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Abstract
This standard provides rim speed limits for sheaves and sprockets based on typical construction and materials. Any rim speed above 6,500 feet per minute must be carefully considered.

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Foreword
This Foreword is provided for informational purposes only and is not to be construed to be part of any technical specification.

Suggestions for the improvement of, or comments on, this publication are welcome. They should be mailed to Mechanical Power Transmission Association, 5672 Strand Court, Suite 2, Naples, FL 34110 on your company letterhead.

Scope
This standard is intended to provide rotational velocity rim speed limits for industrial V-Belt sheaves and Synchronous belt sprockets. The products shall be of solid homogeneous materials with common design orientations. The information contained in this document is solely reflective of rotational speed capability for stresses imposed by centrifugal forces only. This standard does not consider the effects from belt interaction, operating conditions or specific part geometry.
Rim speed limits are dependent on a part’s construction and material properties. Table #1 provides the rim speed limit in feet per minute (FPM) for typical constructions and material grades.

The MPTA recommends guidance from the drive component manufacturer for all rim speeds exceeding 6,500 feet per minute.

Table #1: Rim Speed Limits

<table>
<thead>
<tr>
<th>Product Material</th>
<th>Minimum Ultimate Tensile Strength (psi)</th>
<th>Maximum Allowable RIM Speed Web/Arm Style (FPM)</th>
<th>Maximum Allowable RIM Speed Block Style (FPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 30 Gray Cast Iron (ASTM A-48)</td>
<td>30,000</td>
<td>6,500</td>
<td>7,500</td>
</tr>
<tr>
<td>Ductile Iron (65-45-12, ASTM A-536)</td>
<td>65,000</td>
<td>8,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Ductile Iron (80-55-06, ASTM A-536)</td>
<td>80,000</td>
<td>10,000</td>
<td>13,000</td>
</tr>
<tr>
<td>Aluminum (6061T6)</td>
<td>44,000</td>
<td>N/A</td>
<td>18,000</td>
</tr>
<tr>
<td>Steel (1018)</td>
<td>55,000</td>
<td>9,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Steel (1144)</td>
<td>95,000</td>
<td>16,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

In order to convert rim speed from FPM to RPM, use Formula #1.

Formula #1:

\[
RPM = \text{Rim Speed (FPM)} / 0.262 \times \text{Outside Diameter (in)}
\]

For high-speed applications dynamic balancing may be desired for optimal drive operation. However, regardless of the balance grade specified, the rim speed limits above are still in effect. Further information on balancing can be found in MPTA-B2c.

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