



# Superdurable One-Shot Matte Polyester HAA Powder Coatings

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# Agenda

- The LOSS of GLOSS – growing interest in (dead) matte powder coatings
- Common options for gloss reduction, and the challenges they bring
- New technology – new benefits
  - Characteristics
  - Gloss stability
  - Accelerated and natural weathering
  - Chemical resistance

# Why (dead) matte powder coatings?

- Matte and dead matte (<10 GU) finishes differentiate and portray luxury
- Bring all the benefits of powder coatings + a fresh look
- Harmonization with similar liquid coatings

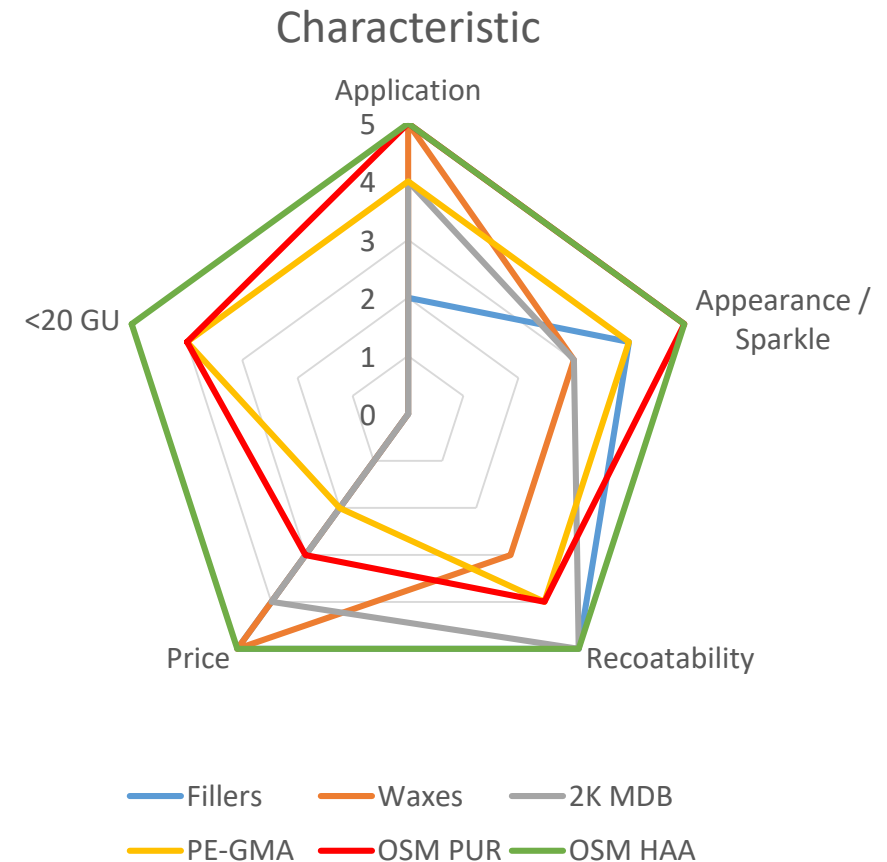


# Gloss reduction in polyester powder coatings

1. Fillers ( $\text{CaCO}_3$ ,  $\text{BaSO}_4$ , ATH)
  2. (reactive) matting waxes
  3. 2 component dry blend (2K MDB)
  4. Polyester-GMA acrylic hybrid
  5. One-shot matte (OSM) polyurethane (PUR)
1. High specific gravity (S.G.) can cause poor application; gloss reduction limited to ~30-40 GU
  2. Hazy appearance in dark colors and poor recoatability; gloss reduction limited to ~30-40 GU
  3. Manufacturing complexity; sparkle appearance; gloss reduction limited to ~30-40 GU
  4. High price; contamination concerns
  5. Higher price; mostly limited to <10 GU

# One-shot matte (OSM) Polyester HAA

- Co-extrusion of 2 carboxyl polyesters cured with HAA ( $\beta$ -Hydroxyalkylamide)
  - High filler levels NOT required –  
↓ S.G. ✓
  - No surface haze or recoatability issues ✓
  - One-shot process with no sparkle ✓
  - Price competitive ✓
  - Gloss levels <20 GU; <5 GU also possible ✓



