

SYNAQUA® 4804

WATERBORNE ALKYD



Product Description

SYNAQUA® 4804 is an APEO and ammonia free short oil alkyd emulsion designed for use in a wide variety of coatings in which performance similar to solvent based alkyds are desired. It offers the coatings formulator a low VOC option to develop the highest gloss products while giving the application feel of a solvent based alkyd.

Typical Applications

- High gloss trim paints
- Wall and Ceiling paints from flats to high gloss
- Interior/ Exterior primers for wood and metal
- Direct-To-Metal coatings with anticorrosive properties
- Transparent and semi-transparent stains

Polymer Design

- Short oil alkyd
- APEO and ammonia- free
- Low VOC capable < 50 g/L

Performance Benefits

- High gloss potential and excellent gloss retention
- Very good hardness
- Quick dry time
- Low yellowing
- Good stability with anticorrosive pigments
- Good application characteristics
- Outstanding resin for blending with other technologies, including styrene acrylics, acrylics and polyurethane dispersions.

Typical Properties¹

Total Solids, % by weight	50+/- 1.0 %
Viscosity	300 cps
Density	8.9
pH Value	7.0
Color	Milky white
Solvent	Water

¹The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.

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Waterborne Alkyd Test Formula: <50 g/l

Material	Description	Lbs/100 gal	Gallons
Grind			
Water		46.80	5.61
Propylene Glycol		12.56	1.45
COADIS® BR85	Dispersant – COATEX	15.18	1.66
AMP-95		0.52	0.07
DEE FO PI-16P	Defoamer	1.83	0.22
R 706	TiO ₂	276.93	8.32

Letdown

SYNAQUA® 4804	Alkyd Emulsion – Arkema	666.92	74.52
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add GRIND portion (353.8) to SA 4804 (666.9) with good mixing

DRICAT 507	Drier Blend	4.76	0.52
ANTISKIN-MEKO	Anti-Skin	1.76	0.23
Water		35.69	4.28
COAPUR XS 22	Urethane Thickner – COATEX	15.20	1.75
COAPUR 817W	Urethane Thickner – COATEX	10.14	1.17
ACTICIDE MBS	MIT/BIT Preservative	1.76	0.21
TOTAL		1090.1	100.00

Formula Properties

P/B=	0.78
% PVC=	18.5
% wt solids=	57.8
% vol solids=	44.8
VOC (g/L)=	42

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Performance Comparison

The film performance of SYNAQUA® waterborne alkyd was compared to the performance of two commercially-available waterborne alkyds

Competitor A

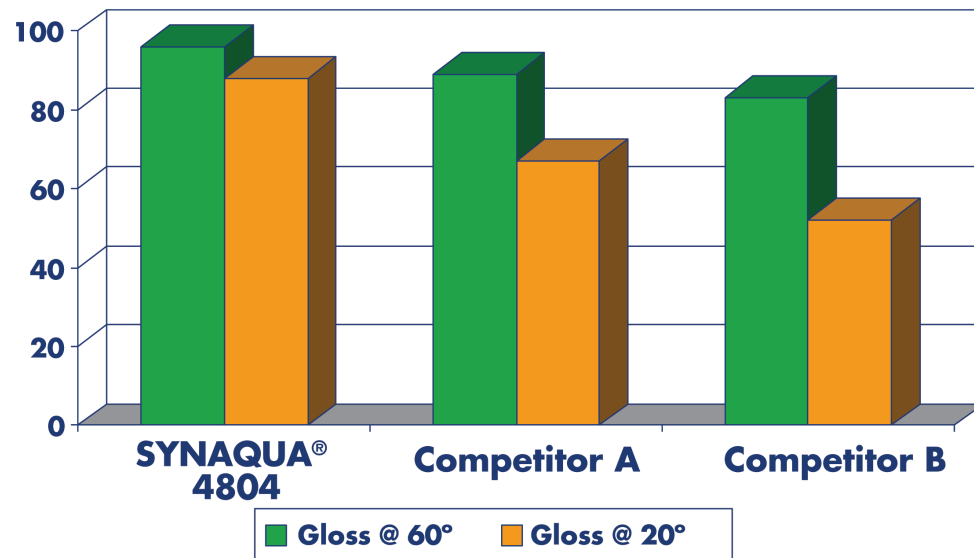
Polyurethane modified, medium oil alkyd emulsion

