

Durable White Masterbatch

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About Ingenia

- 1986 Incorporated under the name Wed Tech Inc.
- Brantford plant start-up.
- 1990 Start-up of Calgary, Alberta Plant
- 1993 Began manufacturing of Proprietary Masterbatches
- 1998 Wedco buyout, renamed Ingenia Polymers Corp.
- 1999 Start-up of Houston, Texas Plant
- 2002 Opened Mexico Sales Office / Service Center
- 2007 Opened KSA office
- 2008 Start-up of Black Compound plant – Texas
- 2012 Start-up of plant in Al-Jubail, Saudi Arabia
- 2013 Opened Mumbai and Dubai Offices

Our Presence



Plants & Products

Plant locations

Canada (Brantford & Clagary)

USA (Houston)

Saudi Arabia (Al Jubail).

Product types

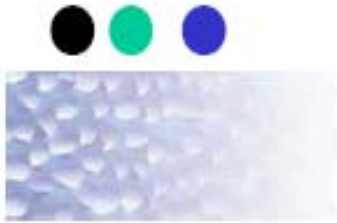
Superblend[®] additive concentrates for Resin Producers

Masterbatch for packaging industry

Compounds and grinding for Rotomolding

Plant Capacity

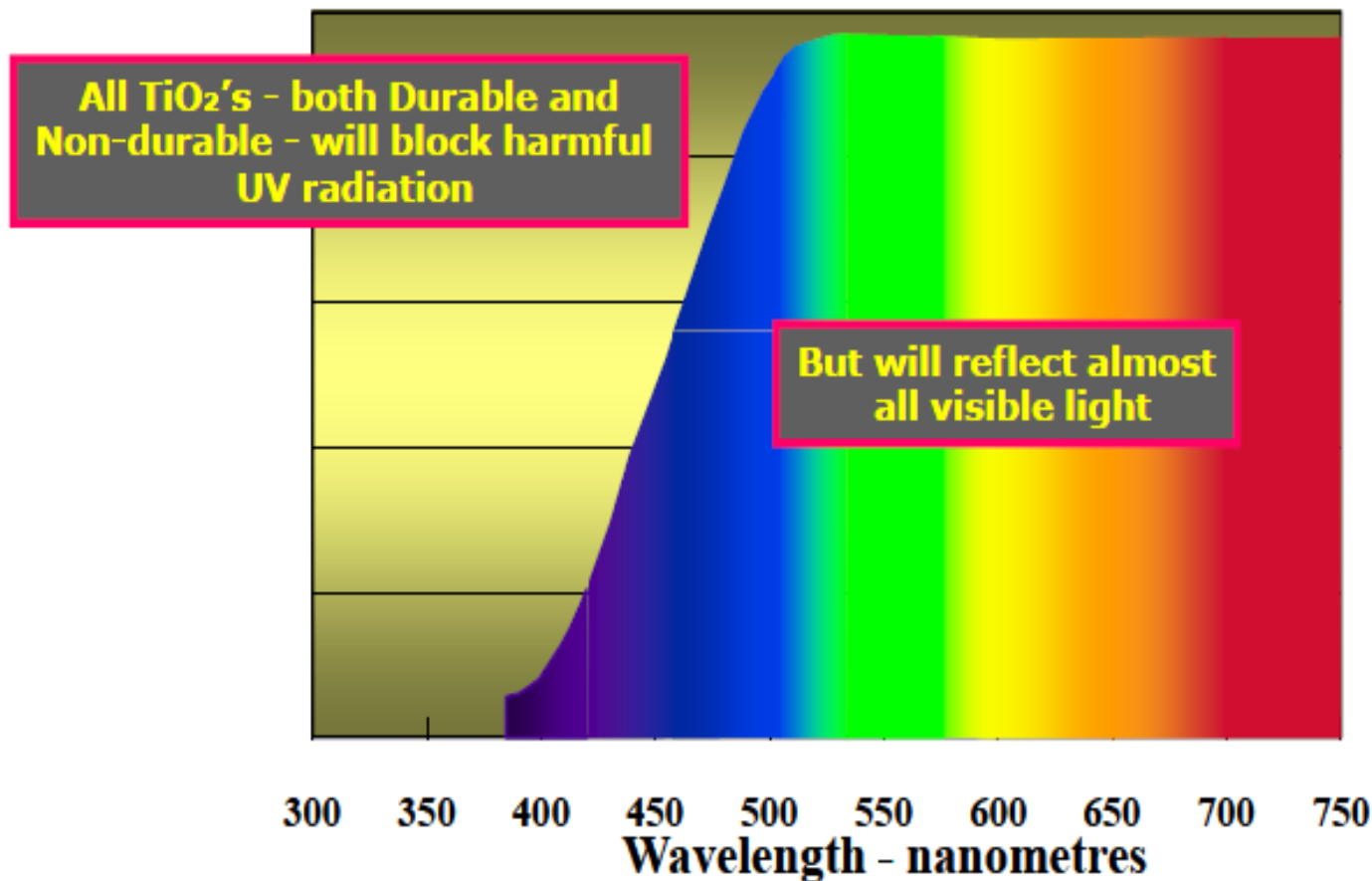
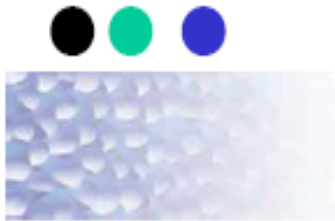
| Process | Brantford Canada | Calgary Canada | Houston, USA | Jubail, Saudi Arabia |
|--------------------|---------------------|-----------------------|---|-------------------------|
| Extrusion | 29 KTA | 26 KTA | 40 KTA <u>22 KTA</u> <u>Black</u> 62 KTA | 37 KTA |
| Grinding | 16 KTA | 14 KTA | 9 KTA | 11 KTA |
| Superblends | | | | |
| Type B, D | 3 KTA | 0 | 0 | 9 KTA |
| Type C | <u>0</u> 3 KTA | <u>2 KTA</u> 2 KTA | <u>5 KTA</u> 5 KTA | <u>9 KTA</u> 18 KTA |



