Key acoustic applications at a glance

We deliver the right solution for every application, from acoustically transparent meshes providing first line protection for other components through to acoustic dampening meshes providing the highest Rayl values.

In comparison

Acoustic meshes AM – Acoustic meshes AM LR

With a range of sound dampening as well as acoustically transparent meshes, BOPP covers a comprehensive bandwidth from low to high MKS Rayl values.

Focus on applications

Our experience working closely with globally renowned manufacturers of premium acoustic products means we understand the constantly evolving and fast-changing challenges of these high tech markets. We know how important it is not just to continue to develop great products, but also to use innovative concepts to develop new methods. From the optimisation of acoustic performance, new approaches and other design elements through to particular protection for the surrounding components, we are the right partners with the innovative ideas.
BOPP – The advantages of our meshes

Acoustic meshes manufactured by BOPP bring together numerous advantages in comparison with other solutions. Find out for yourself and order samples; our Sales Managers are available to assist you on request.

Optimum buzzing and flapping reduction:
Our steel meshes eliminate unwanted interference triggered by vibrating materials within the speaker.

Durable:
Our stainless steel meshes are characterised by an extremely slow degradation process, especially when compared with other materials.

Precise:
Optimal accuracy and guaranteed reproducibility.

Reliable:
Minimal tolerances ensure total compliance with specific airflow resistance across the full surface of the mesh.

Stable:
Particularly high levels of robustness against external mechanical influences.

Weather resistant:
The alloys we use are all weather and corrosion resistant.

Flexible:
If you cannot find the right solution within our extensive portfolio, we can manufacture to individual customer specifications.

Electrostatic:
Unlike synthetic meshes, our steel mesh will not build up electrostatic charge, which simplifies further processing.

Documented:
Where required, every acoustic mesh specification can be supplied with the appropriate Rayl certification.

Varied Choice:
Incremental steps between individual specifications are extremely small, ensuring we have the right product for every application.

Microphone cover
Original size
BOPP – Additional Services

As well as enjoying an international reputation for the highest quality mesh products, BOPP also specialises in further processing its materials. Mesh is fabricated into finished components to individual customer specifications, which can then be integrated directly into your own manufacturing processes.

Coatings
Our coatings are designed to enhance performance whilst protecting against other external influences without altering the acoustic properties.

- Optimised processability
- Variable degrees of hardness and formability
- No loose wires
- Stress relieved annealing

Thermal Treatments
Using the processes listed below, mechanical material characteristics such as hardness, elasticity and formability can be optimised for further processing.

- Optimised processability
- Variable degrees of hardness and formability
- No loose wires
- Stress relieved annealing

Calendering (AM LR-Types)
- Strips or entire rolls
- Up to 35% reduction in thickness
- Variable gloss levels
- Surface structure properties
- Customer-specific realization

Partnerships
We can carry out further processing in partnership with various reputable converters worldwide known for work including:

- Insert molding
- Pressure sensitive adhesive strips
- Component assembly
- ...and many others

Engineering
We are happy to provide assistance with selecting the right mesh specification in terms of acoustic values, material properties, geometric form and component design using:

- Demand analyses
- Materials recommendations
- Design suggestions
- Technical drawings
- Cost calculations
- Production engineering

Fabrication
- Precision cutting & die cutting
  - Perfectly cut edges and angles
- Forming, bending, drawing and edge binding
- Welding, soldering, bonding
- Prototypes, one-offs
- Efficient volume production
- Process orientated packaging

Quality Control and Measurement
- Customer-specific quality checks
- Rayl measurements
- Production of measurement protocols
- Certification, records
- Frequency-dependent measurements

Coatings
Our coatings are designed to enhance performance whilst protecting against other external influences without altering the acoustic properties.

- Hydrophobic and oleophobic with HC8
  - Angle of contact up to 145°
  - Temperature resistance up to 200° C
- PVD-black

Partnerships
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- Certification, records
- Frequency-dependent measurements
BOPP – Product range
Acoustic Mesh AM

BOPP’s AM product range offers a comprehensive choice of acoustic dampening meshes to match a diverse range of requirements. Browse through the unparalleled and extremely consistent MKS Rayl values and tight tolerances.

