## Capabilities

### Materials

<table>
<thead>
<tr>
<th>Mainstream</th>
<th>ABS &amp; HIPS varieties including <em>Alextra</em>™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weatherables</td>
<td>Centrex, Luran, Geloy, SolarKote</td>
</tr>
<tr>
<td>Flame retardant</td>
<td>FR ABS, FR ABS/PC, FR ABS HIPS, NORYL</td>
</tr>
<tr>
<td>Special purpose</td>
<td>High heat deflection, Chemical Resistance, Low Temperature Impact Strength, F.D.A. Compliance</td>
</tr>
</tbody>
</table>

### Size

<table>
<thead>
<tr>
<th>Width &amp; Length</th>
<th>Widths up to 100&quot; in any reasonable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge</td>
<td>.050 to .500 inch thickness</td>
</tr>
</tbody>
</table>

### Finishes

<table>
<thead>
<tr>
<th>Textures</th>
<th>Smooth, Deep Haircell, Light Haircell, Santex, Saddle, Moroccan, Duratex, Calf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss</td>
<td>All finishes are available in low or high gloss</td>
</tr>
<tr>
<td>Color</td>
<td>Custom colors can be matched with a variety of special effects</td>
</tr>
<tr>
<td>Co-extrusion</td>
<td>Two and three layer co-extruded sheet enable cost reduction and material reusability</td>
</tr>
<tr>
<td>Films</td>
<td>Decorative films are available for your custom application</td>
</tr>
<tr>
<td></td>
<td>Protective film is available for extra protection</td>
</tr>
</tbody>
</table>
Product Features

Utilizing SABIC’s new Weatherable Copolymer resin technology and the proven benefits of Lexan* resins to produce highly differentiated Co-Extruded sheet products

Alextra™ continues Allen’s history of providing industry-leading high-gloss, durable sheet. With the release of Alextra™, Allen raises the industry standard in aesthetics and durability for extreme weather conditions.

- High-gloss finish has almost mirror-like depth of image
- Excellent Weatherable Performance and Property Retention
- Sheet available in high-gloss and textured surface finishes
- Multiple substrates offer a variety of custom sheet systems
- Heat deflection temperatures exceeding 275°F
- High impact properties are sustainable over an extended temperature range (Currently tested to -76°F)
- High flexural modulus, low thermal expansion, good chemical and mar resistance
- Excellent forming characteristics and regrind compatibility

Alextra™ is available in three grades.
- MV - Most Versatile
- TS - Thermally Stable
- ET - Extreme Temperature

http://www.allenx.com/alextra.asp

* Trademarks of SABIC
Design Space

Cap Layer Grade: (0.25-0.5mm)
- Lexan SLX 1432 – Opaque

Color Space:
- High-Chroma Solids
- Non-Whites (<75 on DL*)
- Non-Metallics

Surface Appearance:
- High Gloss 100-110 at 60D
- Texture – Extrusion Rolls

Scratch Resistance:
- Improved over PCs and TPOs

Weathering: (Customer Defined)
- Accelerated test of LEXAN SLX1432 resin
- Color & Property retention
- Up to 5 years – Color dependent

Products

Lexan* SLX1432/ Cycoloy* MC8100 Resins – MV
- High Impact (N.I. 10ft-lb/in, 49kJ/m2)
- Can Replace ABS Systems

Lexan SLX1432/ Cycoloy CE1820 Resins - TS
- High Heat (HDT, 280F, 138C)
- High Flex Modulus (430ksi, 2965MPa)

Lexan SLX1432/ Lexan EXL1330 Resin – ET
- Chemical Resistance
- Long-term property retention

* Trademarks of SABIC
Utilizing SABIC's new Weatherable Copolymer resin technology and the proven benefits of Lexan* resins to produce highly differentiated Co-Extruded sheet products

Product Design
- Excellent Weatherable Performance and Property Retention
- Most Versatile and Best Economics in Product Line

Key Characteristics
- High Impact, N.I. 8ft-lb/in@-22, 38kJ/m2@-30C
- High HDT, 255F/124C
- Improved Performance over ABS

Segment Opportunities
- Industrial
- Heavy Truck
- Recreational Vehicles
- Auto After-Market
- Agriculture / Construction

http://www.allenx.com/alextra-mv.asp
Utilizing SABIC’s new Weatherable Copolymer resin technology and the proven benefits of Lexan* resins to produce highly differentiated Co-Extruded sheet products

