25% emission reduction
The results are striking: thanks to the lower belt weight and reduced rolling resistance, the Twaron and Sulfron belt achieves energy savings of 25% compared with the benchmark standard belt. What’s more, this is accompanied by significant savings in CO₂ emission. And this has more than just an environmental impact: due to the EU emission trading scheme (EU-ETS), CO₂ emissions also have a financial value.

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A rapid return on investment
Further financial assessment of the Twaron and Sulfron belt also shows a relatively quick investment payback time. This is based on the belt’s raw material costs and on the reductions it creates in energy use and CO₂ emissions.

Of course, the calculations refer to a specific belt installation with its own set of variables. For instance, the CO₂ emissions calculated here are based on an installation using coal-generated. For conveyor belts using other sources of power, the outcome of the calculations will differ somewhat.

However, the CBM tool can be adapted to any individual situation, and can help determine the optimal materials for use in your mining installation. Contact us to find out how Twaron and Sulfron can create a sustainable solution for you.

For more information, please e-mail us at conveyorbelt@teijinaramid.com or visit www.teijinaramid.com.

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High strength, low weight
Weight for weight, Twaron is five times stronger than steel and three times stronger than polyester (PET). This means that a Twaron-reinforced conveyor belt is considerably lighter than a belt with a conventional reinforcement like steel. As a result, less energy is required to drive the belt, leading to lower operating costs and less CO₂ emission.

At the same time, because the Twaron-reinforced belt is considerably lighter than a Twaron-reinforced conveyor belt is considerably

<table>
<thead>
<tr>
<th>Property</th>
<th>Steel</th>
<th>Twaron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (g/cm³)</td>
<td>7.85</td>
<td>1.44</td>
</tr>
<tr>
<td>Tenacity (MPa)</td>
<td>570</td>
<td>2500</td>
</tr>
<tr>
<td>Elongation at break (%)</td>
<td>2.2</td>
<td>1.9</td>
</tr>
</tbody>
</table>

The reduction in the overall number of belt splices ultimately makes belt installation faster and easier, translating into reduced capital expenditure.

Properties of Twaron straight warp fabric:
- Straight Twaron cords
- Transverse polyamide cords for additional weft strength and stiffness
- Thicker carcass
- Good impact and slit resistance

Properties of Twaron cord fabric:
- Straight Twaron cords
- Transverse binder threads
- Thinner carcass
- Good troughability and curveability

Measuring sustainability
In order to preserve natural resources, the world needs more sustainable product solutions. But how do you measure a product’s sustainability? Teijin Aramid has developed a special Customer Benefits Model (CBM) for conveyor belts. It is based on our own eco-efficiency analysis, and quantifies both the economic and environmental impact of different conveyor belt designs.

The CBM uses an existing (standard) steel-reinforced conveyor belt as a benchmark. The same belt is then redesigned – first, with a Sulfron rubber bottom layer, and secondly with a Sulfron rubber bottom layer and a Twaron carcass reinforcement. Then, all three are compared for relative levels of energy use, CO₂ emission and cost savings.

Reduced rolling resistance
Over half of a conveyor belt’s driving energy is lost in indentation rolling resistance of the belt. This is due to belt deformation when the belt passes over its support rollers. Sulfron reduces this effect by improving the hysteresis properties of the belt’s rubber, so that it runs more smoothly. This further reduces the energy needed to drive the belt.