Durability

All TiO_2 particles will absorb UV radiation

Reflectance Curve for Rutile Titanium Dioxide

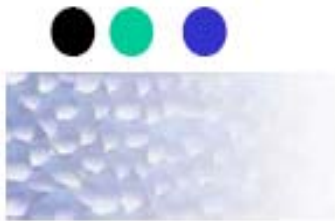




Durability

- But when TiO_2 particles absorb UV radiation they will become catalytically active
- This activity forms free radicals which reacts with polymers, and will cause them to degrade

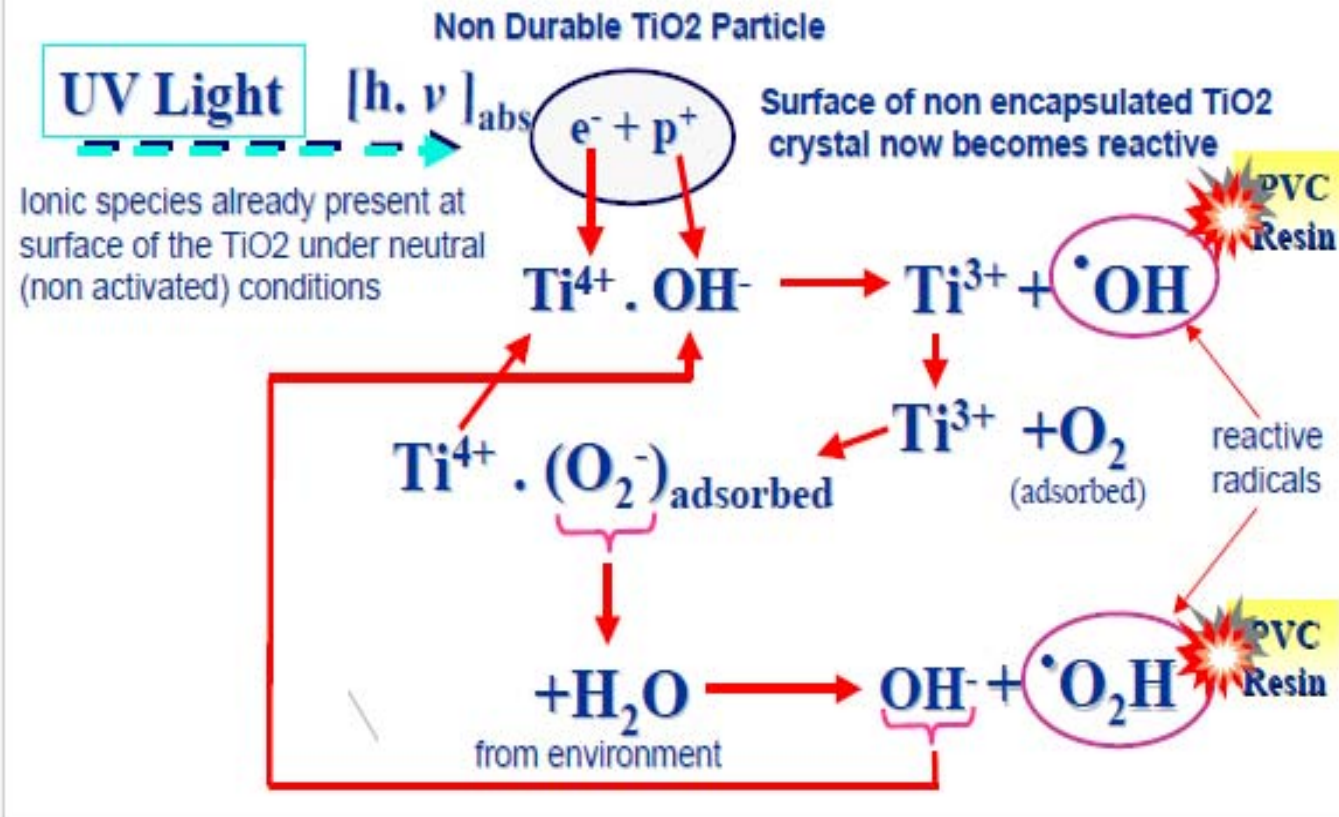
Weathering



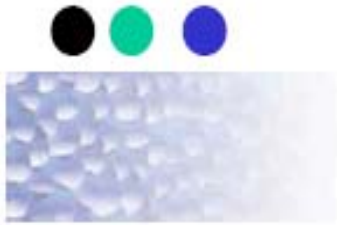
Possible Defects on Weathering:

