Artisan™ AR7300
PRE-COLORED FORMULATIONS
Artisan™ Pre-Colored Thermoplastics

Artisan™ AR7300 pre-colored thermoplastics are customized ABS formulations to help manufacturers achieve brilliant and high-gloss metallic effect, excellent chemical resistance, and scratch resistance. Compared with a traditional painting process, injection-molded Artisan materials also offer additional sustainable benefits: energy use and VOC emissions are reduced by eliminating secondary painting or in-mold labeling. These materials can be widely applied in consumer electronics applications with high performance requirements.

<table>
<thead>
<tr>
<th>BASE RESIN</th>
<th>ABS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drying Temperature</td>
<td>80–90°C</td>
</tr>
<tr>
<td>Drying Time</td>
<td>2–3 Hours</td>
</tr>
<tr>
<td>Barrel Temperatures</td>
<td>°C</td>
</tr>
<tr>
<td>Rear Zone</td>
<td>180–210</td>
</tr>
<tr>
<td>Center Zone</td>
<td>190–220</td>
</tr>
<tr>
<td>Front Zone</td>
<td>200–230</td>
</tr>
<tr>
<td>Nozzle</td>
<td>210–240</td>
</tr>
<tr>
<td>Mold Temperature</td>
<td>50–80</td>
</tr>
<tr>
<td>Screw Speed</td>
<td>Moderate</td>
</tr>
<tr>
<td>Back Pressure</td>
<td>3–10 bar</td>
</tr>
<tr>
<td>Cushion</td>
<td>5–15 mm</td>
</tr>
<tr>
<td>Injection Speed</td>
<td>Low to medium</td>
</tr>
<tr>
<td>Injection Pressure</td>
<td>Moderate to high</td>
</tr>
<tr>
<td>Holding Pressure</td>
<td>10–30% of injection pressure</td>
</tr>
<tr>
<td>Screw Type</td>
<td>General purpose</td>
</tr>
<tr>
<td>Screw L/D</td>
<td>20:1</td>
</tr>
<tr>
<td>Screw Compression Ratio</td>
<td>2.0:1–2.5:1</td>
</tr>
<tr>
<td>Non-return Check Valve</td>
<td>Free flow check ring</td>
</tr>
<tr>
<td>Nozzle Type</td>
<td>Reverse taper</td>
</tr>
<tr>
<td>Barrel Capacity</td>
<td>30–80% of barrel should be used</td>
</tr>
<tr>
<td>STARTUP &amp; SHUTDOWN</td>
<td>RECOMMENDATIONS</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Purge Compound</td>
<td>2–3 melt flow PP or purging compound. HDPE is not recommended for purging as it can cause delamination or lead to black specks.</td>
</tr>
<tr>
<td>Re grind</td>
<td>Re grind is not suggested. Can cause issues with color variation, surface defects, loss of properties and may affect the weatherability.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>MOLD DESIGN</th>
<th>RECOMMENDATIONS</th>
</tr>
</thead>
</table>
| Gates       | • Many different types of gates can be used, such as fan, tunnel, tab, and edge gates.  
             • Moderate gate size according to the part geometry. Gate thickness should be 50–75% of wall thickness.  
             • Avoid gating into thin part region. |
| Runners     | • Full-round runners or modified trapezoid runners are the best designs.  
             • Half-round runners are not recommended.  
             • Only naturally balanced runner systems (“H” pattern) are recommended.  
             • Runner diameters should not be less than the part thickness.  
             • Runner diameter should be 1.5x the part thickness.  
             • Step each 90° bend in the system down in size.  
             • Place vents at each 90° intersection and vent to atmosphere.  
             • Hot runner molds are acceptable and should be sized by the manufacturer. |
| Cold Slug Wells | • Place these wells at the base of the sprue to capture the cold material first emerging from the nozzle.  
                     • Place wells at every 90° bend in the runner system.  
                     • Well depths approximately 2.5 times the diameter of the runner provide the best results. |
| Venting      | • Place vents at the end of fill and anywhere potential knit/weld lines will occur.  
                     • All vents need to be vented to atmosphere.  
                     • For circular parts, full perimeter venting is recommended.  
                     • Cut vent depths to 0.0007”–0.0015”. |
<p>| Draft Angle  | • Maintain a minimum draft angle of 1° per side. |</p>
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
</table>
| Incomplete Fill | Melt and/or mold temperature too cold | • Increase nozzle and barrel temperatures  
• Increase mold temperature  
• Increase injection rate  
• Check thermocouples and heater bands |
| | Shot size | • Increase shot size  
• Adjust transfer position to 98% full  
• Increase cushion |
| | Mold design | • Enlarge or widen vents and increase number of vents  
• Check that vents are unplugged  
• Check that gates are unplugged  
• Enlarge gates and/or runners  
• Perform short shots to determine fill pattern and verify proper vent location  
• Increase wall thickness to move gas trap to parting line |
| Britteness | Degraded/overheated material | • Decrease melt temperature  
• Decrease back pressure  
• Use smaller barrel  
• Decrease injection speed |
| | Gate location and/or size | • Relocate gate to non-stress area  
• Increase gate size to allow higher flow rate and lower molded-in stress |
| | Wet material | • Check moisture. If material is not in the recommended moisture percentage for molding, dry material until it is in the acceptable range for molding. |
| Fibers on Surface (Splay) | Melt temperature too low | • Increase melt temperature  
• Increase mold temperature  
• Increase injection speed |
| | Wet material | • Check moisture. If material is not in the recommended moisture percentage for molding, dry material until it is in the acceptable range for molding. |
| Sink Marks | Melt too hot | • Decrease nozzle and barrel temperatures  
• Decrease mold temperature |
| | Insufficient material volume | • Adjust transfer position  
• Increase shot size  
• Increase injection rate  
• Increase packing pressure |
| | Part geometry too thick | • Reduce wall thickness  
• Reduce rib thickness |
# Troubleshooting Recommendations

