Toyobo Develops Recyclable Coated Fabric for Airbags

Toyobo Co., Ltd. (Toyobo) has developed a new coated fabric for airbags that can be recycled. The product applies a newly developed nylon polymer in place of the silicone polymer used so far for side and side curtain airbags, which are increasing in recent years. The new coated fabric can be recycled without separating the coating material from the base fabric.

1. Development Background
   To date, Toyobo has primarily been involved with the manufacturing and sale of uncoated fabrics for driver and passenger frontal airbags. On the other hand, the number of car models equipped with side and side curtain airbags, to protect from side collisions, has been increasing in recent years. Manufacturers prefer to use coated fabrics with low air permeability for side and side curtain airbags due to the short distance between passengers and side doors. The demand for such fabrics is rising.

   However, recycling of silicone coated fabrics is difficult because of both technical and cost reasons. In many cases, the cut wastes generated in the manufacturing process are buried as industrial waste.

   Toyobo noted these market needs, and has developed a recyclable, low-cost coated fabric.

2. Features of the Recyclable Coated Fabric for Airbags
   (a) Recyclable without Separating Coating from Fabric

   The existing coated fabrics have generally used silicone as the coating material. Such fabrics are not only difficult to recycle, but the cost required to separate the silicone coating from the base fabric in the recycling process also becomes a problem.

   The new coated fabric developed by Toyobo can be recycled without separating the coating material from the base fabric because the newly developed nylon polymer is chemically friendly to the base fabric woven from Nylon-66 yarn.
(b) Coating Quantity Halved to Realize Lower Costs

Decreasing the amount of coating is one approach to lowering the costs of coated fabrics, but deterioration of fire-resistance and other problems occur when the amount of conventional silicone coating is decreased.

Combining the excellent yarn and fabric manufacturing technologies we have developed for driver and passenger frontal airbags with the newly developed nylon polymer coating, Toyobo has created a new coated fabric which uses less than half the coating amount of conventional silicone polymer coatings, with good fire-resistance and maintaining equivalent air permeability to existing coated fabrics.

<Comparison with Existing Coated Fabric (enlarged photographs)>

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<tr>
<th>Coated fabric using Toyobo’s newly developed nylon polymer coating</th>
<th>Coated fabric using conventional silicone polymer coating</th>
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3. Future Directions

Toyobo will now work to expand the use of this newly developed coated fabric for side and side curtain airbags to various automobile models and airbag components, together with the base fabric for driver and passenger frontal airbags the company has specialized in to date. Toyobo believes this new coated fabric can contribute toward the construction of a sustainable, cyclical-type society.

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[Supplement]

< Difference between Coated and Uncoated Fabrics>

Two types of fabrics are used for airbags: coated fabrics which normally have silicone coating material to reduce air permeability and permit a faster airbag deployment speed, and uncoated fabrics which have no coating applied.

Coated fabrics are used for side and side curtain airbags because the deployment speed of these airbags must be accelerated, since the distance to the passengers is relatively short.

In contrast, uncoated fabrics, which are generally allowed for lower deployment speeds than coated fabrics, are used for driver and passenger frontal airbags because the distance to the driver and front passenger is relatively long.