**Product Design**
- Excellent Weatherable Performance and Property Retention
- Thermally Stable, High Stiffness

**Key Characteristics**
- Low CTE, Near FRP
- High Temperature
- High Modulus, 430kpsi/2965MPa
- High HDT, 280F/138C
- Dimensionally Stable
- Good Cold Temperature Impact

**Segment Opportunities**
- Auto After-Market
- Heavy Truck / Bus
- Marine
- Recreational Vehicles
- Heavy Equipment


* Trademarks of SABIC
ET – Extreme Temperature

Utilizing SABIC’s new Weatherable Copolymer resin technology and the proven benefits of Lexan* resins to produce highly differentiated Co-Extruded sheet products

Product Design
- Excellent Weatherable Performance and Property Retention
- Extreme Temperature

Key Characteristics
- Low Temperature Impact to -60C
- Chemical Resistant
- Physical Property Retention
- Low Coefficient of Friction
- High HDT, 275F/135C
- Bondable

Segment Opportunities
- Industrial
- Heavy Truck / Bus
- Marine
- Recreational Vehicles
- Personal Recreation
- Agriculture / Construction

http://www.allenx.com/alextra-et.asp

* Trademarks of SABIC
System Attributes - Quick Facts

- Caps Gloss: 100-105 @ 60D – Similar to Paint
- Cap resin is Paintable
- Cap Resin Resists Stress Whitening
- Cap Higher Surface Hardness vs. TPO
- Average Cap Thickness: 0.25 - 0.5mm
- Cap Opacity: Recommend Custom Colored Substrate
- Formable Protective Masking Available: Smooth Sheet Designs
- Easily Trimmed and Machined to Close Tolerances
- Reclaimable: Up to 30% Regrind in Substrate – “No” Effect
- Co-Extrusion Process: “No” Special Equipment Needs
- Sheet Drying Required (See “Sheet Drying Guidelines”)

* Trademarks of SABIC
### Case Study: Bus Application with **ALEXTRA™ ET**

**Application:** Bus Rocker Panels  
**Resins in Sheet:** Lexan SLX and Lexan EXL  

**Customer CTQ’s**  
- Lower System Cost vs. Min. Filled TPO  
- Solid Color (Gray) Through Sheet’s Thickness  
- Textured Surface  
- Low Temp. Impact, –40°C  
- Thermoforming Process Capable  
- Paintable/ Bondable/ Repairable  
- UV Resistance - (3) Years  
- Abrasion Resistance  
- Chemical Resistant (road and engine mat’ls)  
- Must meet MVSS 302  
- 12-15 Year Service Life

**System’s Value Proposition vs. Min. Filled TPO**  
- Lower Systems Cost (up to 20% Scrap Reduction)  
- Part Consistency  
- Paintable and Bondable  
- Weatherable – 3yr. Color/Gloss Retention  
- Lower CTE  
- Higher Scratch Resistance  
- Texture Replication (Santex)  
- Faster Molding Cycle (40% Cycle Reduction)  
- Low Temp. Ductility -40°C

**Project Results:**  
**Bus OEM**  
- Able to Meet –40°C Impact Requirement  
- Achieved Texture Specified  
- Improved Assembly Process  
- Created Greater Product Differentiation  

**Converter (Thermoformer)**  
- Reduce Scrap Rate to <3%  
- Enabled 40% Cycle-Time Reduction  
- Improved Part Consistency  
- Expanded ETP Sheet Processing Capability

---

**Bus Validation… High Translatability**
**Sheet Processing Guidelines for ALEXTRA™ TS**

---

### TERMOFORMING EVALUATION - DATA SUMMARY

<table>
<thead>
<tr>
<th>Material</th>
<th>Cycoloy* CE1820</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.180 in / 4.5 mm</td>
</tr>
<tr>
<td>Sheet Size Tested</td>
<td>26 x 31 in / 660 x 787 mm</td>
</tr>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
</tbody>
</table>

### SAG PERFORMANCE

Melt Strength (Sag Rate @ Set Heater Density)

| 10in/2.5min @ 15W/in² | 254mm/2.5min @ 2.3W/cm² |

### SUGGESTED THERMOFORMING CONDITIONS

| Drying Temperature        | 180 - 230° F / 110 - 120° C |
| Drying Time               | 8 - 24 hours |
| Sheet Temperature Range    | 355 - 370° F / 180 - 190° C |
| Mold Temperature Range     | 200 - 240° F / 93 - 115° C |
| Max Ejection Temperature   | 240° F / 115° C |
| Heater Watt Density Range  | 12 - 21 W/in² / 1.9 - 3.3 W/cm² |