- Chalking
- Loss of gloss
- Loss of strength
- Discoloration

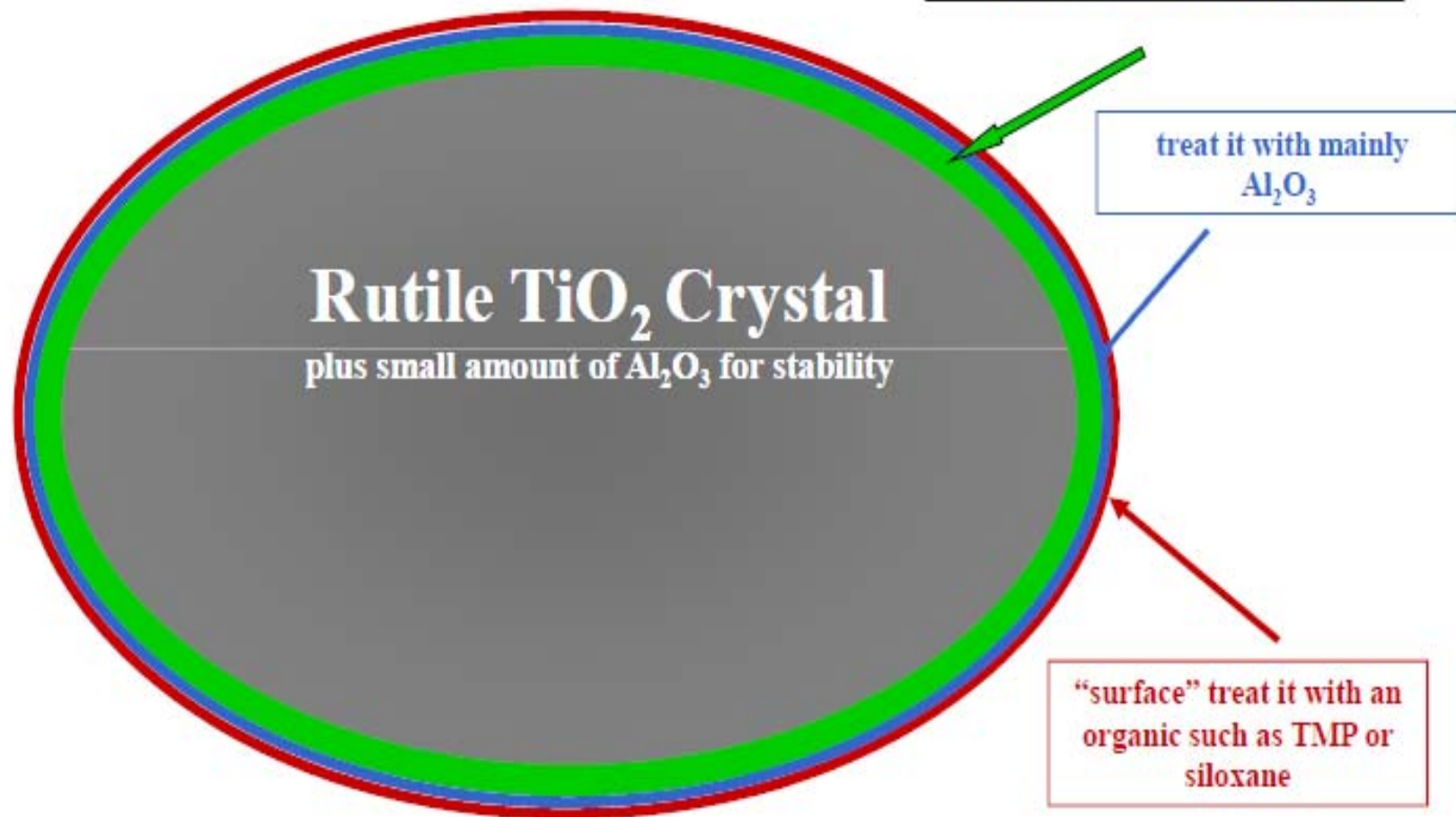
Photocatalytic Cycle with Oxygen (Oxidation - Favours "De-yellowing")

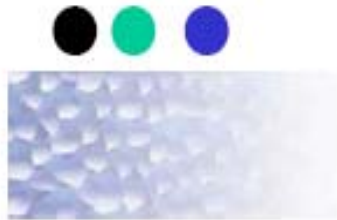


To minimise catalytic reactivity at surface of TiO_2 , particles are treated with inorganic silica.....



