

### Description

Simprex® M850 is an advanced vinyl ester prepreg with low styrene emission designed to provide a high performance-to-cost ratio.

Simprex® M850 has been designed for fast curing in compression molding. It can also be used with core materials such as Nomex® honeycomb, balsa and foams for sandwich structural parts using vacuum bag curing.

Simprex® M850 is a great choice for many applications in the range of low to medium service temperature.

### Physical Properties on E-Glass 7781

- Standard resin content: 40±3% by weight.
- Standard weight: 500±24 g/m<sup>2</sup>.
- Standard tack: medium.
- Cured ply thickness at 49% FVF: 0.24 mm.

### Typical Applications

- ✓ FRP parts for chemical resistance purposes.
- ✓ General-purpose composites.
- ✓ High performance sporting goods.

### Key Features and Benefits

#### • Prepreg

- ✓ Fast press curing: **8-20 min.**
- ✓ Shelf life: **12 months @ 70°F (21°C)**, and 24 months @ 41°F (5°C).
- ✓ Versatile curing temperature: 250-284°F (**121-140°C**).
- ✓ Suitable for low pressure: 1-3 bar.
- ✓ Self-adhesive for core materials and secondary bonding.
- ✓ Excellent flexibility and handling.
- ✓ Suitable for thin and thick laminates.

#### • Laminate

- ✓ Superior toughness.
- ✓ Excellent fatigue and impact resistance.
- ✓ Tg (DSC) up to 284°F (**140°C**).

### Cured Laminate Chemical Resistance

- ✓ Outstanding resistance to wide range of chemical such as:

| Chemicals           | Conc. (%) | T (°F/°C) |
|---------------------|-----------|-----------|
| Hydrochloric Acid   | ≤ 20      | 180/82    |
| Hydrobromic Acid    | ≤ 25      | 180/82    |
| Nitric Acid         | 5         | 150/65    |
| Nitric Acid Fumes   |           | 180/82    |
| Perchloric Acid     | 10        | 150/65    |
| Phthalic Acid       | All       | 210/99    |
| Barium Hydroxide    | All       | 150/65    |
| Calcium Hydroxide   | 100       | 210/99    |
| Potassium Hydroxide | ≤ 45      | 150/65    |
| Sodium Hydroxide    | All       | 180/82    |
| Jet Fuel            | 100       | 140/60    |
| Kerosene            | 100       | 180/82    |
| Gas, Natural        |           | 210/99    |
| Gasoline            | 100       | 180/99    |



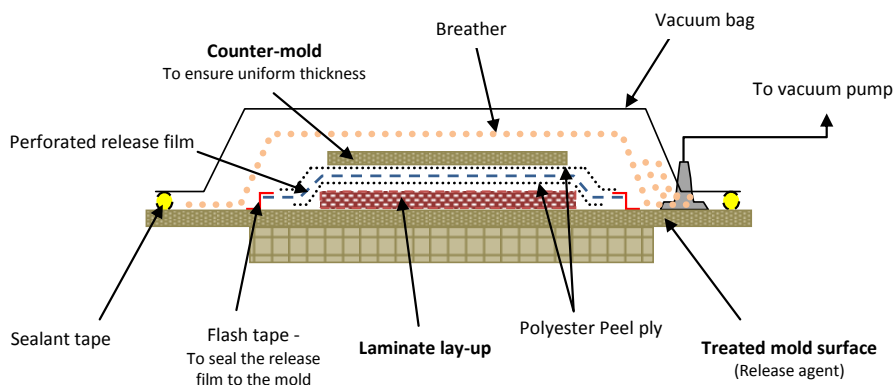
**Press Curing Cycle**

| Laminate Temp. (°F/°C) | Dwell Time (min.) | Dwell Pressure (bar/psi) | Suggested Pressure Releasing Temp. (°F/°C) |
|------------------------|-------------------|--------------------------|--|
| 250/120                | 20                | 1-3                      | < 80                                       |
| 257/125                | 15                | 1-3                      | < 85                                       |
| 266/130                | 12                | 1-3                      | < 90                                       |
| 275/135                | 10                | 1-3                      | < 95                                       |
| 284/140                | 8                 | 1-3                      | < 100                                      |

**Oven Vacuum Curing Cycle**

- Apply 24" Hg vacuum for 3-5 minutes before beginning heat cycle.
- Raise laminate temperature from room temperature to 250°F (120°C) within 30-45 min.
- Hold laminate at 250°F (**120°C**) for **20 min.**
- Cool the laminate to 176°F (80°C), at no more than 8°F/min, prior to release vacuum pressure.