### DESIGN

Shrinkage - MALE Tool

| 0.3 - 0.7% |

Draw Depth Achievable - Linear

| > 1.7:1 |

Draw Depth Achievable - Area

| > 1.8:1 |

---

* Trademarks of SABIC
# Sheet Processing Guidelines for ALEXTRA™ ET

## TERMOFORMING EVALUATION - DATA SUMMARY

<table>
<thead>
<tr>
<th>Material</th>
<th>LEXAN® EXL1330</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.156 in</td>
</tr>
<tr>
<td></td>
<td>3.96 mm</td>
</tr>
<tr>
<td>Sheet Size Tested</td>
<td>24 x 31 in</td>
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<tr>
<td></td>
<td>610 x 787 mm</td>
</tr>
<tr>
<td>Color</td>
<td>Gray</td>
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</table>

### SAG PERFORMANCE

<table>
<thead>
<tr>
<th>Melt Strength (Sag Rate @ Set Heater Density)</th>
<th>10 in/2.5 min @ 15 W/in²</th>
<th>254 mm/2.5 min @ 2.3 W/cm²</th>
</tr>
</thead>
</table>

### SUGGESTED THERMOFORMING CONDITIONS

<table>
<thead>
<tr>
<th>Drying Temperature</th>
<th>180 - 230° F</th>
<th>110 - 120° C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drying Time</td>
<td>8 - 24 hours</td>
<td></td>
</tr>
<tr>
<td>Sheet Temperature Range</td>
<td>340 - 360° F</td>
<td>170 - 180° C</td>
</tr>
<tr>
<td>Mold Temperature Range</td>
<td>200 - 240° F</td>
<td>93 - 115° C</td>
</tr>
<tr>
<td>Max Ejection Temperature</td>
<td>230° F</td>
<td>110° C</td>
</tr>
<tr>
<td>Heater Watt Density Range</td>
<td>12 - 21 W/in²</td>
<td>1.9 - 3.3 W/cm²</td>
</tr>
</tbody>
</table>

### DESIGN

<table>
<thead>
<tr>
<th>Shrinkage - MALE Tool</th>
<th>0.8 - 1.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw Depth Achievable - Linear</td>
<td>&gt; 1.8:1</td>
</tr>
<tr>
<td>Draw Depth Achievable - Area</td>
<td>&gt; 1.8:1</td>
</tr>
</tbody>
</table>

* Trademarks of SABIC
# Chemical Compatibility Testing for ALEXTRA™

## MATERIAL

<table>
<thead>
<tr>
<th>Product:</th>
<th>LEXAN SLX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade:</td>
<td>1432</td>
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</table>

## TESTING

<table>
<thead>
<tr>
<th>Color:</th>
<th>Black</th>
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</thead>
<tbody>
<tr>
<td>Sample Type</td>
<td>ISO Bars</td>
</tr>
<tr>
<td>Strain, %</td>
<td>0.5</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>23 - 65°C</td>
</tr>
<tr>
<td>Exposure Duration</td>
<td>3 Days</td>
</tr>
<tr>
<td>Number of Cycles</td>
<td>3 Per Day</td>
</tr>
<tr>
<td>Exposure Method</td>
<td>Cotton Wipe</td>
</tr>
<tr>
<td>Date Completed</td>
<td></td>
</tr>
<tr>
<td>Testing Location</td>
<td>GEAM</td>
</tr>
</tbody>
</table>

## CHEMICAL

<table>
<thead>
<tr>
<th>Chemical</th>
<th>RANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline, Unleaded</td>
<td>(-)</td>
</tr>
<tr>
<td>Diesel Fuel</td>
<td>(+)</td>
</tr>
<tr>
<td>W.W. Fluid, OptiKleen (GM)</td>
<td>(-)</td>
</tr>
<tr>
<td>WD-40</td>
<td>(+)</td>
</tr>
<tr>
<td>Windex w/ Ammonia D</td>
<td>(=)</td>
</tr>
<tr>
<td>Isopropanol, ~100%</td>
<td>(+)</td>
</tr>
<tr>
<td>Engine Oil, 10W-30</td>
<td>(+)</td>
</tr>
<tr>
<td>Armor All Protectant</td>
<td>(-)</td>
</tr>
</tbody>
</table>

