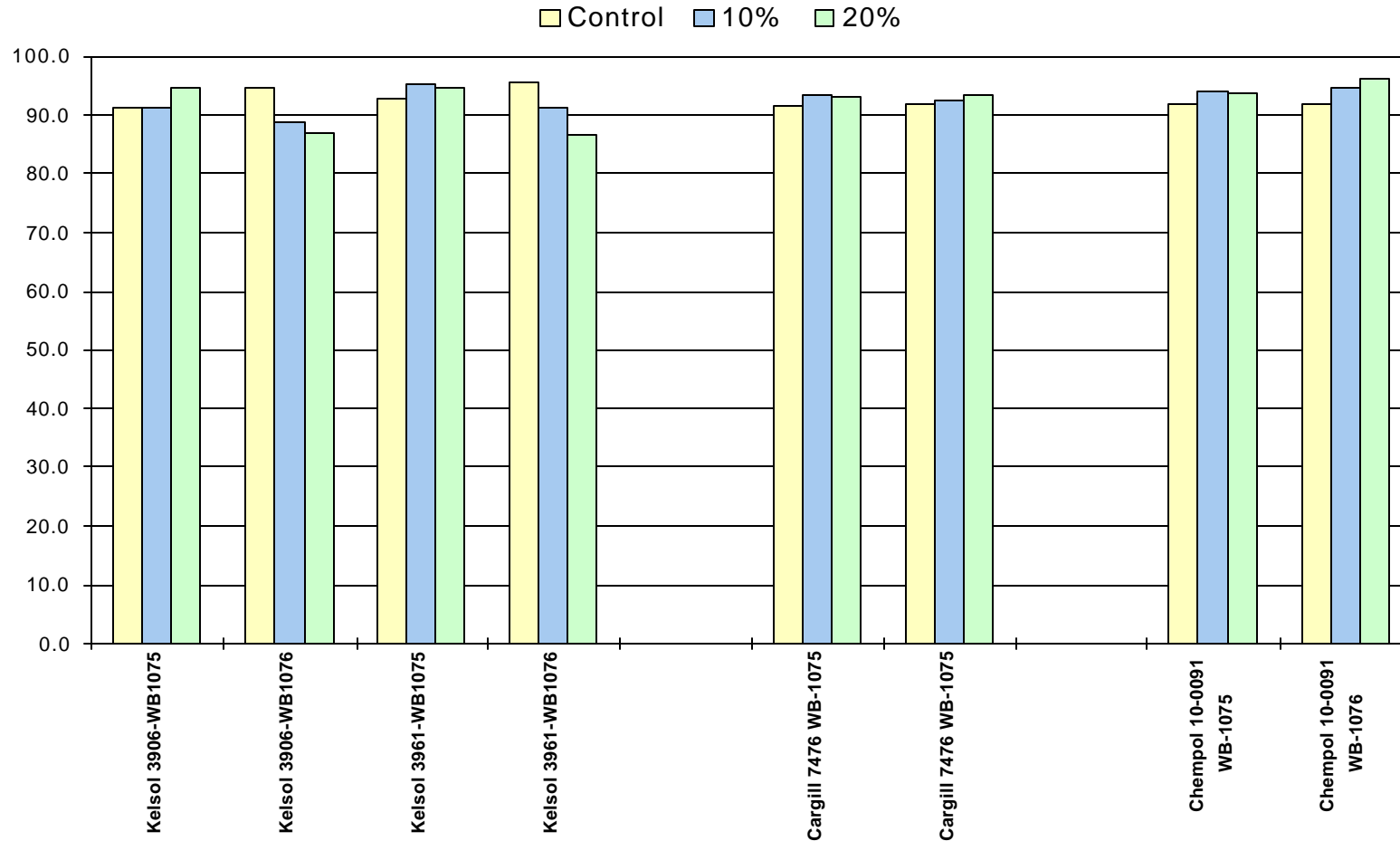
# Drytime of Various WR Alkyds Blended with NeoCryl A-639