# Gloss achieved with OSM Polyester HAA

Material	Formula 1	Formula 2	Formula 3	Formula 4
Resin A <sup>1</sup>	308.6	303.9	453.6	444.2
Resin B <sup>2</sup>	308.6	303.9	453.6	444.2
HAA	39.3	38.7	57.8	56.6
TiO <sub>2</sub>	330	320	-	-
Carbon black	-	-	15	15
Flow aid	10	10	15	15
Degassing agent	3.5	3.5	5	5
Additive <sup>3</sup>	-	20	-	20
<b>Total</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>
<b>Gloss (20°/60°)</b>	2 / 13	1 / 3	4 / 20	<1 / 3



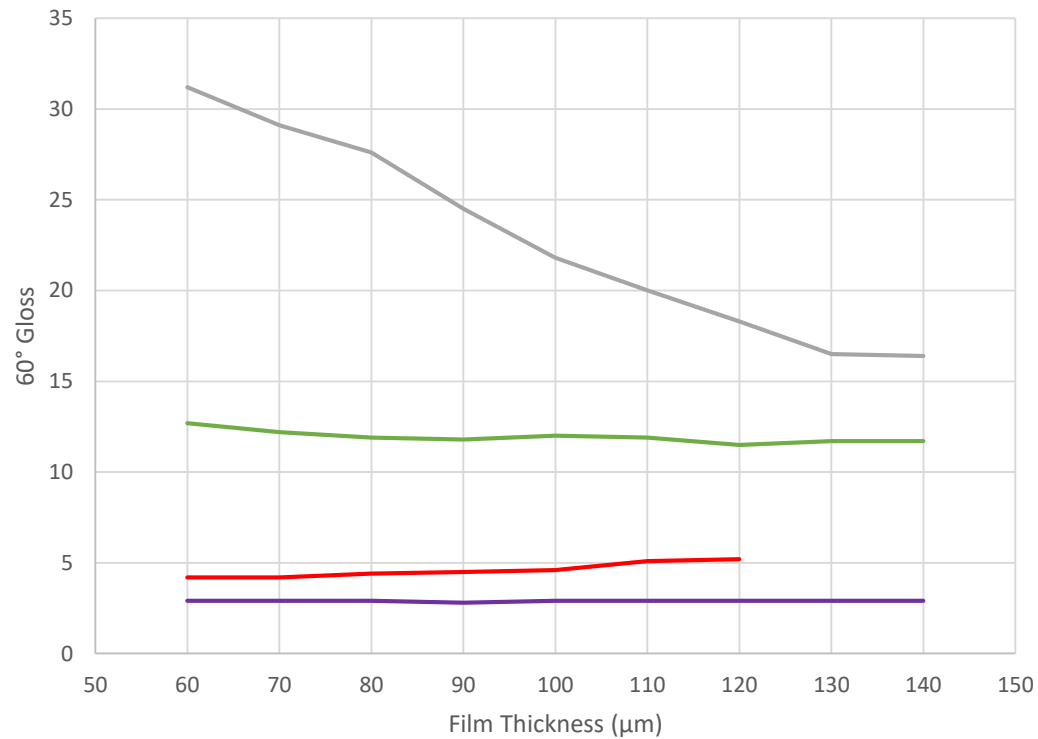
<sup>1</sup>AV ~64; viscosity ~35 Pa·s; Tg ~66°C

