



Innovating epoxies for a better world

# Automotive Applications

## Epotec Epoxy Systems



[www.epotec.info](http://www.epotec.info)



The company has a fully fledged R&D and Application Development Centre (ADC) and its testing facilities are accredited by Germanischer Lloyd (GL).

Epotec resin systems are well established in the industry and used by leading Wind Blade manufacturers. The product portfolio also includes novel and patented systems for infusion process which enables productivity improvement in manufacturing and also epoxy foam systems which possess the potential of replacing existing core materials used in the wind blade.

The company offers high level of technical expertise to work jointly with the end users to troubleshoot and in improving, customizing the product performance based on the processing conditions in manufacturing.

The company has well developed range of Germanischer Lloyd (GL) certified products for wind blade applications which includes epoxy systems for Tooling / molds, Gel coat, Prepreg, Infusion, Laminating resins for repair applications, Structural Adhesive and Expandable epoxy foam.

**Manufacturing** **Research Center** **Sales Offices**

- |                   |                              |   |
|-------------------|------------------------------|---|
| Thailand<br>India | Thailand<br>India<br>Germany | Thailand<br>India<br>USA<br>Europe<br>Middle East |
|-------------------|------------------------------|---|

### Aditya Birla Chemicals (Thailand) Ltd.

Aditya Birla Chemicals (Thailand) Limited (Epoxy Division) is largest manufacturer of epoxy resin and systems in the ASEAN region. Its Epotec® epoxy resins and systems are exported to all continents and the product portfolio extends to all segments of epoxy applications. Its Application Development Centre (ADC) has been recently accredited by Germanischer Lloyd (GL) bringing it in the pool of top testing laboratories for composite materials. It has also won the prestigious JEC Asia Innovation award 2012 in the Materials category



Our Innovative R&D Team

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Growing environmental concerns leading to introduction of legislation on lower carbon dioxide emissions, demand for increased fuel efficiency and power to weight ratios has resulted in drive towards greener, lighter and energy efficient vehicles. Since the improvement in fuel efficiency is directly linked to reduced mass, Composite materials are one of the most viable alternatives.

Composites enable weight reduction up-to 40% compared to conventional metals of equal strength apart from providing better internal damping, low - noise, vibration & harshness (NVH) and unrivalled corrosion resistance. Further the tooling costs for manufacturing composite parts are significantly lower meeting manufacturer's trend towards reduced build per model. Historically the use of composite materials in automotive applications has been limited to the high value- luxury segment which includes racing cars and to extend the use in high volume or mass market segment it is essential to develop new materials and processes which enable reduced cycle time without compromising on the strength and aesthetics.

Epotech Epoxy Systems for AutoComposite applications are designed to meet requirements standard composite manufacturing processes such as Resin Transfer Molding (RTM), and prepregs as well as for new improved processes; HP-RTM (High Pressure RTM) and SMC (Sheet Molding Compound). Novel systems such as Expandable epoxy enable significant reduction in weight when used to make sandwich panels with natural fibers.

### Epotech RTM Systems:

Designed to provide short cycle time to suit requirements for volume production, suitable for standard RTM as well as High Pressure RTM processes. Selection of the system depends on the type and dimensions of the component, processing conditions and the temperature resistance needed.

| Epotech Grade      | De-molding time <sup>1</sup> | Post curing time/ temp <sup>2</sup> | Optimum Tg <sup>3</sup> | Features   |
|--------------------|------------------------------|-------------------------------------|-------------------------|--|
| YDL 583 / TH 8283  | 10 -15                       | 2 / 100                             | 100 - 110               | Suitable for temperature sensitive processes, optional post curing |
| YDL 579/ TH 8270   | 40 – 50                      | 4 / 100                             | 110 - 130               | Moderate reactive system, suitable for standard RTM process        |
| YDL 583/ TH 8272_4 | 20 – 30                      | 4 / 140                             | 130 - 140               | One resin- two hardener system, enables productivity optimization  |
| YDL 564/ TH 7354   | 60 -70                       | 2/ 160                              | 160 - 180               | Moderately reactive, provides high thermal resistance              |

<sup>1</sup> @ 80 °C in minutes, <sup>2</sup> hours / °C, <sup>3</sup> Glass transition temperature °C

### Epotech systems for Sheet Molding Compound (S.M.C):

Systems designed for high volume production ability and excellent part reproducibility, provide long shelf life after maturation and eliminate need for using thixotropic agents needed for thickening as in conventional SMC. Cost effective option due to low labor requirements and ability to consolidate many parts into one.

| Epotech Grade   | Time to attain maturation <sup>1</sup> | Predicted Shelf life <sup>2</sup> | Optimum Tg <sup>3</sup> | Features  |
|-----------------|--|-----------------------------------|-------------------------|---|
| YD 570 /TH 7252 | 18 - 24                                | >30                               | 115-125                 | Solvent free Thixotropic system                                 |
| YD 143          | -<br>( on cooling)                     | > 60                              | 130-140                 | Single component system, long shelf life at ambient conditions. |

<sup>1</sup> in hours, <sup>2</sup> @ 20°C in days, <sup>3</sup> Glass transition temperature °C

### Epotech Expandable Epoxy Systems:

Suitable for Production of sandwich structures/ light weight panels and monolithic laminates possessing high mechanical strength & stiffness. Expandable epoxies are two component systems comprising of resin and hardener components which expand cure to provide densities (130-700 kg/m3). Processing to make composite sandwich panels involves combination of spray lay-up and compression molding and can be designed for short cycle times. Tooling can be designed to mold complex shapes. Closed cell enables low moisture absorption.

| Epotech Grade               | Laminate Density (kg/m3) |
|-----------------------------|--------------------------|
| YD 1107 D130-D150 / TH 7152 | 300-400                  |
| YD 1100 / TH 7152           | 450-550                  |
| YD 1106 D250 / TH 7161      | 550-650                  |
| YD 1106 D350 / TH 7161      | 700-780                  |
| YD 1106 D450 / TH 7161      | 850-900                  |

### Epotech Systems for Composite Cylinders:

Composite cylinders contribute significantly in reducing the fuel consumption and environmental footprint and increased safety compared to metal cylinders. Epotech Epoxy Systems for Composite cylinders are designed to provide safe, lighter, stronger and affordable solutions with exceptional mechanical strength and stiffness when used in combination with glass or carbon reinforcement.

| Epotech Grade     | Cure cycle <sup>1</sup> | Optimum Tg <sup>2</sup> | Features   |
|-------------------|-------------------------|-------------------------|--|
| YD 587 / TH 7257E | 1 / 90                  | 75 - 90                 | Room temperature cure system, designed exclusively for LPG cylinders       |
| YDL 549/ TH 7674  | 1/ 100                  | 115 - 125               | Elevated temperature cure system, suitable for LPG, CNG Type 3 and Type 4. |

<sup>1</sup> in hours/°C, <sup>2</sup> Glass transition temperature °C