

# STANDARD CATALYSTS

| CATALYST  | 9   | 11   | 14  | 15  |
|---|---|--|---|---|
| Type  | Modified aliphatic amine  | Modified aromatic amine  | Anhydride   | Polyamide   |
| Viscosity   | 80 – 100 mPa.s  | 35 – 60 mPa.s (at 35°C)  | Powder  | 20 – 40 Pa.s  |
| Colour  | Amber   | Tan to dark brown  | White   | Black   |
| Density (g/cm <sup>3</sup> )  | 0,99 - 1,01   | 1,0 - 1,1  | 0,77 – 0,79   | 0,95 - 0,98   |
| Amount of Catalyst used in relation to CATALYST 9 (in x CATALYST 9) | 1,00  | 1,20   | 2,5   | 7,0 - 21,1  |
| Pot life (100 g at 25°C)  | 45 min  | 4 h  | 24 h  | 2 h   |
| Shelf life at RT  | 1 year in unopened containers   | 1 year in unopened containers  | 1 year in unopened containers                                   | 1 year in unopened containers   |
| Cure schedule   | 16 to 24 h at RT<br>or<br>2 h at 65°C   | 2 h at 100°C<br>+<br>4 h at 150°C  | 3 h at 150°C<br>+<br>3 to 16 h at 180°C                         | 16 to 24 h at RT<br>or<br>2 h at 80°C   |
| Service Temperature (°C)<br>- Continuous<br>- Intermittent          | 130<br>150  | 180<br>200   | 180<br>200  | 90<br>120   |
| Advantages  | Chemical resistant<br>Physical Strength<br>RT cure<br>Low viscosity<br>Low cost | Outstanding chemical resistance<br>Physical strength<br>Pot life<br>Low viscosity<br>High temperature performance<br>Thermal shock resistant (in some cases)   | High temperature performance<br>Chemical resistance<br>Pot life | RT cure<br>Adjustable flexibility<br>Pot life<br>Low toxicity<br>Wide mixing ratio<br>Low cost    |
| Disadvantages   | Brittle (not good for low temperature)<br>Pot life<br>Toxicity                  | Elevated temperature cure<br>Stains skin<br>May crystallise at RT (heat to 65°C to liquify)<br>Cost<br>Toxicity  | High temperature cure<br>Odour                                  | High viscosity<br>Softens at elevated temperature   |
| Other comments  | Good all-round epoxy curative   | CATALYST 11 is subject to partial crystallisation at RT<br>To remove crystals warm gently to at least 65°C and maintain until all crystals have gone into solution<br>Storage is possible for several days at RT without crystallisation | Keep away from moisture   | Easiest epoxy curative to use<br>Can mix with epoxy even without sophisticated weighing equipment |

| <b>CATALYST</b>   | <b>15 LV</b>  | <b>17</b>   | <b>23 LV</b>   | <b>24 LV</b>   |
|---|---|---|--|--|
| Type  | Polyamide   | Anhydride   | Modified aliphatic amine   | Modified aliphatic amine   |
| Viscosity   | 5 – 15 Pa.s   | slurry (at 35°C)  | 20 – 30 mPa.s  | 30 – 40 mPa.s  |
| Colour  | Black   | Blue - grey   | Water-white to slight amber  | Water white to slight amber  |
| Density (g/cm <sup>3</sup> )  | 0,95 – 0,98   | 1,3 - 1,5   | 1,00 - 1,03  | 1,00 - 1,03  |
| Amount of Catalyst used in relation to CATALYST 9 (in x CATALYST 9) | 3,5 – 14,0  | 2,8   | 2,00   | 2,00   |
| Pot life (100 g at 25°C)  | 2 h   | 24 h  | 60 min   | 30 min   |
| Shelf life at RT  | 1 year in unopened containers   | 1 year in unopened containers   | 1 year in unopened containers  | 1 year in unopened containers  |
| Cure schedule   | 16 to 24 h at RT<br>or<br>2 h at 80°C   | 3 h at 120°C<br>+<br>2 h at 150°C<br>+<br>16 h at 175°C   | 16 to 24 h at RT<br>or<br>4 h at 65°C  | 8 to 16 h at RT<br>or<br>2 h at 65°C   |
| Service Temperature (°C)<br>- Continuous<br>- Intermittent          | 65<br>90  | 230<br>(260)  | 105<br>120   | 105<br>120   |
| Advantages  | RT cure<br>Adjustable flexibility<br>Pot life<br>Low toxicity<br>Wide mixing ratio<br>Low cost    | Very good high temperature performance<br>Pot life<br>Low viscosity   | Low viscosity<br>Low cost<br>Thermal shock resistance<br>Pot life<br>Tough impact resistance<br>Low colour | Low viscosity<br>Thermal shock resistant<br>Tough impact resistant<br>Low colour |
| Disadvantages   | Softens at elevated temperature   | Elevated temperature cure<br>High cost  | Longer cure at RT than CATALYST 24 LV  | Pot life<br>Cost   |
| Other comments  | Easiest epoxy curative to use<br>Can mix with epoxy even without sophisticated weighing equipment | CATALYST 17 may be solid at RT<br>When warmed to 65°C, it will liquefy. Cool down to room temperature before use. |  | Has tendency to semi-thixotrope various epoxy systems                            |