“surface” treat it with SiO_2 first





Durable Whites

- **Ingenia 1008 for film applications**
- **High performance in presence of UV**
- **Retention of physical properties**
- **Excellent color and gloss retention; resistance to yellowing, gas fading**
- **Low moisture/volatiles**
- **Excellent processability**



Ingenia 1008 → 70% Durable White

**How does IP 1006 perform versus
IP 1008 in UV applications?**



Weathering Tests

- **Film samples are placed in QUV Weathering Instrument or Xenon Arc Chamber**
- **UV light exposure followed by a condensation cycle**
- **ASTM G26 or G53**
- **Tensile strength of films are tested over period of time**

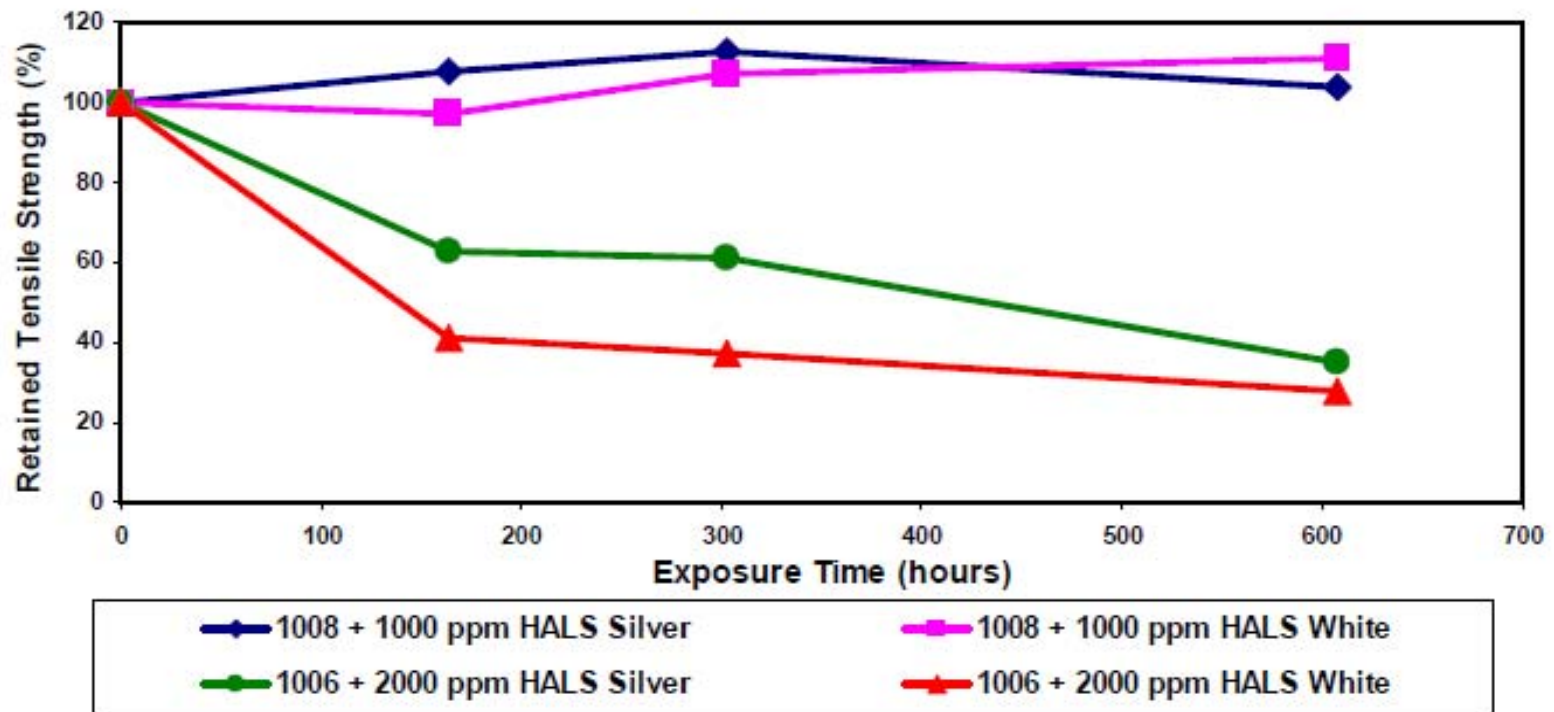