## Effect of NeoCryl A-639 on Cargill 7476



# Gloss of Various WR Alkyds Blended with NeoCryl A-639

Effect of A-639 on 60° Gloss of WR Alkyds



# Water Resistance-Controlled Condensation & Water Immersion

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## 147 hour Controlled Condensation (Cleveland Cabinet)

0.85 DFT on CRS air dry 7 days

	<b>Kelsol 3941</b>	<b>K3941/A6085</b>	<b>K3941/A655</b>	<b>K3941/A6099</b>	<b>K3941/A6069</b>	<b>K3941/A639</b>	<b>K3941/A633</b>
<b>Blistering</b>	medium #4	none	few #6	none	none	none	none
<b>Rusting</b>	8	9	flash	flash	8	9	9
<b>Whitening</b>	moderate	slight	localized severe	severe	localized severe	severe	severe

## 168 hours Immersion @ 100°F

0.85 DFT on CRS air dry 7 days

	<b>Kelsol 3941</b>	<b>K3941/A6085</b>	<b>K3941/A655</b>	<b>K3941/A6099</b>	<b>K3941/A6069</b>	<b>K3941/A639</b>	<b>K3941/A633</b>
<b>Blistering</b>	none	none	none	none	few #2 & #4	dense #8	none
<b>Rusting</b>	9	10	8	10	3	5	7
<b>Whitening</b>	moderate	slight	severe	severe	moderate	moderate	severe



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# Oven Stability

## Gloss White at 50% acrylic modification with Kelsol 3941-B2G2-70

		10 days	20 days	30 days
48N-99	<b>Kelsol control</b>	pass	fail-viscous	-
48N-100A	<b>A-633</b>	pass	pass	pass
48N-100B	<b>A-639</b>	pass	pass	pass
48N-101A	<b>A-655</b>	pass	skinning	skinning
48N-101B	<b>A-6069</b>	pass	sl. skinning	sl. skinning
48N-102A	<b>A-6085</b>	pass	pass	pass
48N-102B	<b>A-6099</b>	fail-gelled	-	-
48N-103A	<b>A-1044</b>	pass	skinning	skinning
48N-103B	<b>A-625</b>	pass	pass	pass



# Light Duty Maintenance Benchmark

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- Compared NeoResins NeoCryl A-6085 and A-6099 and a 50% blend of A-6085 and A-6099 with two top selling maintenance acrylics
- Resins were tested in both the NeoResins and competitor's starting point formulations
- Coatings tested at 1.5 mil DFT directly on cold rolled steel cured for 7 days at room temperature