## RANKING

<table>
<thead>
<tr>
<th>TENSILE (%) Retention</th>
<th>ELONGATION (%) Retention</th>
<th>RANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatible</td>
<td>GREEN</td>
<td>&gt;= 90%</td>
</tr>
<tr>
<td></td>
<td>Marginal</td>
<td>80% - 89%</td>
</tr>
<tr>
<td>Non-Compatible</td>
<td>RED</td>
<td>&lt;= 79%</td>
</tr>
</tbody>
</table>
# Chemical Compatibility Testing for ALEXTRA™ ET

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>LEXAN EXL</td>
</tr>
<tr>
<td>Grade</td>
<td>1330</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>TESTING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Sample Type</td>
<td>ISO Bars</td>
</tr>
<tr>
<td>Strain, %</td>
<td>0.5</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>23 - 65 °C</td>
</tr>
<tr>
<td>Exposure Duration</td>
<td>3 Days Per Day</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>Exposure Method</td>
<td>Cotton Wipe</td>
</tr>
<tr>
<td>Date Completed</td>
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</tr>
<tr>
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<td>GEAM</td>
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<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>RANKING</th>
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<tbody>
<tr>
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<td>Diesel Fuel</td>
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<td>Windex w/ Ammonia D</td>
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</tr>
<tr>
<td>Isopropanol, ~100%</td>
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</tr>
<tr>
<td>Engine Oil, 10W-30</td>
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</tr>
<tr>
<td>Armor All Protectant</td>
<td>(-)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TENSILE (% Retention)</th>
<th>ELONGATION (% Retention)</th>
<th>RANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatible GREEN</td>
<td>&gt;= 90%</td>
<td>80% - 139%</td>
</tr>
<tr>
<td>Marginal YELLOW</td>
<td>80% - 89%</td>
<td>65% - 79%</td>
</tr>
<tr>
<td>Non-Compatible RED</td>
<td>&lt;= 79%</td>
<td>&lt;= 64% or &gt;= 140%</td>
</tr>
</tbody>
</table>
Sheet Drying Guidelines for **ALEXTRA™**

**Sheet Storage**
- Sheet drying prior to use can be eliminated ONLY when material is kept properly packaged after extrusion and stored in climate controlled environment with Relative Humidity < 20% and held at an Ambient Temperature of >80F.

**Drying Sheet Conditions**
- Sheet should be separated to optimize drying capability and air flow
- Racking or hanging sheet are both acceptable methods
- Sheet CAN BE Dried with Protective Masking
- Temperature: 180–230F (DO NOT Exceed 200F with Protective Masking)
- Time: 8 – 24 Hours (Lower Temperature Longer Times)
- Sheet having Protective Masking will remain tacky until it reaches ~100F

**Drying Equipment**
- Hot Air Circulating Oven with Filters (Filter Required for Protective Masking)
- Desiccant bed dryer may be required in high humidity environments
Repair Guidelines for ALEXTRA™ (Light Scratches)

Repair Kit:
1. Orbital Sander (i.e. Hutchins 3800) with 6” Hook-It Pad (#95774)
2. 3M-P1200 wet sanding paper
3. 3M-P1500 wet sanding paper
4. Soft clean cotton cloths
5. Heavy duty buffer (2000 RPM capability, electric or pneumatic)
6. 3M-#05955 Super Duty Compound
7. 3M-#05933 Perfect-It III Compound
8. 3M#05937 Perfect-It III Glaze
9. 3M-#5711 (tan) wool cutting pad
10. 3M-#5725 (black) foam polishing pad

Procedure:
Step 1: Clean the entire area to be repaired with clean water.

Step 2: Using 1200 grit sandpaper, water-sand entire scratched area until original scratch is no longer visible. Use either a finishing sander or wet sanding block. Always flush with water while sanding. This will increase sandpaper life and keep the sanded surface cool. Wipe the repair area dry and visually inspect to be sure that original scratch has completely disappeared.

Step 3: Repeat Step 2 using 1500 grit sandpaper until all 1200 grit scratches are removed. Pay close attention to edges because the 1200 grit scratches will be extremely difficult to remove while buffing in Step 4.
Repair Guidelines for ALEXTRA™ (Light Scratches, cont.)