**Recommended Bagging Arrangement**



❖ **In case Gel-coat is being used:**

- Apply 24" Hg vacuum for 3-5 minutes before beginning heat cycle.
- Raise laminate temperature from room temperature to 194°F (**90°C**) within 20-30 min.
- Hold laminate at 194°F (**90°C**) for **30 min.**
- Raise laminate temperature from 194°F (90°C) to 250°F (**120°C**).
- Hold laminate at 250°F (**120°C**) for **20 min.**
- Cool the laminate to 176°F (80°C), at no more than 8°F/min, prior to release vacuum pressure.



**Note down**

- ❖ It must be understood that the curing time starts only after the prepreg temperature achieves the recommended temperature. The **use of a thermocouple is a must** to monitor the actual prepreg temperature.
- ❖ In case of vacuum bag processing, one ply of lightweight breather, 120 gsm, is recommended. A heavyweight breather, 340 gsm, has to be used in case of Autoclave processing. In both cases, two or three additional layers of breather have to be applied locally beside the vacuum ports.

**Cured Laminates Mechanical Performance**

✓ Laminates cured @ 121°C for 20 min.

| <b>Mechanical Properties @ 25 °C</b> | <b>Reinforcement</b>         |        |                           |
|--------------------------------------|------------------------------|--------|---------------------------|
|                                      | <b>E-Glass 8H Satin 7781</b> |        | <b>12 K UD Stif. T700</b> |
| Curing Process                       | Press                        | Vacuum | Press                     |
| Fiber Areal Weight (gsm)             | 300                          | 300    | 320                       |
| Resin Content (%)                    | 33                           | 33     | 45                        |
| Fiber Volume Fraction (%)            | 48                           | 48     | 44                        |
| <b>0 ° Tensile,</b>                  |                              |        |                           |
| Strength, Mpa                        | 450                          | 430    | 1440                      |
| Ksi                                  | 65.3                         | 62.4   | 204                       |
| Modulus, Gpa                         | 22                           | 21     | 110                       |
| Msi                                  | 3.2                          | 3.0    | 16.0                      |
| ASTM D-3039                          |                              |        |                           |
| <b>0 ° Flexural,</b>                 |                              |        |                           |
| Strength, Mpa                        | 600                          | 550    | 1500                      |
| Ksi                                  | 87                           | 79.8   | 217.6                     |
| Modulus, Gpa                         | 24                           | 22     | 112                       |
| Msi                                  | 3.5                          | 3.2    | 16.2                      |
| ASTM D-790                           |                              |        |                           |
| <b>0 ° Compressive,</b>              |                              |        |                           |
| Strength, Mpa                        | 490                          | 470    | -                         |
| Ksi                                  | 71.1                         | 68.2   | -                         |
| ASTM D-695                           |                              |        |                           |
| <b>0 ° Interlaminar Shear,</b>       |                              |        |                           |
| Strength, Mpa                        | 50                           | 48     | 80                        |
| Ksi                                  | 7.3                          | 7.0    | 11.6                      |
| ASTM D-2344                          |                              |        |                           |



### Storage and Handling

All Simprex<sup>®</sup> prepregs are wrapped in a shrink film immediately after impregnation and then packed into a barrier film.

Simprex<sup>®</sup> prepregs should be stored in their original packaging barrier film, or an equivalent film, and maintained air-tightness, at 70°F (21°C) and dry place.

During storing and handling, the following notes must be considered:

- If the prepreg roll has to be maintained out of its packaging barrier film, for few hours during lamination and processing time, it should be wrapped up again in a shrink film. This will protect the prepreg and extend its out of the bag life time.
- The prepreg tack time out of the barrier packaging bag will be for several days, depending on the previous handling and protective caring.
- The release film must not be removed from the prepreg piece only when ready to be placed and laminated in the mold. The top release film must not be removed only when the following prepreg layer is ready to be placed. Such lamination care will ensure minimum styrene emission and working area highly environmentally friendly.
- It is highly recommended to handle the prepreg at a clean area where relative humidity is  $\leq 50\%$  and ambient temperature is 20-23°C.

### Safety Precautions

Usual precautions, as following, must be considered:

- During lamination, it is recommended to wear appropriate disposable protective gloves.
- Protective glasses must be worn to avoid eyes contamination. In case of contamination, eyes must be flushed for 15 min and then medical treatment must be applied.
- After working, hands and contaminated skin, if any, have to be washed with soap and warm water. This has to be implemented as a routine practice.

### Important Notice

The data reported in this sheet are based on representative samples. Since the method and circumstances of handling and processing are keys to the material performance, Gulf Composite Materials does not guaranty these data. Users should make their own assessment of the suitability of any product for the performance required.