<table>
<thead>
<tr>
<th>Mesh description</th>
<th>Specific air flow resistance @ (1,000 Pa) [MKS-Rayl]</th>
<th>Specific air flow resistance @ (30 Pa) [MKS-Rayl]</th>
<th>Air flow rate @ (30 Pa) [m³/s/cm²]</th>
<th>Hydrometric water column test</th>
<th>Relative flow area [%]</th>
<th>Absolute filter rating [µm]</th>
<th>Mesh thickness [mm]</th>
<th>Weight [kg/m²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM 20</td>
<td>20</td>
<td>25</td>
<td>118</td>
<td>280</td>
<td>Class C</td>
<td>14%</td>
<td>76</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 30</td>
<td>30</td>
<td>35</td>
<td>88</td>
<td>238</td>
<td>Class D</td>
<td>11%</td>
<td>59</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 40</td>
<td>40</td>
<td>46</td>
<td>69</td>
<td>194</td>
<td>Class D</td>
<td>10%</td>
<td>54</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 70</td>
<td>66</td>
<td>76</td>
<td>43</td>
<td>127</td>
<td>Class C</td>
<td>10%</td>
<td>48</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 90</td>
<td>90</td>
<td>98</td>
<td>33</td>
<td>103</td>
<td>Class C</td>
<td>12%</td>
<td>30</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 106</td>
<td>106</td>
<td>125</td>
<td>28</td>
<td>83</td>
<td>Class B</td>
<td>8%</td>
<td>41</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 130</td>
<td>127</td>
<td>149</td>
<td>23</td>
<td>71</td>
<td>Class B</td>
<td>15%</td>
<td>56</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 160</td>
<td>161</td>
<td>169</td>
<td>19</td>
<td>61</td>
<td>Class B</td>
<td>10%</td>
<td>28</td>
<td>0.17</td>
</tr>
<tr>
<td>AM 190</td>
<td>191</td>
<td>227</td>
<td>16</td>
<td>49</td>
<td>Class B</td>
<td>9%</td>
<td>43</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 220</td>
<td>211</td>
<td>257</td>
<td>14</td>
<td>44</td>
<td>Class B</td>
<td>7%</td>
<td>36</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 260</td>
<td>252</td>
<td>315</td>
<td>12</td>
<td>37</td>
<td>Class A</td>
<td>6%</td>
<td>33</td>
<td>0.26</td>
</tr>
<tr>
<td>AM 300</td>
<td>296</td>
<td>311</td>
<td>10</td>
<td>33</td>
<td>Class A</td>
<td>7%</td>
<td>19</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 340</td>
<td>348</td>
<td>365</td>
<td>9</td>
<td>29</td>
<td>Class A</td>
<td>7%</td>
<td>19</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 390</td>
<td>389</td>
<td>412</td>
<td>8</td>
<td>26</td>
<td>Class A</td>
<td>6%</td>
<td>17</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 420</td>
<td>425</td>
<td>449</td>
<td>7</td>
<td>23</td>
<td>Class A</td>
<td>6%</td>
<td>16</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 460</td>
<td>458</td>
<td>487</td>
<td>7</td>
<td>22</td>
<td>Class A</td>
<td>6%</td>
<td>16</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 500</td>
<td>497</td>
<td>529</td>
<td>6</td>
<td>20</td>
<td>Class A</td>
<td>5%</td>
<td>16</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 750</td>
<td>732</td>
<td>767</td>
<td>4</td>
<td>14</td>
<td>Class A</td>
<td>5%</td>
<td>13</td>
<td>0.15</td>
</tr>
<tr>
<td>AM 900</td>
<td>884</td>
<td>953</td>
<td>3</td>
<td>11</td>
<td>Class A</td>
<td>5%</td>
<td>13</td>
<td>0.15</td>
</tr>
</tbody>
</table>

• Absolute filter rating is determined using the bubble point test according to SAE/ARP 901.
• We reserve the right to make any necessary technical changes. Current information is always available on our website.
• Hydrostatic pressure test values given refer to meshes with an optional HC8 hydrophobic coating. BOPP uses hydrostatic pressure testing to illustrate the hydrophobic properties of our meshes. Providing data on IP ratings for individual meshes is not feasible as IP classification is only available on complete systems.
• Specific air flow resistance describes flow conditions dependent upon flow speed.
• MKS-Rayl For information on MKS-Rayl values, the specific air resistance is measured as the ratio of the differential pressure divided by the speed of laminar flow. Our standard tolerances for MKS Rayl values are a maximum of +/-12%.
• Customer specific meshes to defined specifications and in all formats can be produced on request.
BOPP – Product range
Acoustic Mesh AM LR

Acoustically transparent properties mean that our low Rayl value specifications impress not just in terms of sound quality but also protect against poke and the ingress of dust as well as creating a pleasing optical aesthetic for the finished components.