Step 4: Install cutting pad 3M #5711 on buffer and spread a small amount (approx ½ tsp.) of compound #05955. Buff slowly and steadily over small area so as not to heat surface as this may cause warping or melting of the plastic. Buff entire sanded area until all sanding scratches have disappeared. Use as much buffing compound as necessary to achieve this step. If at any time the original scratches are still seen, repeat steps 2 and 3 as needed. When all 1500 grit scratches have disappeared, there will be a dull luster over entire area.

Step 5: Install polishing pad #5725 (black foam pad) on buffer and repeat Step 4 using #-5933 buffing compound (approx. 1/2 tsp). Buff until scratches have disappeared. It may be necessary to apply additional compound to achieve this. The result will be an almost-finished product with a very high luster and very few buffer swirls.

Step 6: Using a clean polishing pad #5725 and finish glaze #05937, apply a slightly smaller amount of material than in Steps 4 and 5 and buff to desired gloss.

Step 7: Wipe clean with soft, clean cloth. Any dirt on cloth can mar the surface.

- Entire Surface Lightly Scratched
- Right Side Repaired With 3M Perfect-It™
- Gloss Restored to Original Levels
Repair Guidelines for ALEXTRA™ (Deep Gouges)

**Repair Kit:**

1. Light detergent and clear water
2. Urethane-compatible tack cloth
3. 3M-P80 wet sanding paper
4. 3M-P180 wet sanding paper
5. 3M-P150 2-1/2” x 17” wet sanding paper
6. 3M-P320 wet sanding paper
7. DuPont Full Thane 421-15 & 483-77 Primer and Activator
8. DuPont #3939 Panel Cleaner
9. DuPont #42470S & 42455S Sealer and Activator
10. HVLP spray gun
11. Ingersoll-Rand Dual Action Sander #IR311A in 6”
12. 3M-5740 4” sanding block
13. 3M-#05955 Super Duty Compound
14. Fiber Glass-Evercoat 100420
15. Heavy duty buffer (Chicago Pneumatic 869P)

**Procedure:**

Step 1: Clean entire area to be repaired with clean water and detergent.

Step 2: Lightly sand and round off any sharp surfaces with 80 grit sanding paper held flat on the part until any raised edges are as flat as original surface. The 80 grit scratches should extend at least 2 inches beyond the repair area to provide plenty of room to complete the repair. Remove accumulated dust using an air gun.

Step 3: Using Evercoat 100420 repair material, spread filler back and forth over repair area until all gouges are filled. Let the material dry over the recommended time interval.
Repair Guidelines for **ALEXTRA™**

**Step 4:** Sand the repair area with a 400 grit block or board sander (depending on size of repair area) until the area is void of defects. It is important to hold sanding tools only within the repair area to avoid effecting the undamaged surface.

**Step 5:** After sanding is complete and the repair area smoothed, prime with Dupont Full Thane Primer System (2-3 coats). Let dry the recommended time.

**Step 6:** Water-sand with block or Dual Action Sander using 320 to 1200 grit film (depending on repair severity) until any scratches or imperfections are no longer visible. Clean adjoining areas with 3M compound, and buff until clean.

**Step 7:** Wash part with Dupont #3939S Panel Cleaner washing only 1-2 foot sections at a time. Using clean towel, dry the repair area. Use an air gun to blow off any dust or debris from repaired part and adjoining areas.

**Step 8:** Mask off any areas not to be refinished. Do not mask area to be painted. Use tack cloth to wipe down area to be refinished (2-3 times).

**Step 9:** Apply medium wet-coat of Dupont sealer. Let dry as per label instructions, then apply desired topcoats (2K Clear) making sure to tack between coats.

- Deep Gouges Applied to Surface
- Standard Automotive Repair Procedure
- Potential Miss-Match in Gloss
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Appendix
Industry Segment Trends

Reduce Systems & Component Cost
- Competitive Cost versus SMC, FRP or Metal
- Eliminate Paint and Other Secondary Operations
- Improve Quality, Yields and Product Life Cycle
- Consolidate Parts, Reduce Stock & Assembly Cost

Improve Styling & Functionality
- Class A Surfaces with or without Paint
- Achieve Size and Styling Criteria
- Simplification of Assembly Design
- Design for Manufacturing & Serviceability
- Ability to Apply Curvature –Not Justifiable Using Metals

Long-Term Toughness & Durability
- Impact Strength at Temperature Extremes
- Weatherability > 4 years . .Aids in Resale Value
- Resist Heat Load and Thermal Sun Load
- Scratch Resistance
- Corrosion & Chemical Resistance