QUV Weathering Instrument



Ingenia 1006 vs 1008

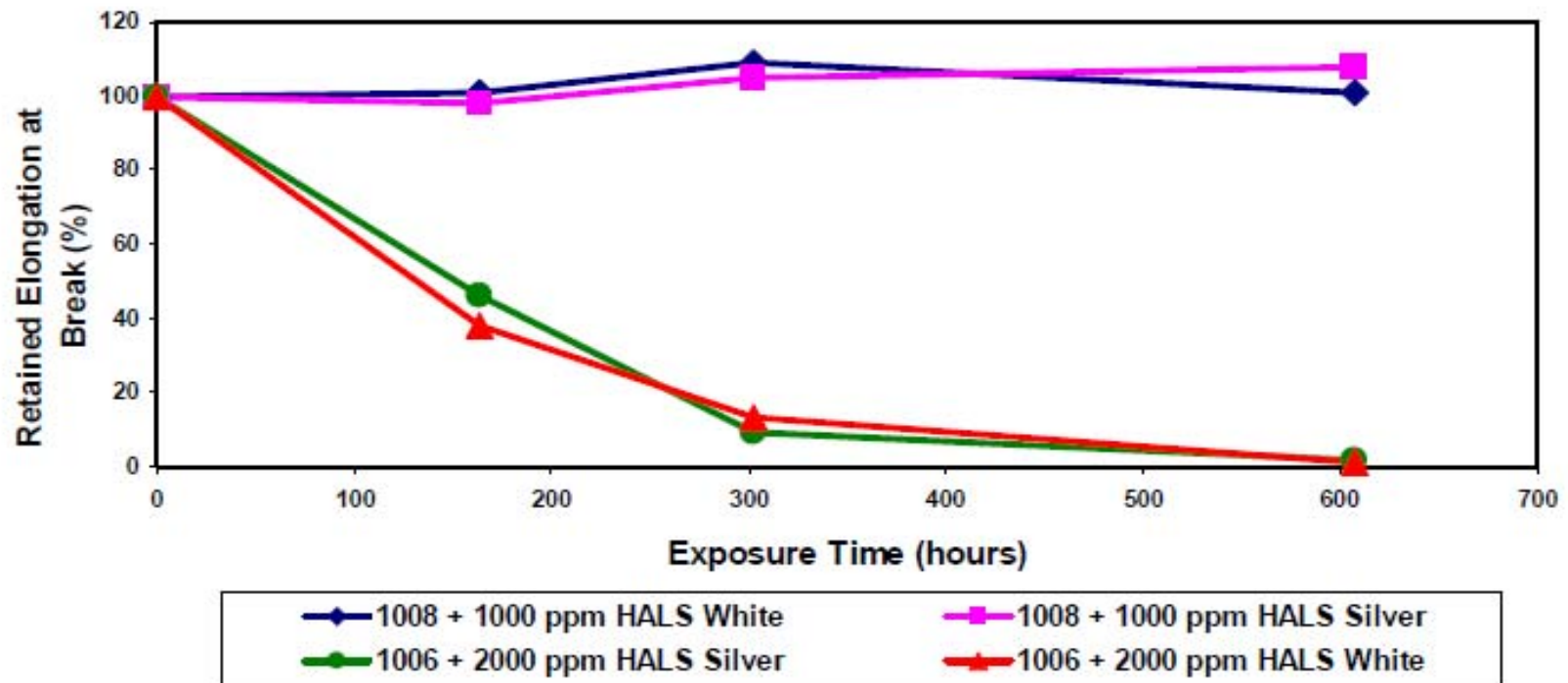
Xenon Arc Degradation ASTM G26





Ingenia 1006 vs 1008

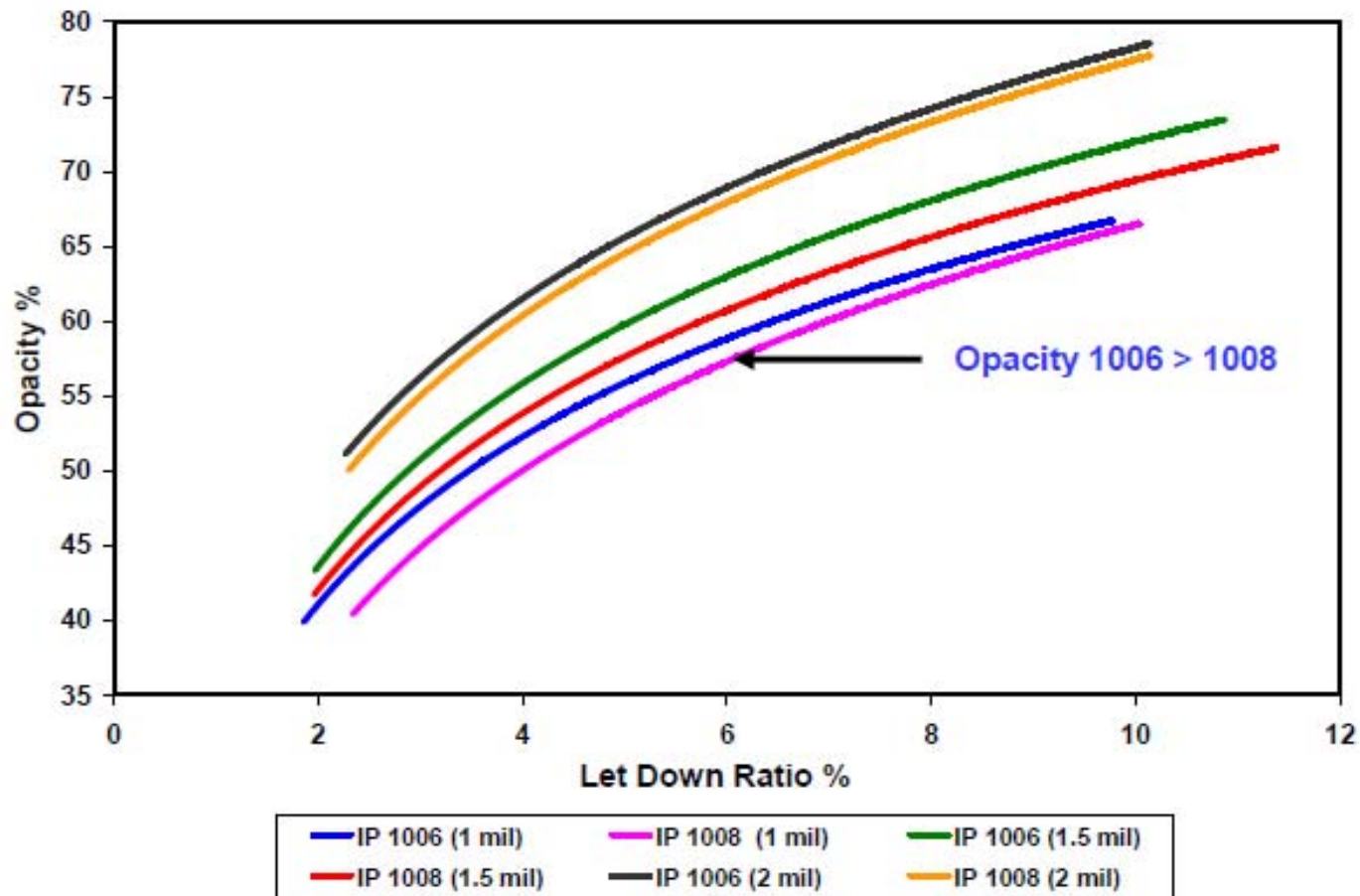
Xenon Arc Degradation ASTM G26





Ingenia 1006 vs 1008

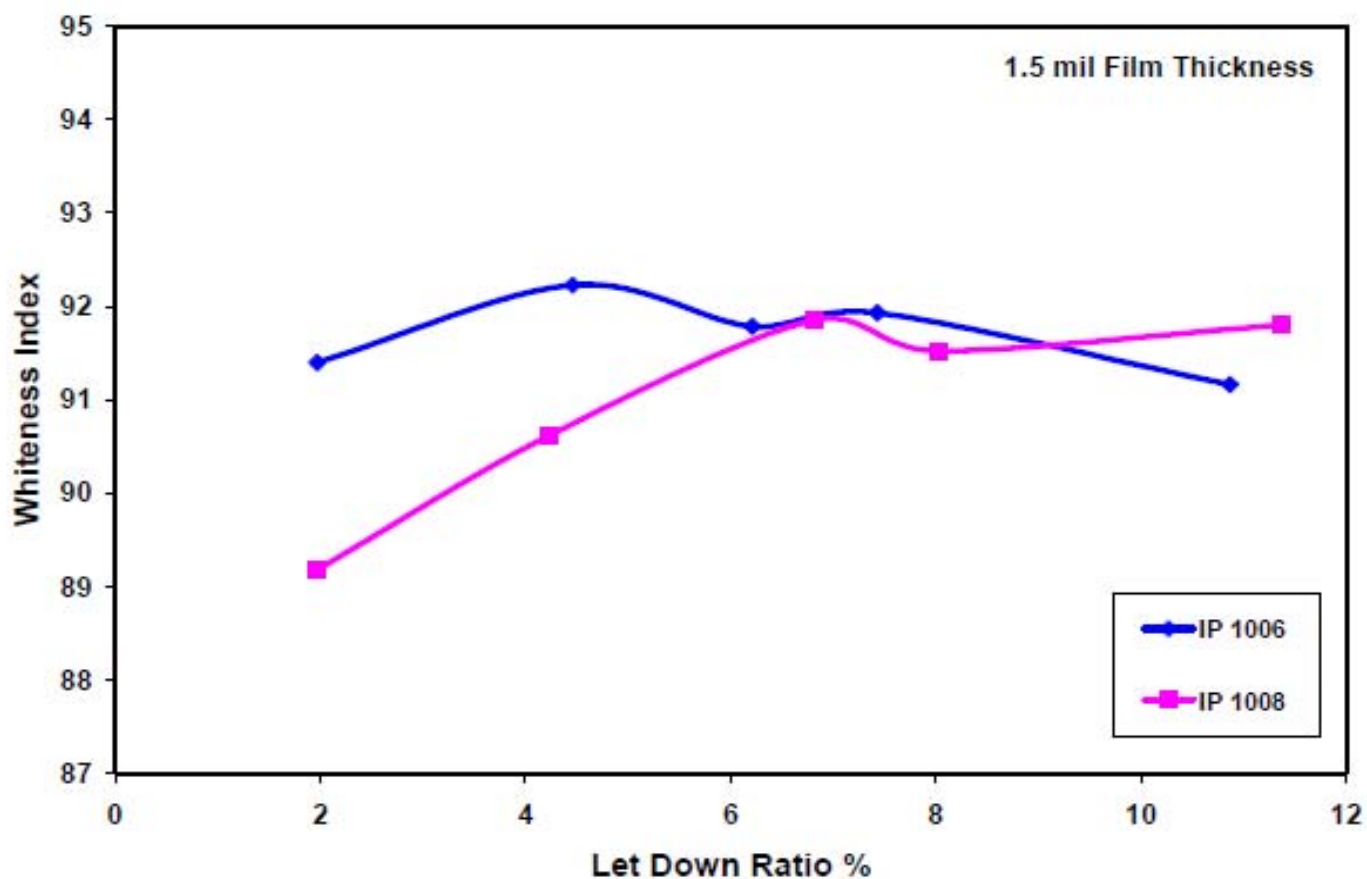
Blown Film of various thickness – Opacity Results