Competitor B

Alkyd Acrylic Hybrid

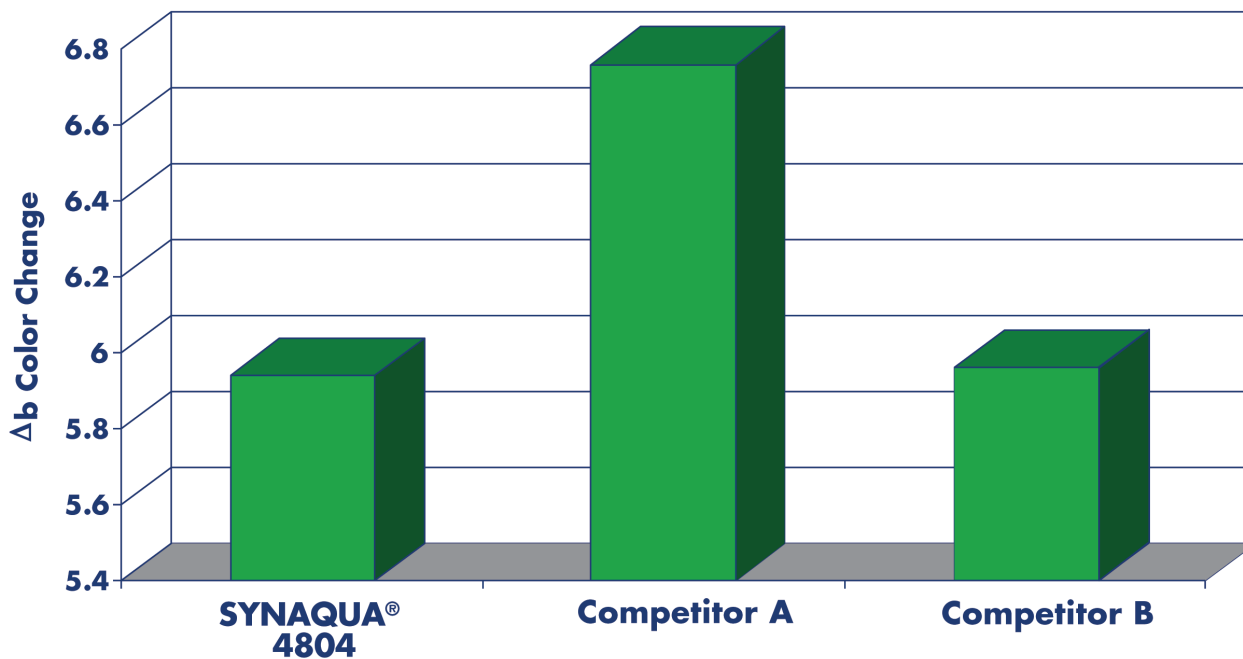
Gloss

- SYNAQUA® 4804 offers very high 20° gloss potential
- SYNAQUA® 4804 displayed better 20° gloss than the two competitive products



Yellowing

- Yellowing evaluated upon film exposure to ammonia vapor environment
- SYNAQUA® 4804 shows slightly better performance than Competitor B and significantly better yellowing resistance than Competitor A

