8 Fine-Blend™ POE-g-GMA

8.1 Fine-Blend™ SOG-02

Toughening Agent for PBT and Its Alloy

**Product Introduction**

Fine-Blend™ SOG-02 is a POE-g-GMA product, due to the reactivity of GMA higher than MAH, it can effectively improve the notch sensitivity of polyester material. The toughening efficiency of SOG-02 is same as imported agent (E-MA/BA-GMA), however, because of its unique molecular structure design, when used in polyester material, the former was better on processing fluidity, this can reduce processing defect of product and enhance productivity.

**Mechanism and Advantage**

GMA was grafted to the main chain of ethylene elastomer, so SOG-02 has high reactivity with the terminal carboxyl group of polyesters material; therefore, it can achieve the goal of increasing toughening and compatibility. Product structure diagram is as follows:

![Product Structure Diagram]

**Tab.8 the Physical and Chemical Properties of Fine-Blend™ SOG-02**

<table>
<thead>
<tr>
<th>Test item</th>
<th>Test Method</th>
<th>SOG-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (g/cm³)</td>
<td>ASTM D792</td>
<td>~0.88</td>
</tr>
<tr>
<td>^1MAH level (%)</td>
<td>Acid-base titration</td>
<td>Very High</td>
</tr>
<tr>
<td>^2MFR (g/10min)</td>
<td>ASTM D1238</td>
<td>2.0~5.0</td>
</tr>
<tr>
<td>Hardness (SHORE A)</td>
<td>ASTM D2240</td>
<td>70</td>
</tr>
</tbody>
</table>

Note: These are Physical and Chemical Properties only and are not to be construed as specifications.
1. Low <0.25%, Medium 0.25-0.5%, High 0.5-1.0%, Very High>1.0%

2. Test condition: 190°C, 2.16Kg

**Application Case**

**Case 1:** SOG-02 used in super toughening PBT has a higher liquidity

In toughening PBT, parallel adding SOG-02 with adding imported toughening agent, all of them can achieve super toughening effect when adding amount of 20%, however, the processability of the former is better.

**Case 2:** SOG-02 improved the impact strength of reinforced PBT

Fig.34 SOG-02 used in super toughening PBT has a higher liquidity

Fig.35 SOG-02 improved the impact strength of reinforced PBT
In reinforced PBT (30% glass fiber), adding 5% of SOG-02 and imported toughening agent, their toughening efficiency were similar.

**Case 3: SOG-02 improved the impact strength of flame-retardant reinforced PBT**

![Graph showing the impact strength comparison between Blank, 2wt% SOG-02, and 2wt% imported](image)

Fig.36 SOG-02 improved the impact strength of flame-retardant reinforced PBT

Notched impact strength increased more than 50% when adding 2% SOG-02 or imported toughening agent in flame-retardant reinforced PBT, in addition, the tensile strength decreased is not too much.

**Case 4: SOG-02 improved the strength of reinforced PC**

![Graph showing the tensile strength comparison between Blank, 5wt% SOG-02, and 5wt% imported](image)

Fig.37 SOG-02 improved the strength of reinforced PC
In reinforced PC (10% glass fiber), parallel adding 5% SOG-02 with adding 5% imported toughening agent, the former was better on impact strength and tensile strength.

**Case 5: SOG-02 used in PC/PBT alloy**

![Fig. 38 SOG-02 used in PC/PBT alloy](image)

In PC/PBT alloy (PC/PBT=7/3), parallel adding 5% SOG-02 with adding 5% imported toughening agent, the former was better on the notched impact and processing fluidity, therefore, SOG-02 has very obvious performance-price ratio.

Note: These are Physical and Chemical Properties only and are not to be construed as specifications.

**Recommended Dosage**

2-20%, can be adjusted according to the practical situation.

**Processing guidelines, package & storage and safety information**

Please refer to the product MSDS