<sup>2</sup>AV ~20; viscosity ~42 Pa·s; Tg ~63°C

<sup>3</sup>Silicon dioxide (amorphous), methylated

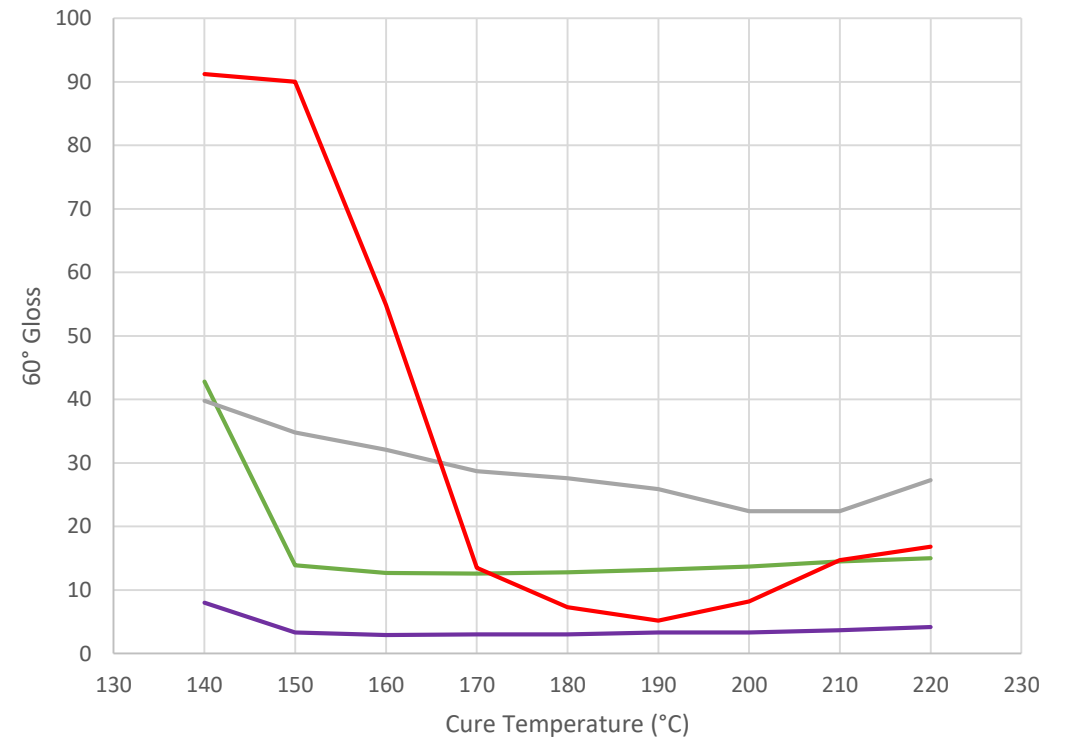
# Gloss stability with OSM Polyester HAA