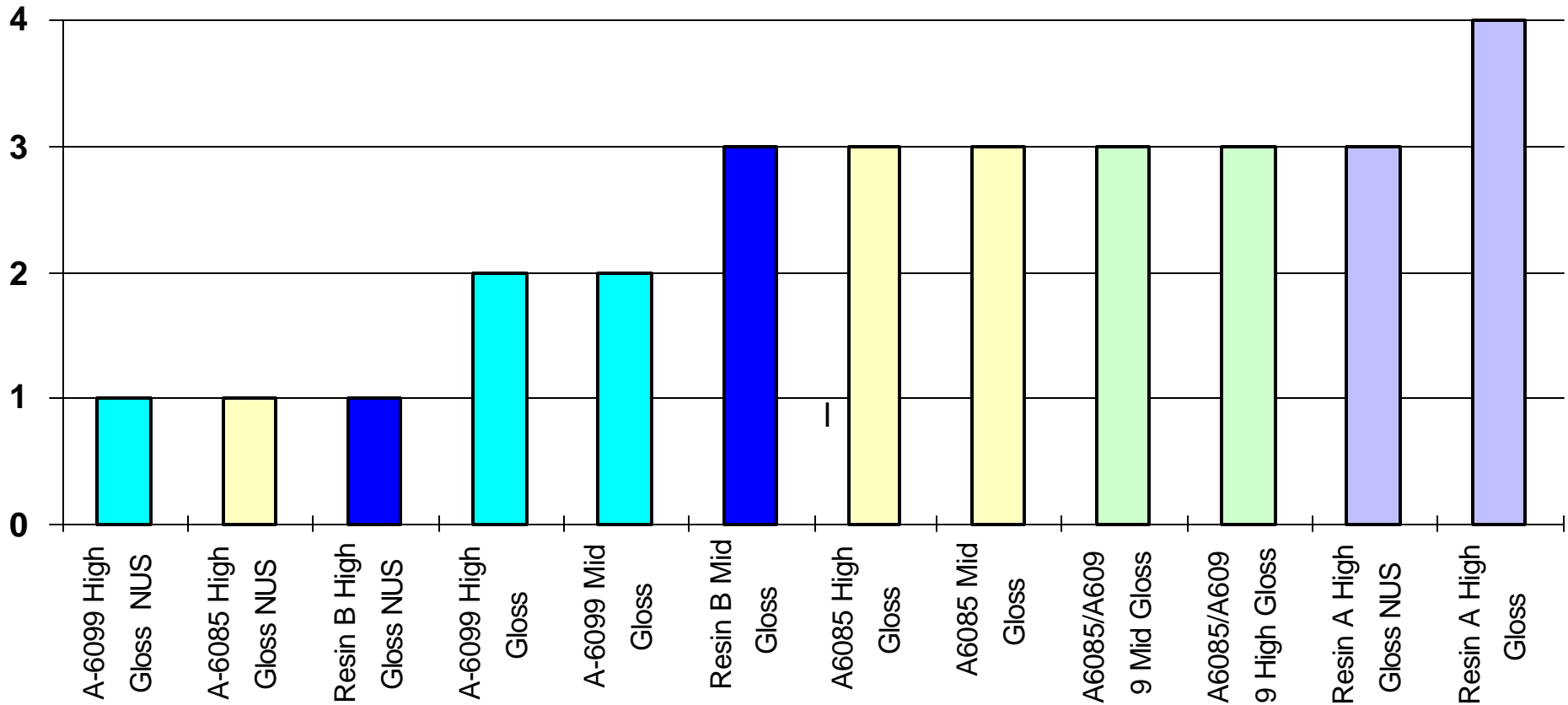


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# Light Duty Maintenance Benchmark