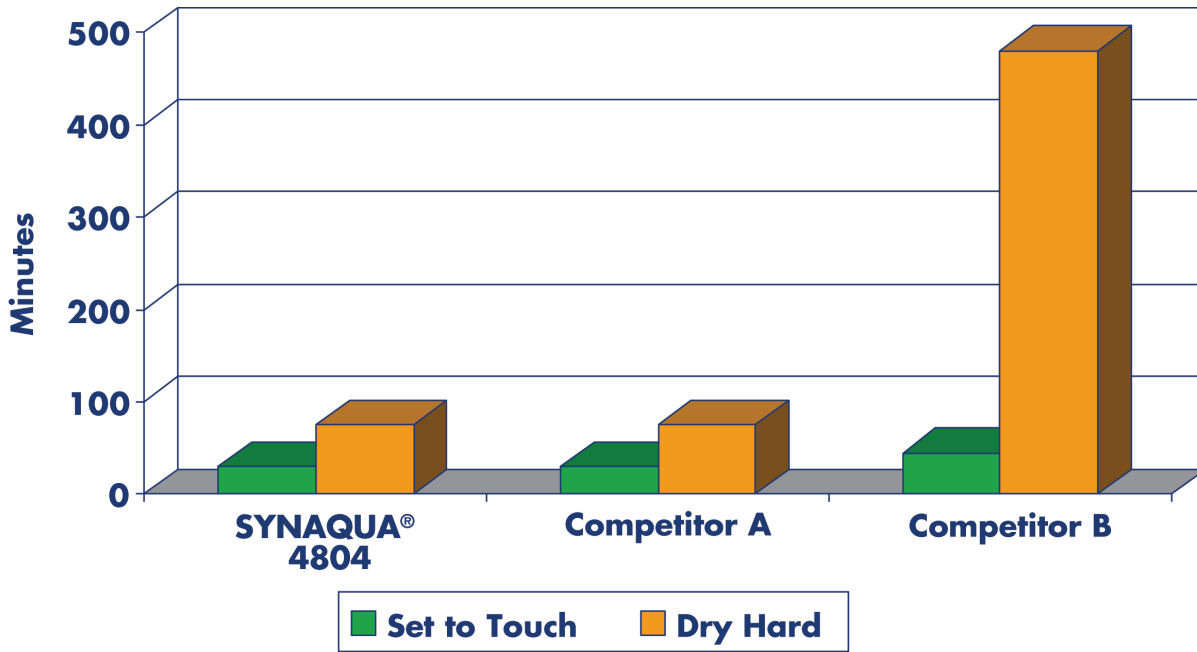


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WATERBORNE ALKYD

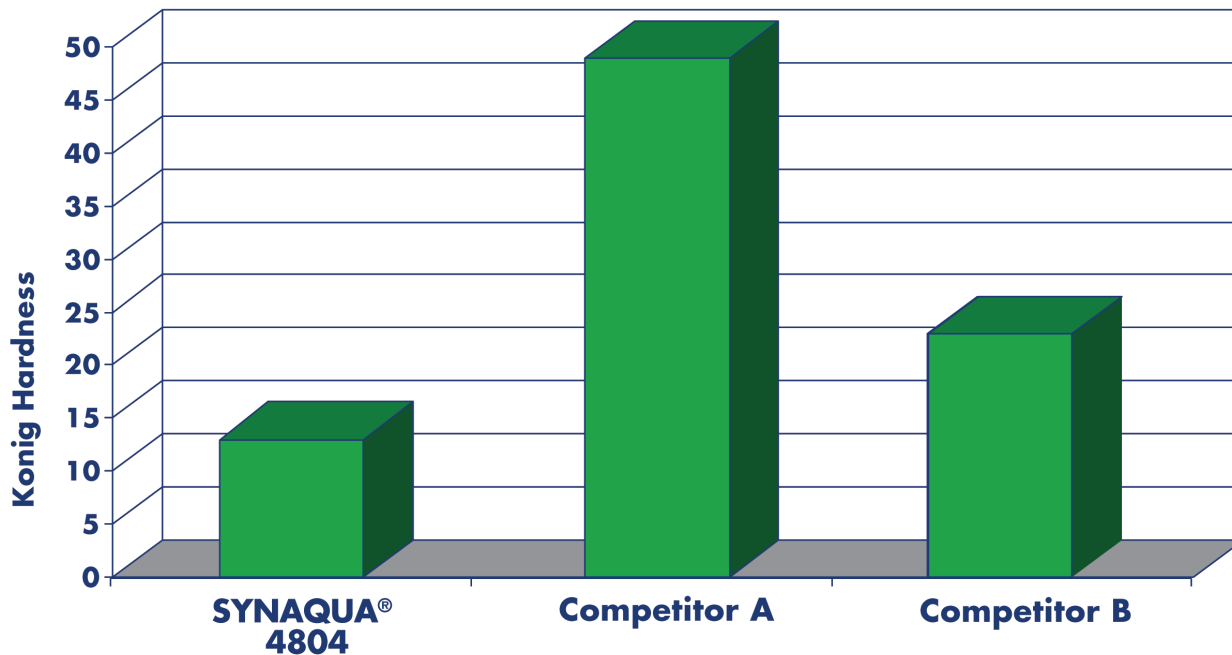
Dry Time

- SYNAQUA® 4804 has a dry time comparable to Competitor A; faster dry hard than Competitor B.



Hardness

- SYNAQUA® 4804 offers good hardness development for typical decorative trim enamel applications.