Gloss Stability vs. Film Thickness



\*in white formulation — OSM HAA — OSM HAA w/ Additive — 2K MDB — OSM PUR

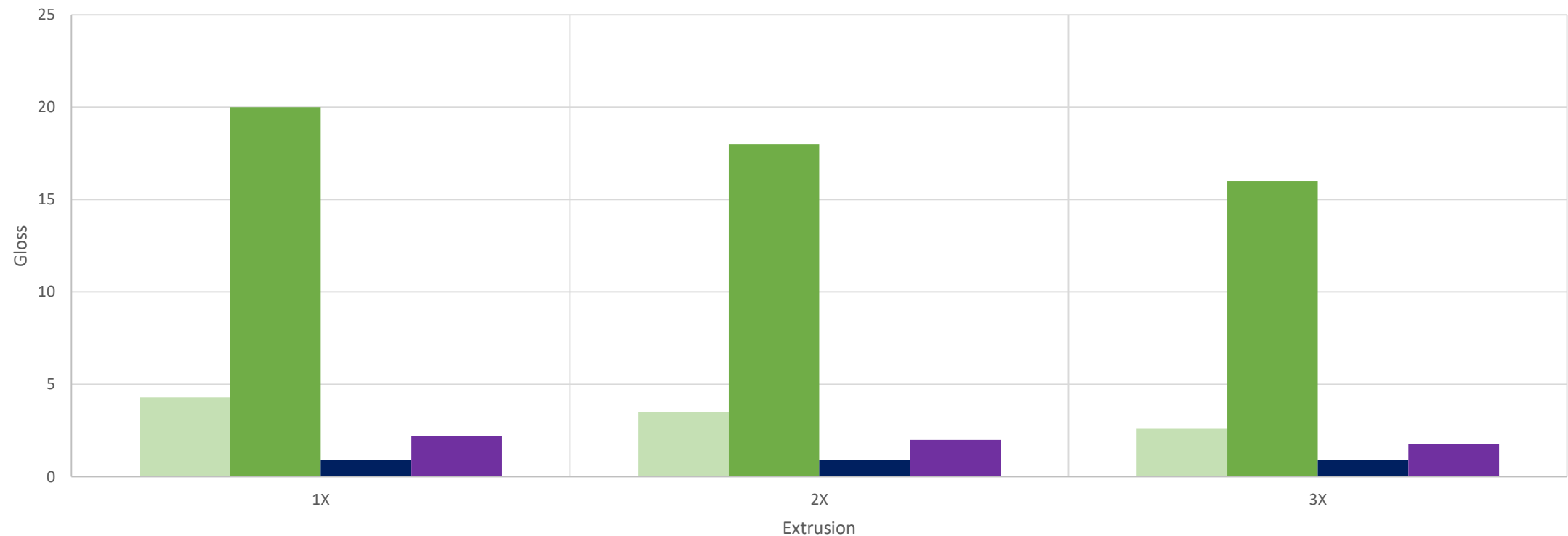
Gloss Stability vs. Cure Temperature



— OSM HAA — OSM HAA w/ Additive — 2K MDB — OSM PUR