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| CATALYST  | 27-1   | 28   | 30   | 43   |
|---|--|--|--|--|
| Type  | Modified aromatic amine  | Modified aromatic amine  | Modified aliphatic amine   | Imidazole / aliphatic amine                        |
| Viscosity   | 250 – 300 mPa.s  | 250 – 300 mPa.s  | 70 – 90 mPa.s  | 40 – 60 mPa.s                                      |
| Colour  | Brown  | Brown  | Slight amber   | Amber  |
| Density (g/cm <sup>3</sup> )  | 1,00 – 1,05  | 1,00 – 1,05  | 0,92 - 0,96  | 0,90 – 1,10  |
| Amount of Catalyst used in relation to CATALYST 9 (in x CATALYST 9) | 1,75   | 1,75   | 2,70   | 0,75   |
| Pot life (100 g at 25°C)  | 2 h  | 2,5 – 3 h  | 60 min   | 40 min   |
| Shelf life at RT  | 1 year in unopened containers  | 1 year in unopened containers  | 1 year in unopened containers  | 1 year in unopened containers                      |
| Cure schedule   | 4 h at 120°C   | 4 h at 120°C   | 24 h at RT<br>or<br>4 h at 65°C  | 16 to 24 h at 65°C<br>and<br>2 to 4 hours at 150°C |
| Service Temperature (°C)<br>- Continuous<br>- Intermittent          | 175<br>200   | 175<br>200   | 90<br>120  | 205  |
| Advantages  | Chemical resistance<br>Physical strength<br>Pot life<br>High temperature performance   | Chemical resistance<br>Physical strength<br>Pot life<br>High temperature performance | Non-blushing<br>Resilient (more than CATALYST 9)<br>Low viscosity<br>RT cure<br>Low colour | High temperature resistant<br>Low cure temperature |
| Disadvantages   | Elevated temperature cure<br>Cost  | Elevated temperature cure<br>Cost  | Cost   | Brittleness  |
| Other comments  | Non-staining alternative for CATALYST 11 ;<br>Cannot be used in combination with the following products :<br>STYCAST 2057 /<br>STYCAST 2651 MM Series /<br>STYCAST 2741 LV /<br>STYCAST 3050 /<br>ECCOBOND 45 LV | Non-staining alternative for CATALYST 11   | Excellent epoxy curative if appearance is important  | Non-staining alternative for CATALYST 11           |

**Health & Safety :**

It is recommended to consult the Emerson & Cuming product literature, including material safety data sheets, prior to using Emerson & Cuming products. These may be obtained from your local sales office.

**Note :**

Please note that Technical Data Sheets may be updated from time to time. Customers are advised that the latest technical bulletins are always available upon request.

**Attention Specification Writers :**

The technical information contained herein is generally consistent with the properties of the material and should not be used in the preparation of specifications, as it is intended for reference only. This technical information has been derived from one batch of material and may not exactly match the properties of each individual delivered batch. For assistance in preparing specifications, please contact your local Emerson & Cuming office for details. Please contact Emerson & Cuming Quality Assurance for test method details.

EU-12/10/2006-RVH/MR/JS/LM/HG/KS (0980s)

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