Reduce Component Weight
- Fuel Savings
- Lower Operating Cost
- Increase Passenger Load
- Add Marketable Features and Functions
Design Space

**Cap Layer Grade:** (0.25-0.5mm)
Lexan* SLX 1432 – Opaque

**Color Space:**
- High-Chroma Solids
- Non-Whites (<75 on DL*)
- Non-Metallics

**Surface Appearance:**
- High gloss 100–110 at 60D
- Texture – Extrusion rolls

**Scratch Resistance:**
- Improved over PC

**Weathering: (Customer Defined)**
- Accelerated test of LEXAN SLX1432 resin
- Color & Property retention
- Up to 5 years – Color dependent

---

**Co-Extruded Sheet Systems:**

**Available Substrate Materials**

- **Alextra™ MV sheet**
  - Cycoloy* MC8100 resin
  - [Datasheet](#)

- **Alextra™ TS sheet**
  - Cycoloy CE1820 resins
  - [Datasheet](#)

- **Alextra™ ET sheet**
  - Lexan EXL1330 resins
  - [Datasheet](#)

**Process:**
- Thermoforming
- PC Sheet conditions
- Temp. Control Molds

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* Trademarks of SABIC
### Material Comparisons

#### Typical Properties

<table>
<thead>
<tr>
<th>Usage</th>
<th>SLX1432</th>
<th>MC8100</th>
<th>CE1820</th>
<th>EXRL0438</th>
<th>EXL1330</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap</td>
<td>MV</td>
<td>TS</td>
<td>ET</td>
<td>ET</td>
<td></td>
</tr>
</tbody>
</table>

#### Mechanical

- Tensile Stress, yld, Type I, 2.0 in/min: 9500 psi, 7500 psi, 8100 psi, 8000 psi, 8400 psi, ASTM D 638
- Tensile Strain, yld, Type I, 2.0 in/min: 6.1%, 5%, 9%, 6%, 6%, ASTM D 638
- Tensile Strain, brk, Type I, 2.0 in/min: 126%, 100%, 121%, 98%, 130%, ASTM D 638
- Tensile Modulus, 2.0 in/min: 365000 psi, 299000 psi, 479000 psi, 292000 psi, 299000 psi, ASTM D 638
- Flexural Stress, yld, 0.05 in/min, 2 in span: 15200 psi, 11100 psi, 13900 psi, 13300 psi, 12600 psi, ASTM D 790
- Flexural Modulus, yld, 0.05 in/min, 2 in span: 361000 psi, 299000 psi, 434000 psi, 323000 psi, 299000 psi, ASTM D 790

#### Impact

- Izod Impact, notched, 73°F: 16.1 ft-lb/in, 10 ft-lb/in, 8 ft-lb/in, 16.2 ft-lb/in, 15 ft-lb/in, ASTM D 256
- Izod Impact, notched, -22°F: 2.3 ft-lb/in, 8 ft-lb/in, 2 ft-lb/in, 14.5 ft-lb/in, 12.7 ft-lb/in, ASTM D 256
- Izod Impact, notched, -60°F: 11 ft-lb/in, 11 ft-lb/in, ASTM D 256
- Instrumented Impact Total Energy, 73°F: 672 in-lb, 479 in-lb, 504 in-lb, 619 in-lb, 467 in-lb, ASTM D 3763

#### Thermal

- CTE, flow, -40°F to 100°F: 3.44E-05, 4.50E-05, 3.67E-05, 3.87E-05, 3.70E-05, 1°F, ASTM E 831

#### Physical

- Specific Gravity: 1.22, 1.13, 1.22, 1.18, 1.18, ASTM D 752
- Water Absorption, equilibrium, 73°F: 0.3%, 0.4%, 0.4%, 0.35%, 0.35%, ISO 62, *ASTM D 570
- Mold Shrinkage, flow, 0.125": 0.6-0.8, 0.4-0.7, 0.4-0.6, 0.4-0.8, 0.4-0.8, GE Method

#### Flame Characteristics

- UL Recognized, 94HB Flame Class Rating (3): 0.028, 0.031, in, UL 94
- Oxygen Index (LOI): 37, 35, %, ISO 4589

All data taken from SABIC datasheets available on the previous slide. This chart is for overview purposes only. Consult actual datasheets for actual values and for proper usage guidelines.