

A Messy Cook's Guide to Kitchen Cabinet Coatings (A Technology Discussion)

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Discussion Topics

- Kitchen Cabinet Coatings and Requirements
- Technology Discussion
 - Commercial Controls
 - 100% solids and WB UV
 - WB 1K Urethane and Urethane/Acrylic Hybrids,
 - WB 2K OH Functional Acrylics
 - WB 1K Self Crosslinking Acrylics
 - WB 1K Blends
 - Carbodiimide Crosslinking
- Conclusions

KCMA

- An Acronym for the Kitchen Cabinet Manufacturer's Association
- KCMA sponsors a nationally recognized voluntary testing and certification program for kitchen cabinets
- KCMA designates cabinet construction as well as cabinet structural integrity
- Testing includes the ability of the finish to withstand chemicals simulating years of household abuse
- Testing also includes the ability of a finish to withstand detergent and water solution

KCMA Formula and Panel Preparation

- Clear Gloss Formulas
- Wood Panels lightly sanded with 220 grit sandpaper before coatings are applied
- Cherry Veneer panels for stain resistance testing
- Solid Oak for detergent edge soak test
- Spray 2 coats, approximately 4mils wet/coat
- Allow 1st coat to dry 1-2 hours; sand lightly with 220 grit sandpaper, then apply the 2nd coat
- Allow panels to dry for 7-10 days at ambient conditions before testing
- [ANSI/KCMA 161.1-2000\(R2005\), Section 9.3 for chemicals/stain resistances; Section 9.4 for detergent and water resistance](#)

ANSI/KCMA 161.1-2000(R2005), Section 9.3 for chemicals/stain resistances

- Procedure: With the face of the cabinet door standing vertically, pour 3 cc of each test material on the surface and allow to stand for 24 hours (mustard only 1 hour). Rinse the door with water and a sponge. There shall be no appreciable stain, discoloration or whitening to constitute a pass. If there is a failure, the panel may be re-examined for up to 14 days for recovery.
- Household Chemicals tested:
 - Vinegar
 - Lemon Juice
 - Orange Juice
 - Grape Juice
 - Ketchup
 - Coffee
 - Olive Oil
 - 100 Proof Alcohol
 - Detergent Solution
 - Mustard

Mustard Staining



ANSI/KCMA 161.1-2000(R2005), Section 9.4 for detergent edge soak

- Procedure:
 - Place the door vertically on a sponge which is in a one-half percent solution of detergent (example - Palmolive green) and water. Leave for 24 hours.
 - Remove door rinse and examine.
 - There shall be no evidence of blistering or delamination of the finish. In addition, there shall be no whitening, discoloration, checking, or other film failure.
 - In the event of one of the above failures, it is permissible to re-examine up to 14 days for recovery.

Detergent Edge Soak Test



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- **Mustard and Detergent Edge Soak results!!**

Commercial Controls

- The Names are changed to protect the innocence!

Commercial Controls- Pre Catalyzed Lacquers

| | KCMA Mustard | KCMA Detergent Edge Soak |
|------|-----------------|-----------------------------|
| WB 1 | P(14) | P |
| WB 2 | P(14) | P(1) |
| WB 3 | P(7) | P(1) |
| SB 1 | P | P |
| SB 2 | P | P(7) |

F: Fail

P: Pass

(): Days to recover and Pass

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100% Solids UV

| | Description | KCMA Mustard | KCMA Detergent Edge Soak |
|-----------------|-----------------------------|-----------------|-----------------------------|
| NeoRad P-10 | Aromatic PE | P | P |
| NeoRad U41/P-10 | Aliphatic UA | P | P |
| Neorad U-6281 | Aliphatic UA, easy matte | F | P |

F: Fail

P: Pass

(): Days to recover and Pass

WB UV

| | Description | KCMA Mustard | KCMA Detergent Edge Soak |
|---------------------------------|------------------------------------|--------------|--------------------------|
| NeoRad R-441 | Aliphatic U/acrylic functional, SF | F | P(1) |
| NeoRad R441/NeoCryl A633, 70/30 | A-633, Acrylic Copolymer, 1K | P | P(1) |
| NeoRad R-452 | Aliphatic U/A | P | P(1) |
| NeoRad UV-14 | Aliphatic Urethane, SF | F | P(1) |
| NeoRad UV-20 | Epoxy modified U/A | F | P(1) |

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WB Urethane and Urethane-Acrylic Copolymers

| | Description | KCMA Mustard | KCMA Detergent Edge Soak |
|---------------|---------------------------------|-----------------|-----------------------------|
| NeoRez R-9637 | Aliphatic | F | F |
| NeoRez R-9679 | Aliphatic | P(7) | F |
| NeoRez R-2190 | Aliph, self XL | F | P(1) |
| NeoRez R-9029 | Aliph, Alkyd, Acrylic Tribid | P | P(1) |
| NeoPac E-129 | U/A nMP free | P(7) | P(7) |

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WB 2K Acrylics

| | Description | KCMA Mustard | KCMA Detergent Edge Soak |
|----------------|------------------------|--------------|--------------------------|
| NeoCryl XK-532 | Acrylic, OH functional | P | P |
| NeoCryl XK-555 | Acrylic, OH functional | P | P(1) |

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WB 1K Acrylics

| | Description | KCMA Mustard | KCMA Detergent Edge Soak |
|----------------|----------------------------|--------------|--------------------------|
| NeoCryl A-6015 | Acrylic, adhesion promoted | P | P(1) |
| NeoCryl XK-12 | SXL Acrylic | P | P(1) |
| NeoCryl XK-14 | SXL Acrylic | P | P(7) |
| NeoCryl XK-17 | SXL Acrylic | P | P(7) |
| NeoCryl XK-18 | SXL Acrylic | P | P(7) |

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WB 1K Blends

| | KCMA Mustard | KCMA Detergent Edge Soak |
|--------------------|-----------------|-----------------------------|
| NeoCryl XK-12 | P | P(1) |
| NeoRez R-9637 | F | F |
| NeoRez R-9679 | P(7) | F |
| R9637/XK-12(70/30) | P(14) | P(1) |
| R9637/XK-12(30/70) | P(7) | P(1) |
| R9679/XK-12(30/70) | P(3) | P(1) |

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- **Carbodiimide Crosslinking**

Crosslinked Systems with Carbodiimide

| | KCMA Mustard Crosslinked | KCMA Detergent Edge Soak Crosslinked | KCMA Mustard Uncrosslinked | KCMA Detergent Edge Soak Uncrosslinked |
|---------------|--------------------------------|--|----------------------------------|--|
| NeoCryl XK-12 | P | P | P | P(1) |
| NeoPac E-129 | P(2) | P | P(7) | P(7) |
| Neorez R-2190 | F | P | F | P(1) |
| Neorez R-9637 | P(14) | P(2) | F | F |
| | | | | |

F: Fail

P: Pass

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Final Conclusions (and thoughts?)

- There are many alternate choices in compliant technologies which meet KCMA requirements:
- 100% UV and WB UV
- New WB Tribrid polyurethanes and urethane-acrylics
- WB 1 K acrylics and new WB 2K acrylics
- Technologies can be blended and crosslinked for further performance improvements

Thank you to...

- Tom Stolki



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