Ingenia 1006 vs 1008

Blown Film – Whiteness Index





Case Study 2

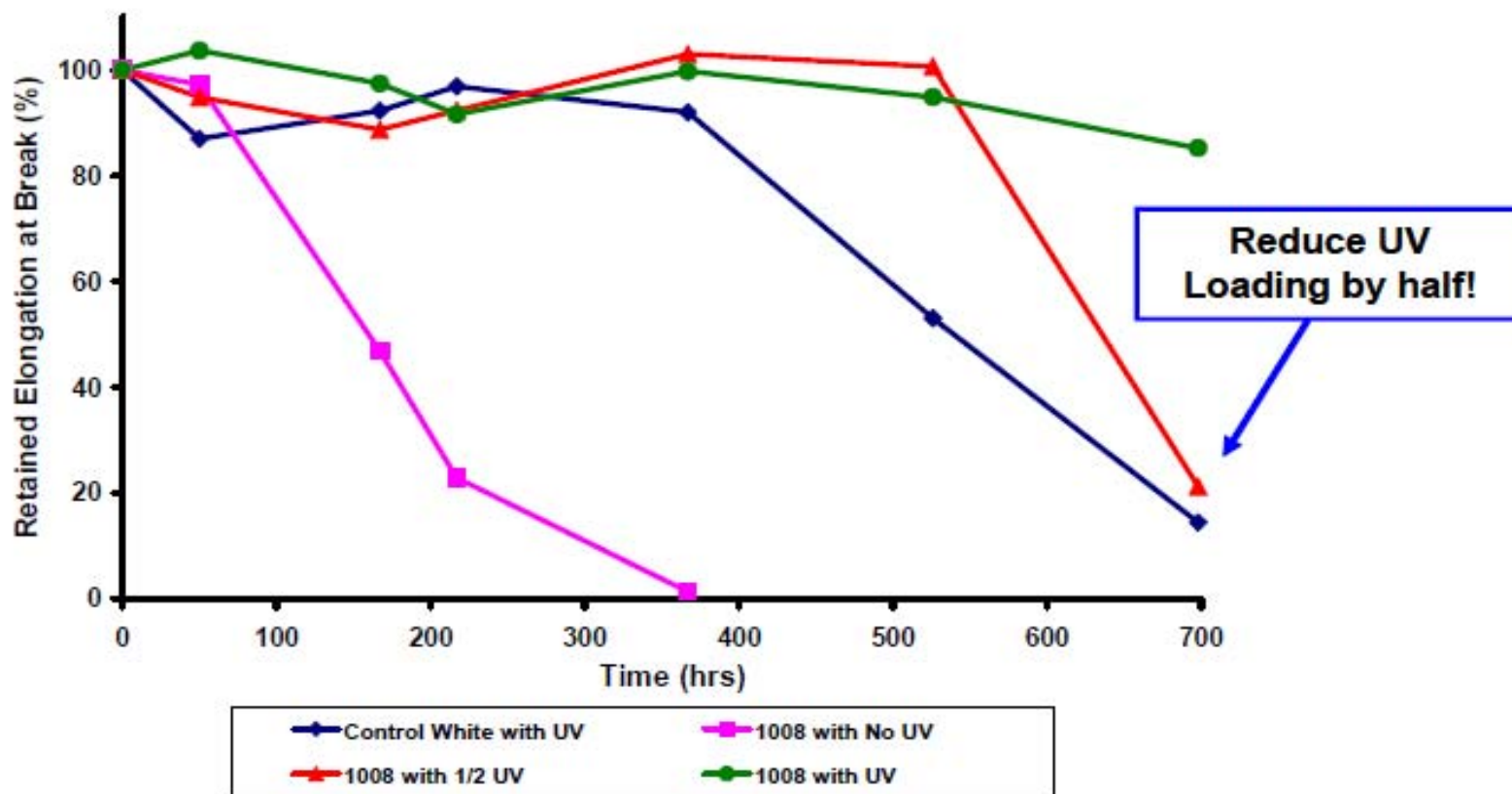
- **QUV Weathering Study**
- **Mulch Films**
- **Cycle comprised of 8 hrs of UV light exposure at 60°C (140°F) followed by 4 hrs condensation**

Film Samples

- **Control White (Competitor) with UV**
 - **IP 1008 with no UV in film**
 - **IP 1008 with ½ UV loading in Control White**
 - **IP 1008 with same UV loading as Control White**
-