# Gloss stability with OSM Polyester HAA

Gloss Stability vs. Extrusion

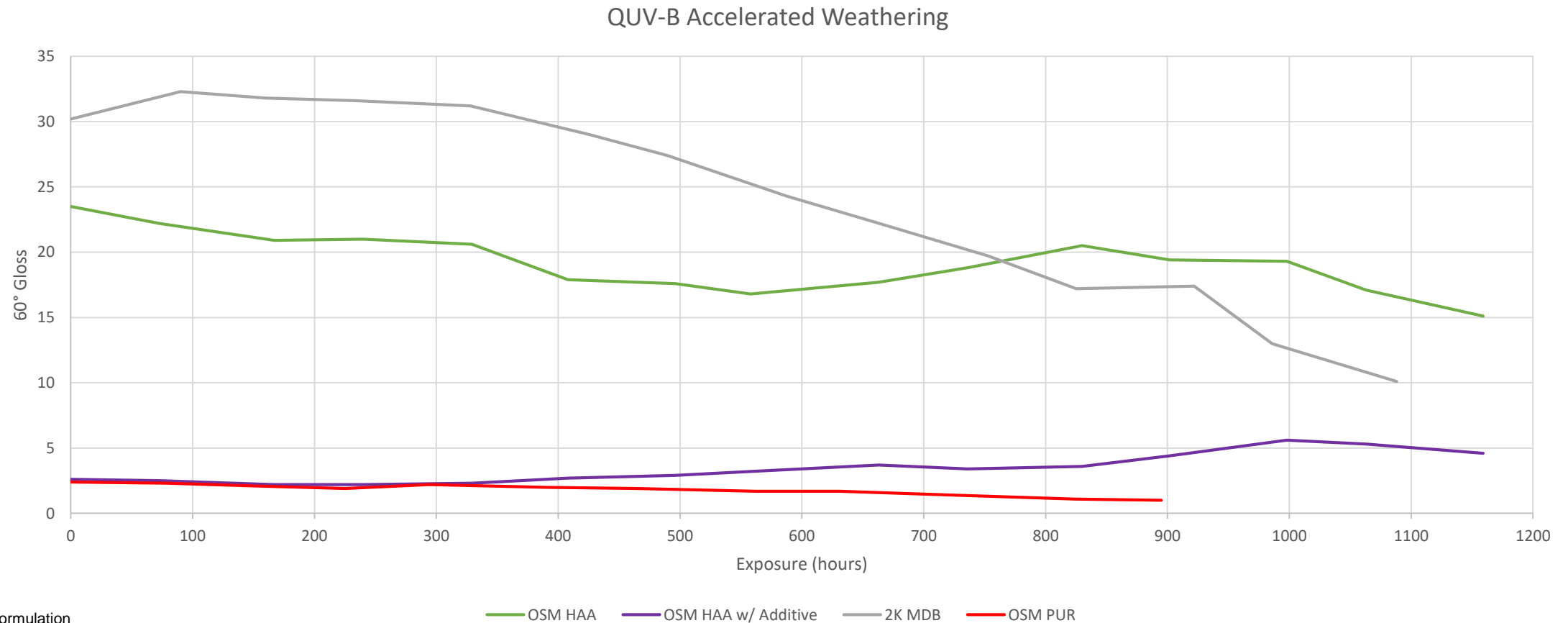


\*in black formulation

OSM HAA - 20° OSM HAA - 60° OSM HAA w/ Additive - 20° OSM HAA w/ Additive - 60°



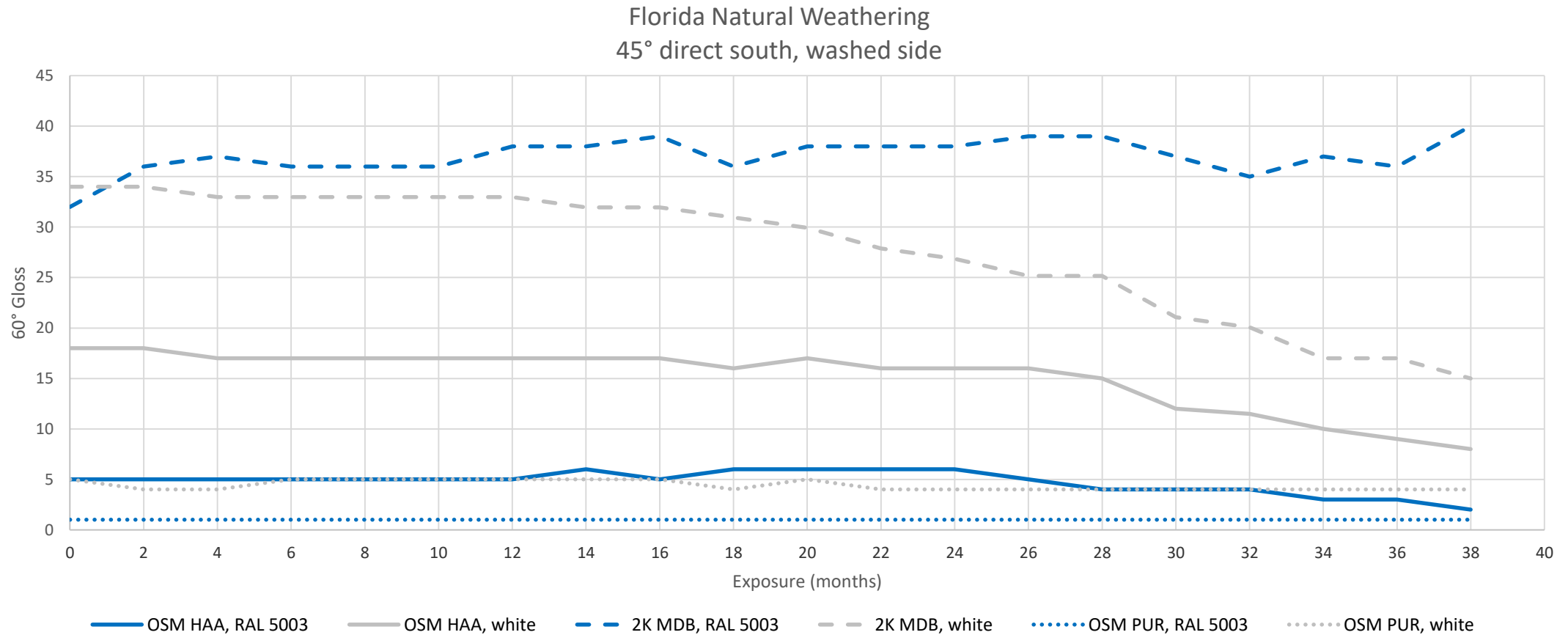
# OSM Polyester HAA accelerated weathering