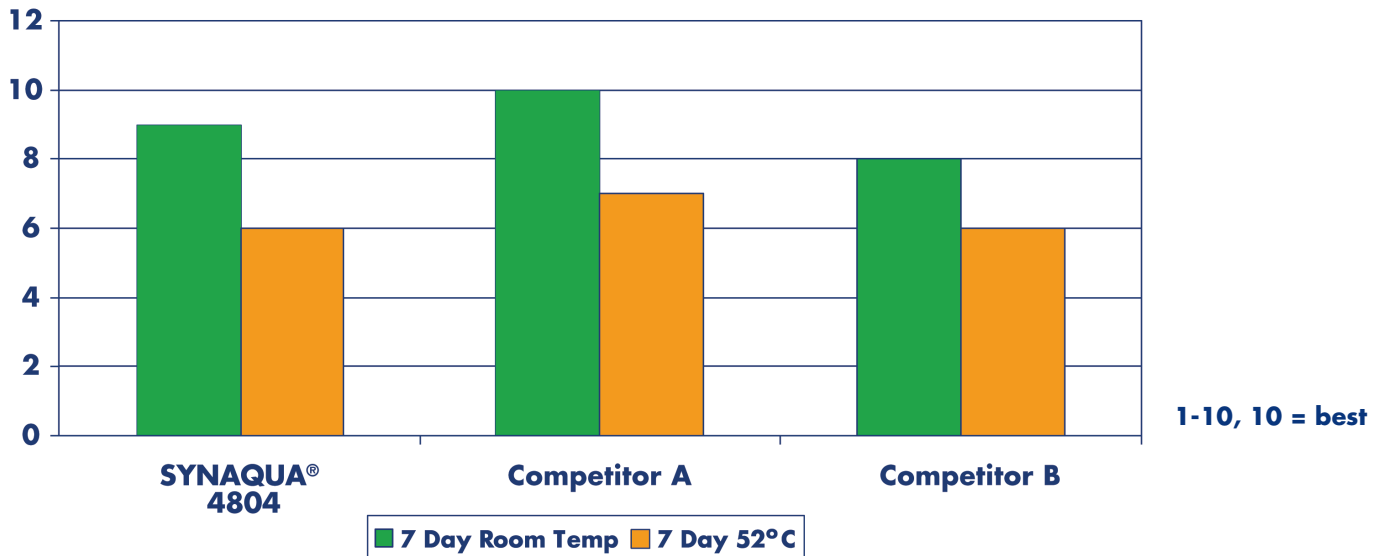


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Block Resistance

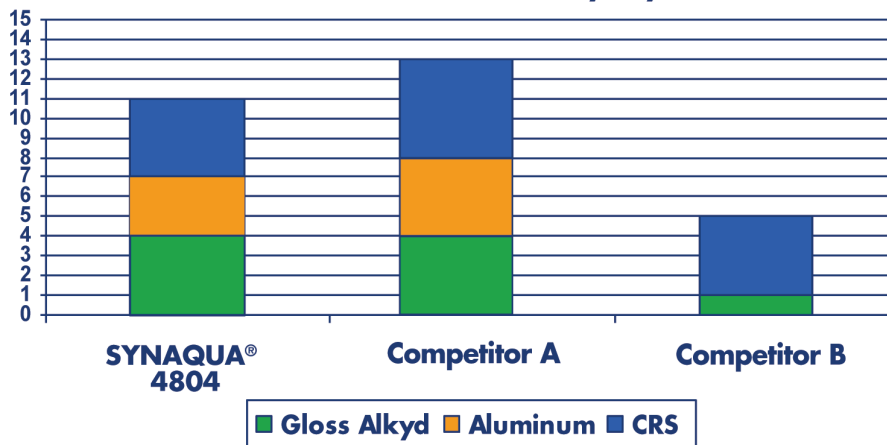
- SYNAQUA® 4804 develops good block resistance similar to competitive waterborne alkyd resins.



