Are you looking for a way to provide moisture, dust-free packaging for electronics all while increasing product performance?

Aptar CSP Technologies active molded polymers provide superior protection.

Combating moisture ingress and controlling humidity and other harmful gasses is essential to protect sensitive components in electronics. Aptar CSP Technologies offers advanced solutions to protect sensitive electronics from damage caused by exposure to environmental elements including water and temperature. When subject to temperature variation, moisture can cause water drops to form ultimately leading to conductivity disruption and/or the appearance of fog on the optical components. To prevent malfunction caused by corrosion, electrical shorts and reduced battery life, components contained in electronics must remain dry even when exposed to rugged environments. Extending battery life reduces the need for expensive and time-consuming installations which is critical for cost control.

Existing solutions include insulating sprays and coatings, epoxy and polyurethane resins, placing tight casings around electronics, and inserting desiccant sachets in casings. While these options mitigate the effects of condensation and provide some level of protection, they have limitations. They lack water resistance, cost efficiency, are not easy to process, add steps to the manufacturing process, are not environmentally friendly or recyclable, have limited temperature range performance and risk exposure to damaging elements such as dust and other impurities.

Aptar CSP Technologies is an expert in custom molded active components based on our patented Activ-Polymer™ technology. Our multi-shot molding capability with integrated scavenging enables us to combine multiple components and scavenging abilities into one part reducing complexity for manufacturing and assembly. We can replace an existing component in the physical structure of your design to provide structure and protection simultaneously. The advantage: control of moisture within the environment without the need for extra space or changes to your design.

Our patented three-phase Activ-Polymer™ technology is comprised of a network of interconnected, transmitting channels to facilitate the diffusion of gasses into the polymer matrix. This channel structure enables Aptar CSP Technologies to engineer formulations that absorb or release gasses from polymers. In addition, our solutions do NOT use environmentally damaging epoxies or polyurethane resins, enabling safe recycling.

We can create tight seals that prevent air and moisture ingress under extreme conditions. In addition, we can create a single-part protection solution that releases low/no particles, all while providing a dust-free environment specifically for your components.

Industries Served

- Electronics
- Automotive
- Aerospace
- Industrial
# About Aptar CSP Technologies

Aptar CSP Technologies is a leader in delivering innovative, high-quality product and packaging solutions that give customers a competitive edge and consumers a better product experience.

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## Electronics

Protect Sensitive Electronics from Condensation with Active Molded Polymers

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### Advantages of Aptar CSP Technologies solution versus Existing Capabilities

<table>
<thead>
<tr>
<th>Metric</th>
<th>Varnish insulation</th>
<th>Tight Casimg (TC)</th>
<th>TC + Silica Gel sachets</th>
<th>Resin Potting</th>
<th>TC + Aptar CSP Technologies solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Protection</td>
<td>Not Water Resistant</td>
<td>Depend on Tight casing design (IP 6)</td>
<td>Depend on Tight casing design (IP 6)</td>
<td>Good but risk or water penetration per capillarity</td>
<td>Depend on Tight casing design (IP 6)</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>Depends on material used</td>
<td>Depends on material used</td>
<td>SG releases moisture above 60°C</td>
<td>Depends on material used</td>
<td>Up to 80°C w/existing technology</td>
</tr>
<tr>
<td>Condensation Protection</td>
<td>LOW</td>
<td>❌</td>
<td>Short Term</td>
<td>❌</td>
<td>LONG TERM</td>
</tr>
<tr>
<td>Environmentally Friendly</td>
<td>❌</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>End of Life Recycling</td>
<td>Depends on Varnish</td>
<td>✓</td>
<td>✓</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Ease To Process</td>
<td>VERY COMPLEX</td>
<td>EASY</td>
<td>EASY</td>
<td>VERY LONG</td>
<td>EASY</td>
</tr>
<tr>
<td>Repair</td>
<td>Yes, but no varnish</td>
<td>✓</td>
<td>✓</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>General Comments</td>
<td>Difficult to apply varnish everywhere</td>
<td>N/A</td>
<td>High risk of pollution from desiccant dust</td>
<td>Poor heat exchange (cooling)</td>
<td>Can combine multiple parts into one</td>
</tr>
</tbody>
</table>

### Benefits

- **Longer Life** - Protect sensitive components, like batteries, printed circuit boards, and LED’s from moisture, which causes damaging corrosion and malfunction
- **Appearance** - Eliminates fogging for sight glasses or gauges
- **Eco-friendly** - Avoids use of toxic epoxies, polyurethane resins, or dusty desiccant sachets required by other solutions
- **Design Efficiency** - Can utilize space constraints of existing designs to incorporate integrated desiccant technology
- **Reduced Cost** - Ability to combine multiple components and scavenging abilities into one-part to reduce manufacturing and assembly time