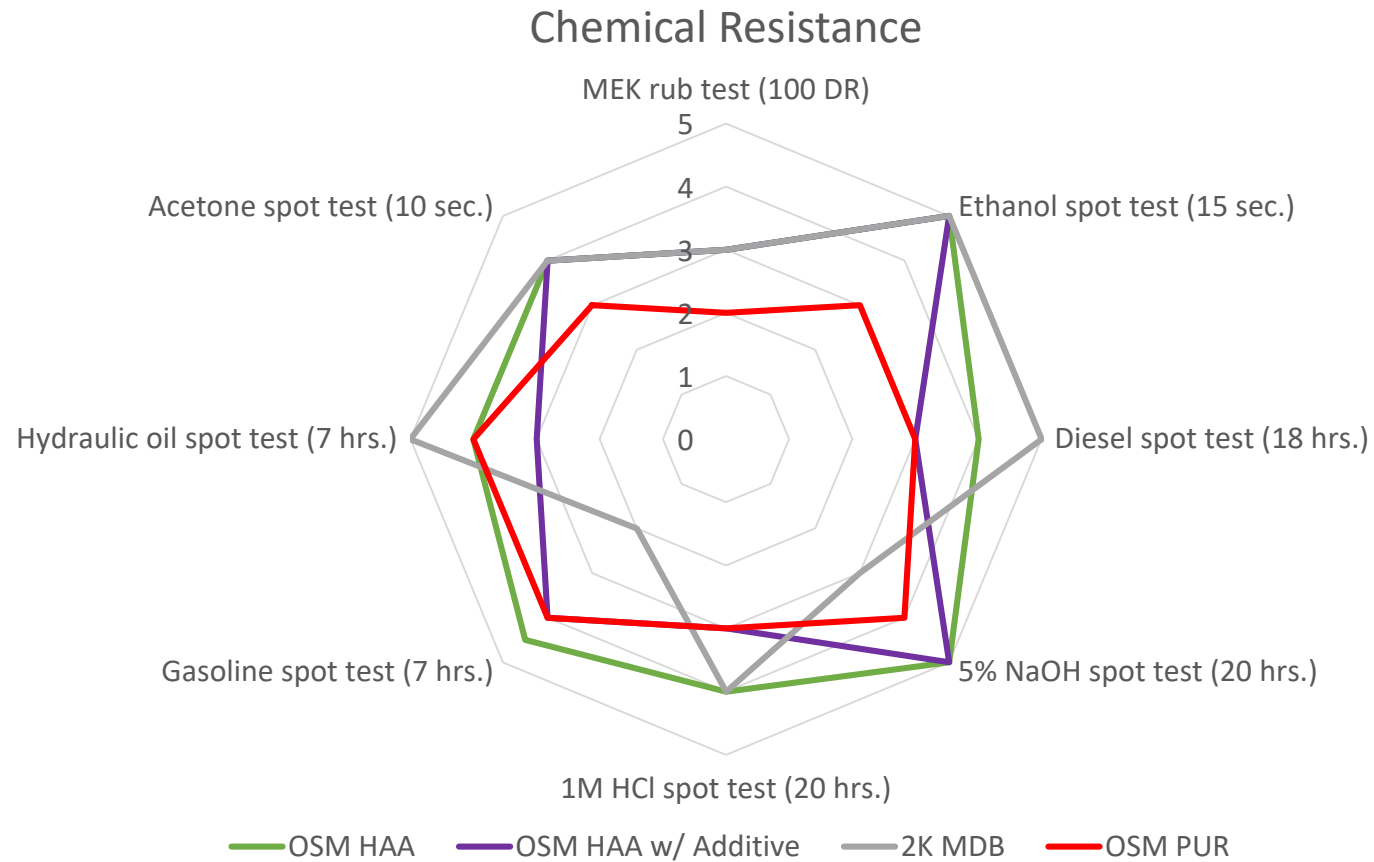
\*in black formulation

— OSM HAA — OSM HAA w/ Additive — 2K MDB — OSM PUR

# OSM Polyester HAA Florida weathering



# OSM Polyester HAA chemical resistance



\*(5 = ok, 0 = heavily attacked)

# Summary

Superdurable one-shot matte (OSM) HAA system developed, with improved:

- Gloss reduction – <20 GU (<5 GU with silica additive)
- Gloss stability – film thickness / cure temperature / extrusion
- Application – ↓S.G. of formula
- Appearance – No sparkle
- Formula cost – co-extrusion; No acrylic / isocyanate

... and comparable

- Weathering resistance
- Chemical resistance

# Questions?

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