Case Study 2 – Mulch Bags



QUV ASTM G53



Case Study 3

■ Xenon Arc Degradation Study

■ Silage Films

■ ASTM G26

■ Irradiance @340 nm, Black panel 63 C, Relative Humidity 35, Dark cycle, water spray

Film Samples

■ Control White – 2940 ppm UV HALS, 945 ppm AO

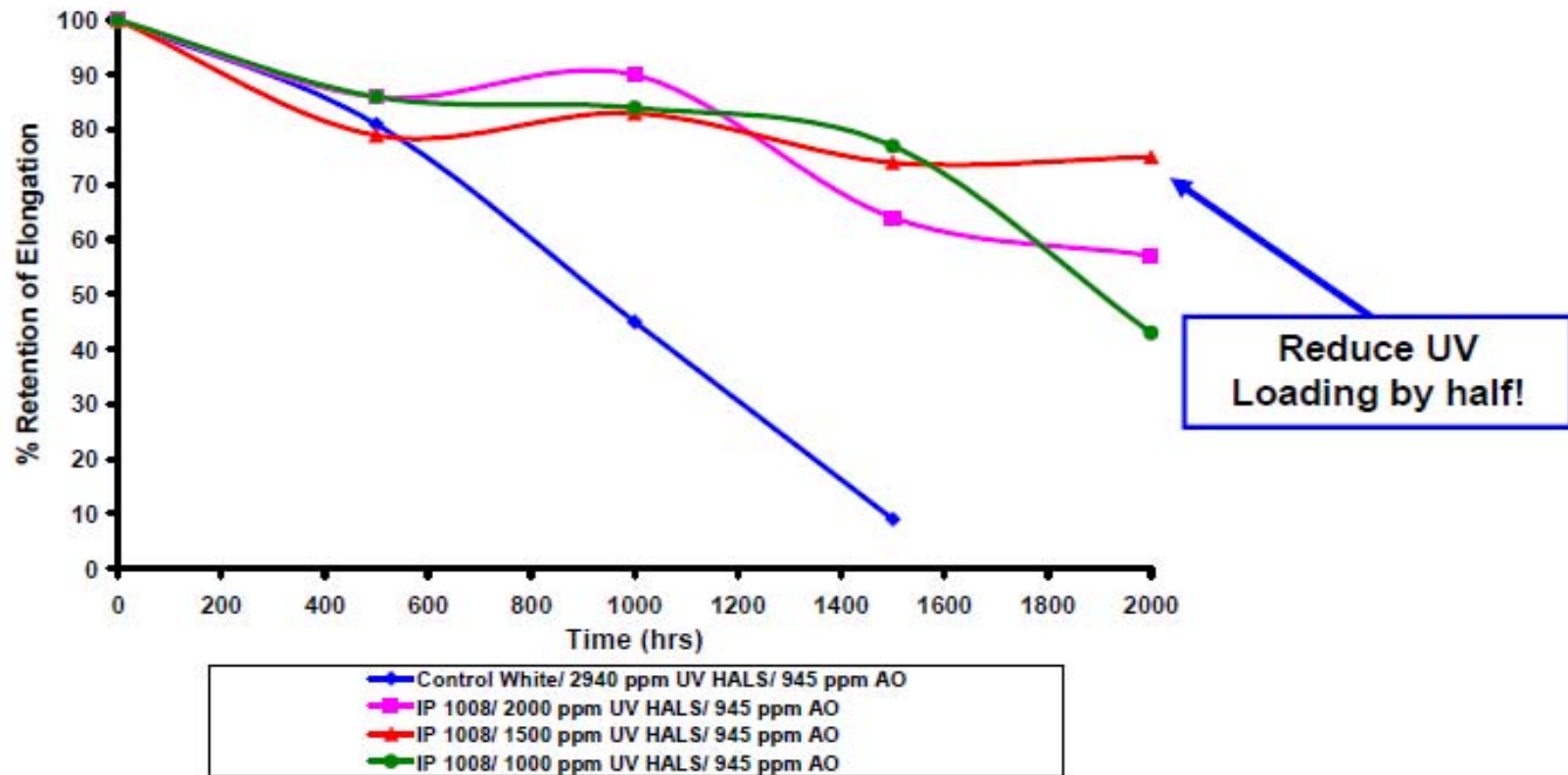
■ IP 1008 – 2000 ppm UV HALS, 945 ppm AO

■ IP 1008 – 1500 ppm UV HALS, 945 ppm AO

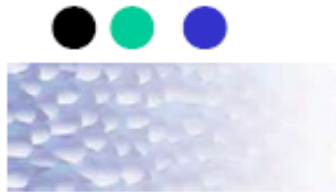
■ IP 1008 – 1000 ppm UV HALS, 945 ppm AO



Case Study 3 – Silage Films



Xenon Arc Degradation ASTM G26



Summary

- **Reduce UV loadings by half with IP 1008 and improve performance**
- **IP 1008 with UV outperforms IP 1006 White with UV**
- **IP 1008 can be used as an alternative to IP1006 for high UV exposure**



THANK YOU !