<table>
<thead>
<tr>
<th>Mesh description</th>
<th>Specific air flow resistance @ 30 Pa [MKS-Rayl]</th>
<th>Air flow rate @ 30 Pa (± 12 Pa) [l/min]</th>
<th>Hydrostatic water column test</th>
<th>Relative flow area [AORel %]</th>
<th>Aperture size [µm]</th>
<th>Mesh thickness [mm]</th>
<th>Weight [kg/m²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM LR 30</td>
<td>30.3</td>
<td>90</td>
<td>Class C</td>
<td>31%</td>
<td>40</td>
<td>0.06</td>
<td>0.17</td>
</tr>
<tr>
<td>AM LR 28</td>
<td>27.7</td>
<td>108</td>
<td>Class B</td>
<td>29%</td>
<td>42</td>
<td>0.07</td>
<td>0.20</td>
</tr>
<tr>
<td>AM LR 26</td>
<td>25.5</td>
<td>117</td>
<td>Class B</td>
<td>34%</td>
<td>40</td>
<td>0.06</td>
<td>0.20</td>
</tr>
<tr>
<td>AM LR 22</td>
<td>22.8</td>
<td>128</td>
<td>Class C</td>
<td>37%</td>
<td>56</td>
<td>0.08</td>
<td>0.17</td>
</tr>
<tr>
<td>AM LR 20</td>
<td>20.4</td>
<td>144</td>
<td>Class C</td>
<td>34%</td>
<td>50</td>
<td>0.07</td>
<td>0.18</td>
</tr>
<tr>
<td>AM LR 18</td>
<td>17.9</td>
<td>156</td>
<td>Class C</td>
<td>28%</td>
<td>67</td>
<td>0.12</td>
<td>0.34</td>
</tr>
<tr>
<td>AM LR 16</td>
<td>15.8</td>
<td>167</td>
<td>Class C</td>
<td>35%</td>
<td>90</td>
<td>0.13</td>
<td>0.31</td>
</tr>
<tr>
<td>AM LR 14</td>
<td>14.7</td>
<td>183</td>
<td>Class C</td>
<td>38%</td>
<td>80</td>
<td>0.10</td>
<td>0.24</td>
</tr>
<tr>
<td>AM LR 12</td>
<td>11.3</td>
<td>206</td>
<td>Class C</td>
<td>38%</td>
<td>104</td>
<td>0.13</td>
<td>0.30</td>
</tr>
<tr>
<td>AM LR 10</td>
<td>10.0</td>
<td>258</td>
<td>Class D</td>
<td>53%</td>
<td>67</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>AM LR 8</td>
<td>8.3</td>
<td>282</td>
<td>Class C</td>
<td>51%</td>
<td>90</td>
<td>0.07</td>
<td>0.12</td>
</tr>
<tr>
<td>AM LR 6</td>
<td>6.3</td>
<td>306</td>
<td>Class D</td>
<td>47%</td>
<td>140</td>
<td>0.13</td>
<td>0.24</td>
</tr>
<tr>
<td>AM LR 5</td>
<td>5.5</td>
<td>323</td>
<td>Class D</td>
<td>46%</td>
<td>160</td>
<td>0.15</td>
<td>0.29</td>
</tr>
<tr>
<td>AM LR 2</td>
<td>1.5</td>
<td>664</td>
<td>Class D</td>
<td>78%</td>
<td>224</td>
<td>0.06</td>
<td>0.04</td>
</tr>
</tbody>
</table>

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Overview Acoustic Mesh AM LR

![Graph showing specific air flow resistance](image-url)
BOPP – The right mesh for your application

To make your choice a little easier, in order to clarify the technical data we have created graphical representations from the tables to make the information more accessible.

- **MKS-Rayl in relation to absolute filter rating**
- **Hydrostatic water column categories**
- **Effect of a reduction in thickness on the Rayl value for AM LR specifications**
- **Mesh thickness compared with absolute filter rating**
Seven good reasons to choose BOPP

BOPP innovations are founded on decades of experience. Alongside exceptional product performance characteristics in the most diverse applications, we also impress in terms of our fundamental properties and attributes.

1. **Quality**
   We always maintain strict compliance with industry specific weaving standards. What’s more, we have created our own in-house standards alongside each of these, which demand far more than the officially accepted values in terms of challenges and tolerances.

2. **Experience**
   For many years, we have been working closely with renowned acoustics specialists, analysing applications and developing innovative solutions.

3. **Cost Efficiency**
   We continue to find new ways to increase our production efficiencies with a simultaneous increase in quality standards.

4. **Reproducibility**
   We maintain a process orientated approach to ensure optimum reproducibility.

5. **In-house Wire Drawing**
   We are the only fine wire weavers to operate our own fine wire drawing plant. This means we can ensure reliable delivery schedules and maintain quality procedures totally independent of third party input, in contrast with our competitors.

6. **Security**
   We manufacture in a trade-friendly and commercially stable environment, and are therefore able to guarantee average levels of product availability, supported by extensive stockholding. In addition, the BOPP Group operates three separate production facilities, providing higher levels of process security in the supply chain.

7. **Protecting the Environment**
   Our manufacturing plant complies with modern standards in terms of energy use and environmental sustainability. We are active participants in programmes to improve energy efficiency, and a member of Cleantech organisations.
The BOPP Group

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«THE ART OF SWISS PRECISION»