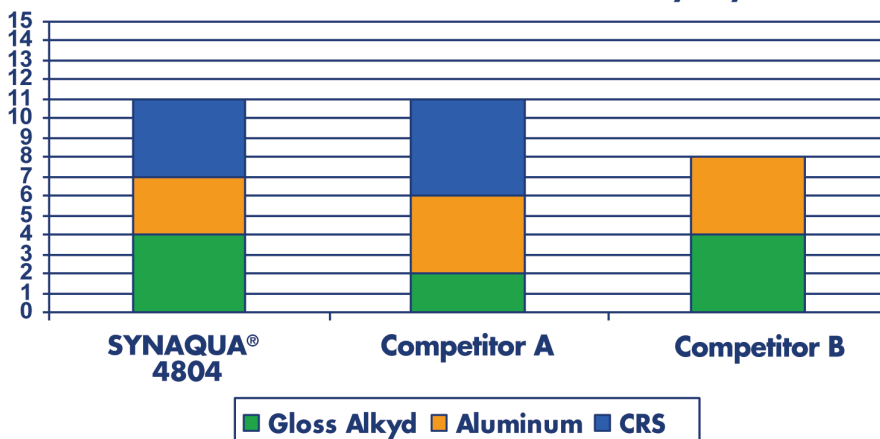
Adhesion

- SYNAQUA® 4804 offers good multi-substrate adhesion characteristics on both wet and dry adhesion.

