Microelectronics assembly using flip chip and direct chip attach is an emerging trend within the electronics industry. To facilitate the move to bare-die assembly, highly reliable protection materials must be provided which allow fast production cycles.

Loctite® and Hysol® Underfills and Encapsulants offer extremely reliable protection combined with ultra-high process speeds.

As a technology leader, Loctite® and Hysol® offer competent solutions to customers, thus supporting their Research and Development efforts and commercial success.
Underfills and Encapsulants from Loctite® and Hysol®

Loctite® and Hysol® Underfills for flip chips

The continuous trend towards smaller, lighter and highly populated electronic packages is reflected in the constantly growing application of flip chip technology. Loctite® and Hysol® flip chip underfills are high-purity, liquid adhesives designed for the increase of reliability in flip chip devices. They fulfill the industry's stringent requirements in regards to ionic contents, coefficient of thermal expansion and glass transition temperature. Due to their extremely fast flowing capabilities they are easily dispensed – this results in supporting fast processing rates.

Key features:

- Fast cure at moderate temperatures.
- Extremely fast flow.
- Outstanding thermal cycling resistance.
- Excellent humidity resistance.
- Minimise induced stresses.

Loctite® and Hysol® Underfill for CSP/BGA

Chip scale packages (CSP) and ball grid array packages (BGA) have originally been designed without underfill. Nevertheless, it appeared that failures occurred due to lack of mechanical shock and thermal cycling resistance. In these cases a reliable underfill material that provides a stable interface between the package and the printed circuit board is essential. Loctite® underfills significantly improve the reliability of CSP and BGA packages.

Key features:

- Fast curing performance.
- Excellent reliability against thermal cycling and mechanical shock.
- Fast wicking ability
- Reworkable (3513, 3568, FP 6100)

GLOB TOPS / ENCAPSULANTS

<table>
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<tr>
<th>Product</th>
<th>Applications</th>
<th>Pot life @ 25 °C</th>
<th>Recommendet Cure</th>
<th>Flow Properties</th>
<th>Viscosity @ 25 °C</th>
<th>TG (°C)</th>
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<th>Storage Temp. (°C)</th>
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<tr>
<td>Hysol® EO 1016</td>
<td>COB, Watch Ics</td>
<td>3 months</td>
<td>15 min. @ 150 °C</td>
<td>Medium</td>
<td>70,000 cps</td>
<td>115</td>
<td>4</td>
<td>-40</td>
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<tr>
<td>Hysol® EO 1061</td>
<td>Chip on Board</td>
<td>25 days</td>
<td>4-6 hrs @ 125 °C</td>
<td>Medium</td>
<td>45,000 cps</td>
<td>125</td>
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<tr>
<td>Hysol® EO 1072</td>
<td>Variable Flow Dam and Fill</td>
<td>30 days</td>
<td>5 min. @ 140 °C</td>
<td>Variable</td>
<td>80,000 cps</td>
<td>135</td>
<td>43</td>
<td>5</td>
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<tr>
<td>Hysol® FP 4401</td>
<td>Low Stress IC encapsulant for ceramic and other substrates</td>
<td>24 hrs</td>
<td>3 hrs @ 160 °C; Low stress cure 2 hrs @ 125 °C + 4 hrs @ 150 °C</td>
<td>Low</td>
<td>102,000 cps</td>
<td>160</td>
<td>22</td>
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<td>Hysol® FP 4451</td>
<td>Flow Control Barrier (Dam)</td>
<td>48 hrs</td>
<td>30 min. @ 125 °C + 90 min. @ 165 °C</td>
<td>None</td>
<td>860,000 cps</td>
<td>145</td>
<td>24</td>
<td>-40</td>
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<tr>
<td>Hysol® FP 4450 LV</td>
<td>ICS COB, BGA, PGA</td>
<td>3 days</td>
<td>30 min. @ 125 °C + 90 min. @ 165 °C</td>
<td>High</td>
<td>35,000 cps</td>
<td>155</td>
<td>22</td>
<td>-40</td>
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</tbody>
</table>

For detailed product performance information and application guidelines, please refer to Technical Data Sheets or contact Loctite®.

Henkel Loctite Adhesives Limited

Watchmead · Welwyn Garden City
Hertfordshire AL7 1J B
Phone: 01707 358800 · Fax 01707 358900
www.loctite.com

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