## Salt Spray 312 Hours

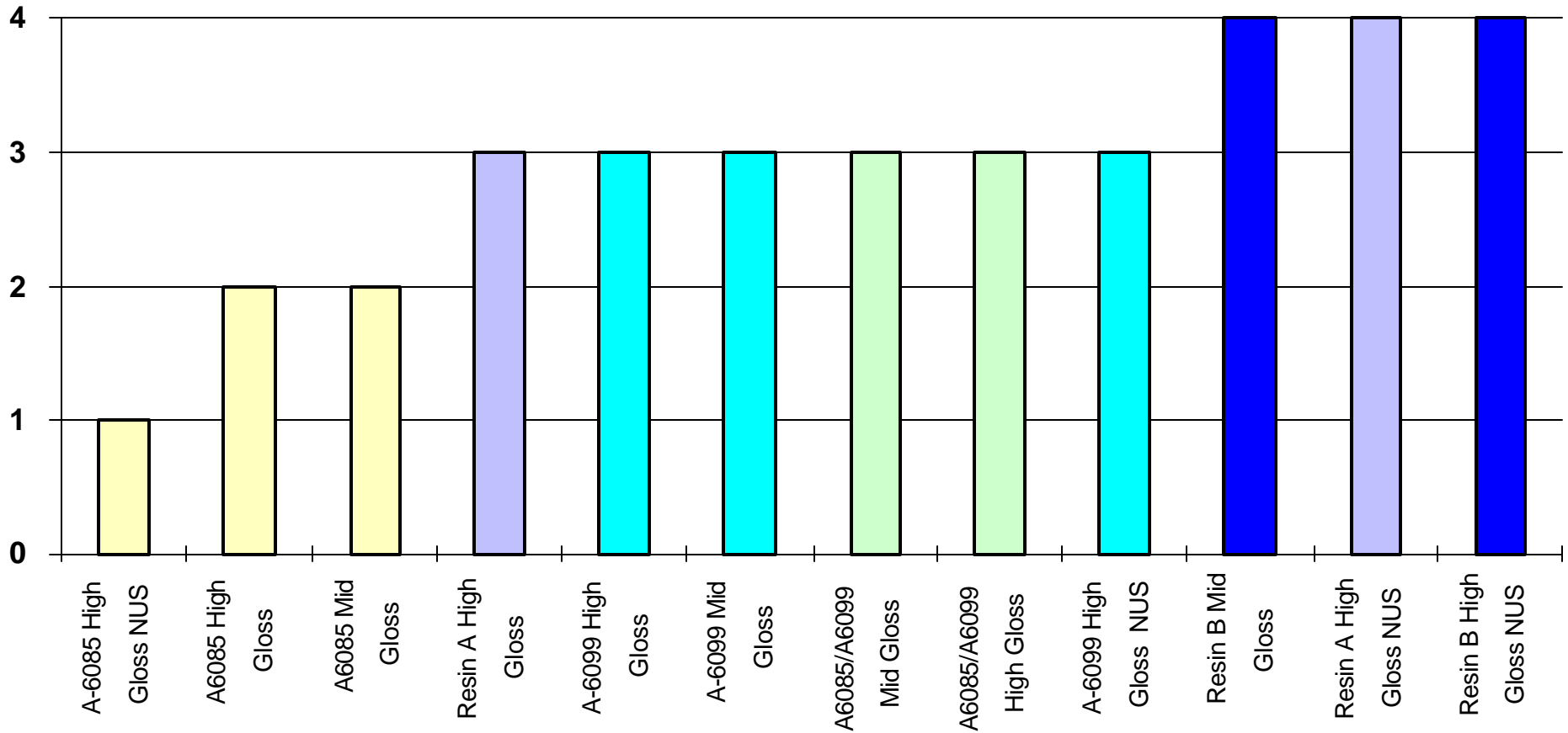


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# Light Duty Maintenance Benchmark