Crosshatch Adhesion, 7-Day Dry



Wet Film Crosshatch Adhesion, 7-Day Dry

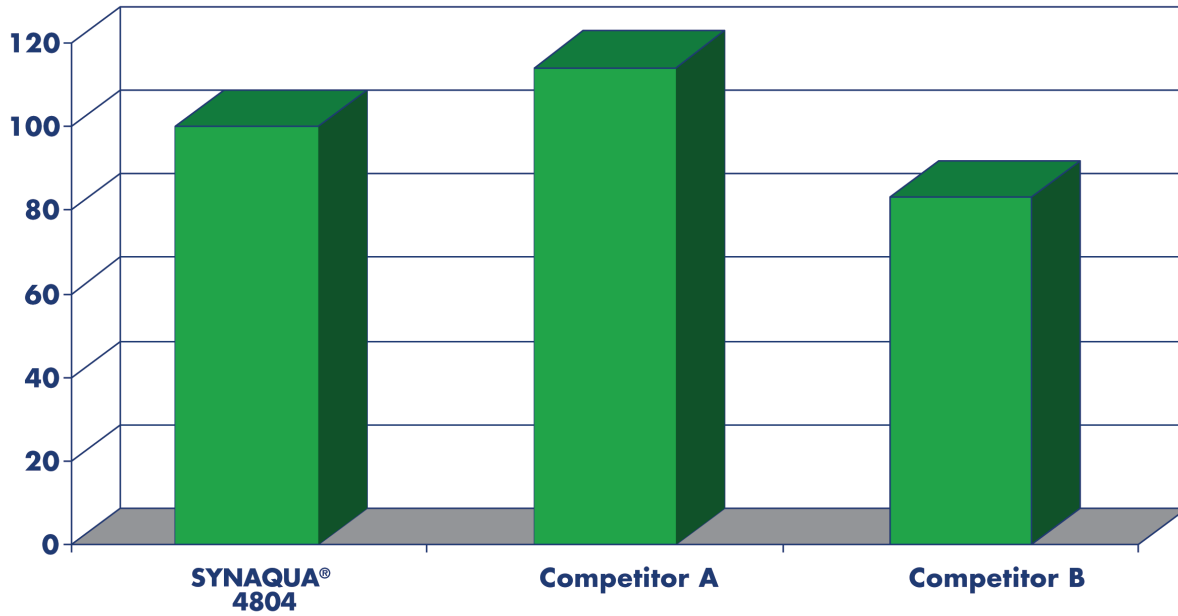


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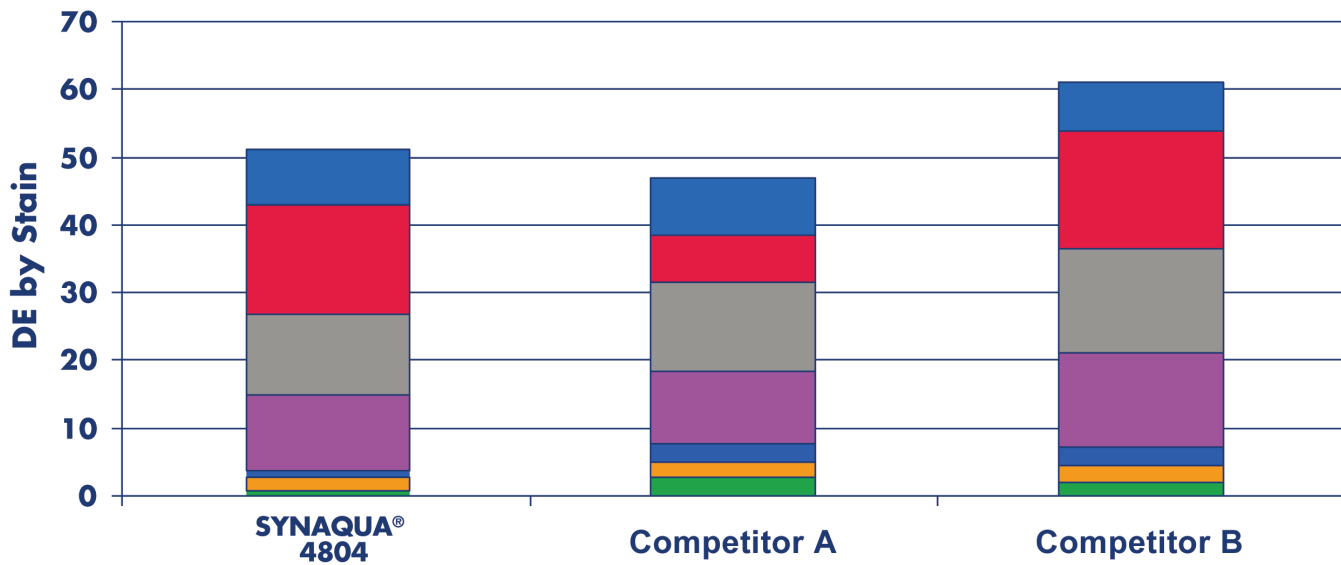
Scrub Resistance

- SYNAQUA® 4804 shows good scrub resistance potential compared to competitive waterborne alkyds.



Washability

- SYNAQUA® 4804 shows good overall washability performance.



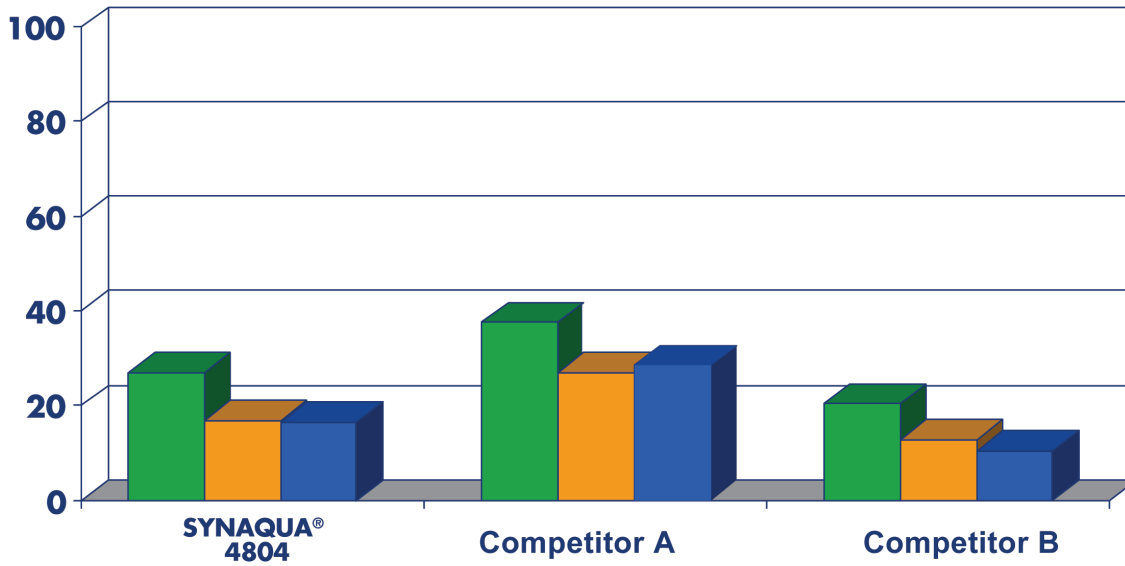
■ Red Lipstick ■ Mustard ■ Coffee ■ Purple Crayon ■ Pencil ■ Black China Marker ■ Blue Ink Pen