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Flash Injection pressure too high | • Adjust transfer position  
• Decrease pack pressure  
• Decrease shot size  
• Decrease injection rate | • Decrease injection pressure  
• Increase clamp pressure  
• Decrease injection rate  
• Increase transfer position |
| Excess material volume | • Adjust transfer position  
• Decrease pack pressure  
• Decrease shot size  
• Decrease injection rate | • Adjust transfer position  
• Decrease pack pressure  
• Decrease shot size  
• Decrease injection rate |
| Melt and/or mold temperature too hot | • Decrease nozzle and barrel temperatures  
• Decrease mold temperature | • Decrease nozzle and barrel temperatures  
• Decrease mold temperature |
| Loose clamp | • Reset mold height  
• Increase clamp tonnage | • Reset mold height  
• Increase clamp tonnage |
| Shrink Too much shrink | • Increase cooling time  
• Decrease mold temperature | • Increase cooling time  
• Decrease mold temperature |
| Too little shrink | • Decrease cooling time  
• Increase mold temperature | • Decrease cooling time  
• Increase mold temperature |
| Burning Process related | • Decrease nozzle and barrel temperatures  
• Decrease mold temperature  
• Decrease injection rate  
• Reduce decompression | • Decrease nozzle and barrel temperatures  
• Decrease mold temperature  
• Decrease injection rate  
• Reduce decompression |
| Mold design | • Clean, widen and increase number of vents  
• Increase gate size to reduce shear | • Clean, widen and increase number of vents  
• Increase gate size to reduce shear |
| Wet material | • Verify material is dried at proper condition | • Verify material is dried at proper condition |
| Nozzle Drool Nozzle temperature too hot | • Decrease nozzle temperature  
• Decrease back pressure  
• Increase screw decompression  
• Verify material has been dried at proper conditions | • Decrease nozzle temperature  
• Decrease back pressure  
• Increase screw decompression  
• Verify material has been dried at proper conditions |
| Incorrect nozzle | • Use reverse taper tip | • Use reverse taper tip |
| Melt front temperatures are too low | • Increase injection rate  
• Increase pack and hold pressure  
• Increase melt temperature  
• Increase mold temperature | • Increase injection rate  
• Increase pack and hold pressure  
• Increase melt temperature  
• Increase mold temperature |
| Weld Lines Mold design | • Increase gate size  
• Identify end of fill pattern and verify proper vent location  
• Add vents or increase vent width  
• Move gate location | • Increase gate size  
• Identify end of fill pattern and verify proper vent location  
• Add vents or increase vent width  
• Move gate location |
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| Warp             | Process related        | • Increase melt temperature  
                    • Reduce injection speed  
                    • Increase pack pressure  
                    • Increase pack time  
                    • Decrease mold temperature  
                    • Increase cool time |
|                  | Mold design            | • Non-uniform mold cooling |
|                  | Part design            | • Non-uniform wall thickness |
|                  | Thermolator incorrect temperature | • Check settings  
                                   • Inspect thermocouple |
| Sticking in Mold | Overfilled cavity      | • Decrease injection rate and pressure  
                    • Decrease hold pressure  
                    • Adjust transfer position  
                    • Decrease nozzle and barrel temperatures  
                    • Decrease mold temperature  
                    • Decrease cooling time |
|                  | Part too hot           | • Decrease barrel temperature  
                    • Decrease mold temperature  
                    • Increase cooling time |
|                  | Mold design            | • Increase draft angle  
                    • Polish cores in direction of ejection |
|                  | Contamination          | • Purge machine |
| Black Specks     | Degradation            | • Reduce melt temperature  
                    • Reduce screw speed  
                    • Reduce back pressure |
|                  | Machine related        | • Check for wear on screw, barrel or check ring |
| Delamination     | Process related        | • Increase melt temperature  
                    • Decrease injection speed  
                    • Purge barrel to eliminate material contamination |
|                  | Mold design            | • Reduce sharp corners in material flow path  
                    • Increase venting |
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<th>SOLUTION</th>
</tr>
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</table>
| Discoloration| Oversheared material| • Decrease melt temperature  
                  • Decrease injection speed  
                  • Reduce residence time   |
|             | Mold design        | • Increase gate sizing                                                   |
|             | Dry material       | • Check moisture of material to ensure it is within the recommended moisture percentage for molding |