Water Immersion 168 Hours

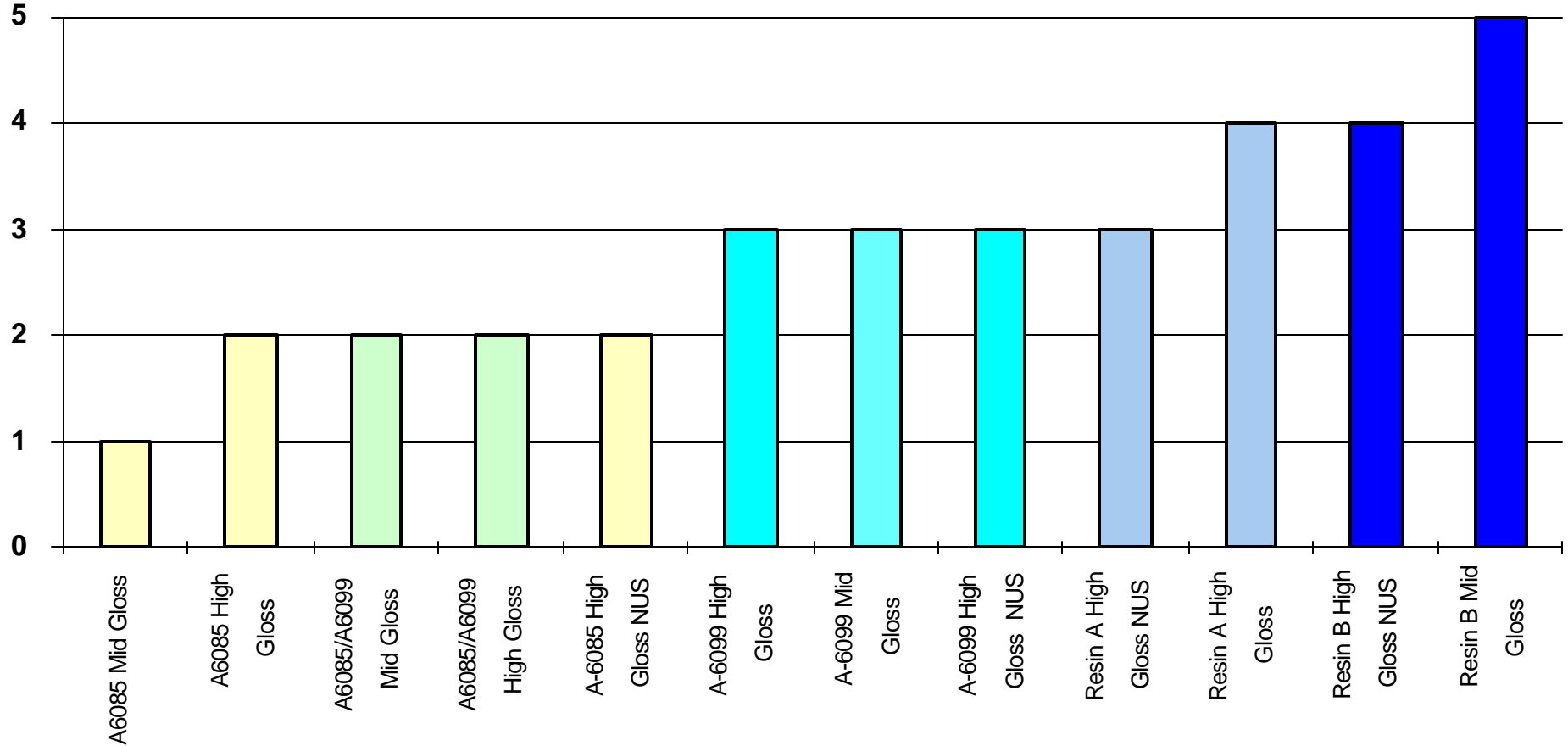


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# Light Duty Maintenance Benchmark