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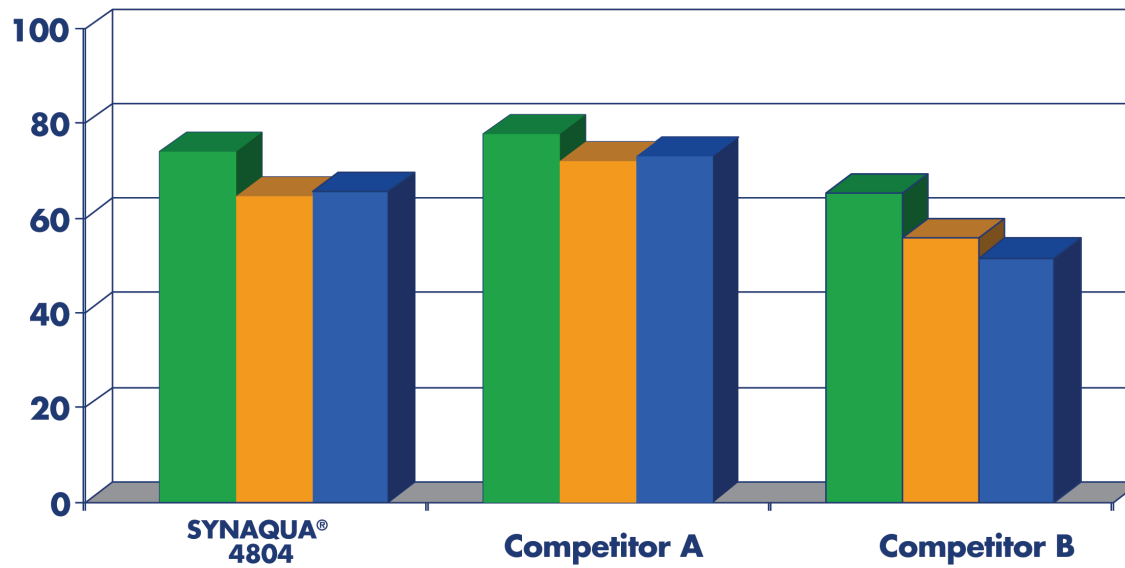
Gloss Retention

- UVA/Condensation Exposure, 20 degree gloss



Gloss Retention

- UVA/Condensation Exposure, 60 degree gloss



Formulation Tips

Dispersing agent

- Maximize performance with correct dispersing agent choice. COADIS™ BR85 from COATEX® or DISPERBYK 190 from Byk Chemie are recommended.

Thickeners

- Rheology and viscosity can be controlled by using associative thickeners: HEUR thickeners (e.g. XS 22 or 830W from COATEX®), or Hydrophobically modified polyether thickeners (e.g. Aquaflo NHS 300 and Aquaflo NLS 205 from Ashland-Aqualon)
- HASE thickeners are not recommended

Driers

- Use driers developed for water based coatings. Options include: Plurimetallic driers such as DriCat 507 or Additol VXW6206 from Cytec at 1.5% on dry resin, Cobalt as the sole drier, at 0.1-0.15% metal on resin solids, or Cobalt free sole drier options such as 0.2-0.3% Borch® Oxy-Coat from OMG-Borchers.

Defoamers

- Surfynol DF58, MD20 (Air Products), Byk 022, 028, 093 (Byk Chemie), Tegofoamex 902W (Tego), Foamstar A38 (Cognis) can be used without adversely affecting paint performance.

Additional Formulation and Processing Tips

- It is not recommended to use SYNAQUA® 4804 in the millbase.
- Unlike solvent-based alkyds, no anti-skinning agent is required when formulating with SYNAQUA® 4804.
- SYNAQUA® 4804 may be blended with other technologies such as styrene acrylic/ acrylic dispersions or polyurethane dispersions; Compatibility should be checked carefully in each system.

Summary

- SYNAQUA® 4804 offers the coatings formulator a waterborne alkyd technology that has broad formulation capability and outstanding performance.
- Highlighted Performance Properties
 - Excellent high gloss potential and gloss retention
 - Very good hardness
 - Quick dry time
 - Low yellowing
 - Good stability with anticorrosive pigments
 - Excellent application characteristics
 - Very good adhesion to a variety of substrates
 - Outstanding resin for blending with other technologies
 - Styrene acrylics
 - Acrylics
 - PUD dispersions

Product Safety

Before handling the materials listed in this bulletin, read and understand the product MSDS (Material Safety Data Sheet) for additional information on personal protective equipment and for safety, health and environmental information. For environmental, safety and toxicological information, contact our Customer Service Department at 1-866-837-5532 to find an MSDS, or visit our web site: www.arkemacoatingresins.com

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Storage and Handling

Follow procedures typically recommended for polymer dispersions. Use corrosion-resistant storage tanks and piping. Air-operated diaphragm pumps are preferred. Avoid temperature extremes. Do not freeze; store between 4-40°C.



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