Case Study Report

COMPARISON OF VIRGIN, SCRAP AND COMPOUNDED PP

Materials used:
- xxx Polypropylene, Virgin Material
- xxx Polypropylene Scrap Material

Tests Performed:
- Tensile Test with Universal Testing Machine
- Charpy notched Impact Strength with Pendulum Charpy
- Impact tester xxx Polypropylene Up-cycled Material by Graft Polymer

RESULTS

Virgin xxx PP

<table>
<thead>
<tr>
<th>Property</th>
<th>Yield Strength [Mpa]</th>
<th>Yield Strain [%]</th>
<th>Break Stress [%]</th>
<th>Break Strain [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>27.2</td>
<td>7.7</td>
<td>12.9</td>
<td>37.6</td>
</tr>
</tbody>
</table>

Charpy Notched Impact Strength

26.4 [kJ/m²]
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Scrap xxx PP

<table>
<thead>
<tr>
<th>Property</th>
<th>Yield Strength [Mpa]</th>
<th>Yield Strain [%]</th>
<th>Break Stress [%]</th>
<th>Break Strain [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>34.6</td>
<td>8.08</td>
<td>15.4</td>
<td>25.6</td>
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</tbody>
</table>

Charpy Notched Impact Strength
3.58 [kJ/m²]
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Up-Cycled xxx PP with Graft Polymer Modifier

<table>
<thead>
<tr>
<th>Property</th>
<th>Yield Strength [Mpa]</th>
<th>Yield Strain [%]</th>
<th>Break Stress [%]</th>
<th>Break Strain [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>28.01</td>
<td>9.76</td>
<td>15.23</td>
<td>42.26</td>
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</tbody>
</table>

Charpy Notched Impact Strength

22.1 [kJ/m²]
RESULTS COMPARISON

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Virgin</td>
<td>26.4</td>
<td>27.2</td>
<td>7.7</td>
<td>12.9</td>
<td>37.6</td>
</tr>
<tr>
<td>Scrap</td>
<td>3.58</td>
<td>34.6</td>
<td>8.08</td>
<td>15.4</td>
<td>25.6</td>
</tr>
<tr>
<td>Up-Cycled</td>
<td>22.1</td>
<td>28</td>
<td>9.76</td>
<td>15.2</td>
<td>42.3</td>
</tr>
</tbody>
</table>

Comparison of materials

![Graph comparing properties of different materials](image-url)
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PROPERTY OF THE UP-CYCLED MATERIAL AT DIFFERENT TEMPERATURES

Granules received from Up-Cycled material

Samples received from Up-Cycled material

Yield Stress  Yield Strain  Break Stress  Break Strain  Impact Strength

Virgin 230

180
190
200
230

0 5 10 15 20 25 30 35 40 45

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