Controlled Condensation 168 Hours

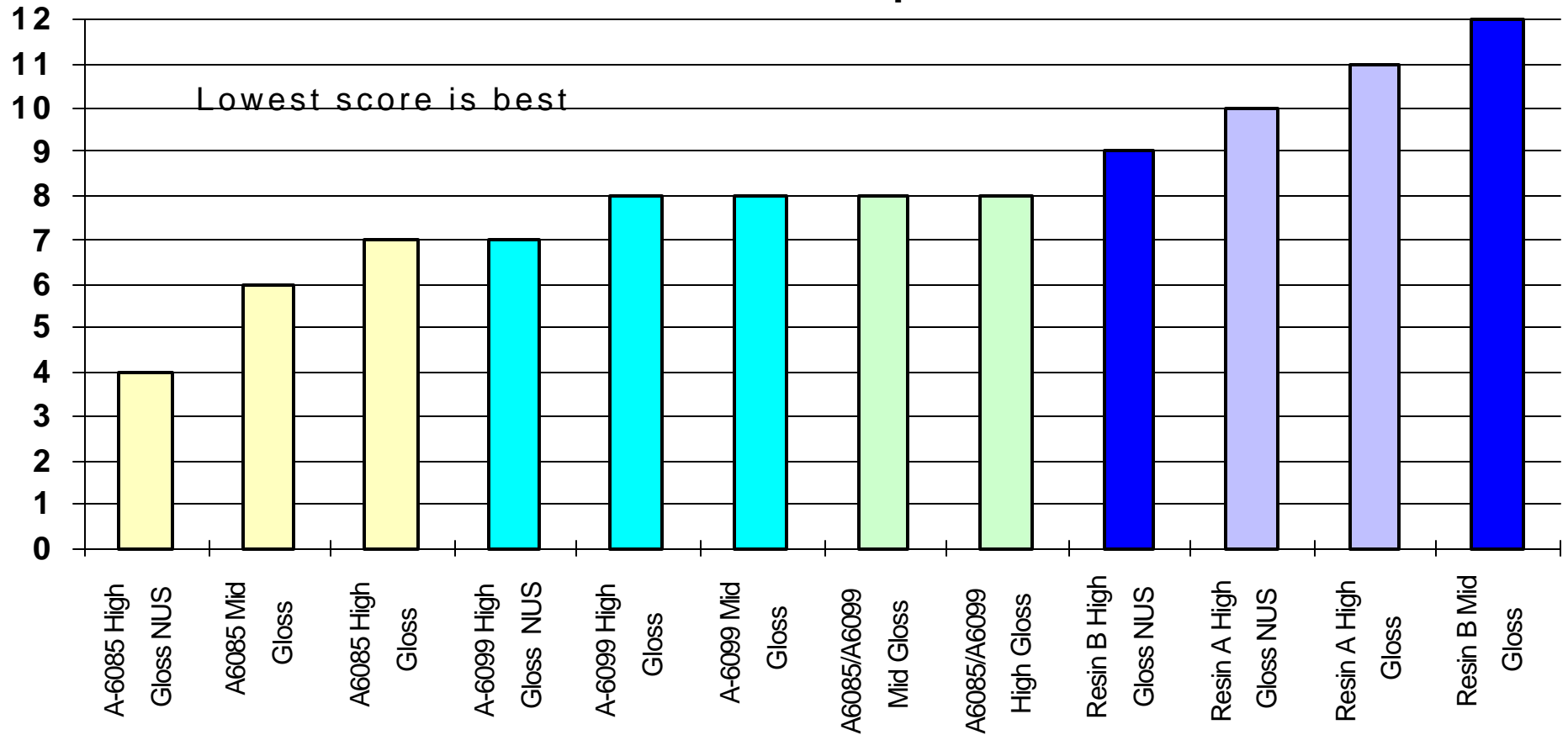


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# Light Duty Maintenance Benchmark

## Total Score of Three Exposure Tests



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# Benchmark for DTM Coatings

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- Two NeoResins coatings were compared with two commercially available, top selling DTM products
- NeoCryl XK-241 and a 50% blend of XK-241 with A-6085 were formulated into a DTM coating
- Thirteen performance tests were run comparing the commercial products with the NeoResins' formulations



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# Benchmark for DTM Coatings

	Commercial A	Commercial B	XK241	XK241/6085
<b>Hand Lotion Resistance (1 &amp; 24 Hour Spot)</b>	Fair	Very Good	<b>Excellent</b>	<b>Excellent</b>
<b>Dry Adhesion (24 Hour &amp; 7 Day)</b>	Poor	Good	Very Good	Good
<b>Wet Adhesion (24 Hour &amp; 7 Day)</b>	Poor	Poor	Good	Good
<b>Gloss</b>	Good	<b>Excellent</b>	<b>Excellent</b>	<b>Excellent</b>
<b>Salt Spray Resistance</b>	Poor	Poor	<b>Excellent</b>	<b>Excellent</b>
<b>Water Immersion</b>	<b>Excellent</b>	Very Good	Good	<b>Excellent</b>
<b>Controlled Condensation</b>	Poor	<b>Excellent</b>	Very Good	<b>Excellent</b>
<b>Block Resistance</b>	Very Good	Very Good	Fair	Good
<b>Early Water Spot Resistance</b>	Good	Good	Very Good	Very Good
<b>Chemical Resistance</b>	Good	Very Good	Very Good	Very Good
<b>Oven Stability</b>	<b>Excellent</b>	<b>Excellent</b>	<b>Excellent</b>	<b>Excellent</b>
<b>Low Temperature Coalescence</b>	<b>Excellent</b>	Poor	<b>Excellent</b>	<b>Excellent</b>
<b>Impact Resistance</b>	Good	Good	Fair	<b>Excellent</b>



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# Summary

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- Water Reducible Alkyds may be modified with up to 50% of several NeoResins acrylics with improved dry time and excellent water resistance
- Formulations based on NeoCryl A-6085, A-6099 and 50% blend of A-6085/A-6099 exhibit superior performance when compared to top selling maintenance resins in DTM coatings
- Formulations based on NeoCryl XK-241 and XK-241/A-6085 exhibit superior performance when compared to top selling DTM commercial products.



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