Equivalent Area / TW
TransPowr® TW conductors utilize aluminum strands that are shaped to provide a smooth outer surface and fit together to allow a smaller overall diameter of the conductor. Compared to a conventional conductor with the same aluminum cross-sectional area, the TransPowr® TW product is approximately 10% smaller in diameter. The smaller diameter enables reduced ice loads and lower wind loading parameters. The individual wires are pre-shaped prior to stranding so they fit together to reduce the interstitial empty spaces.

Equivalent Diameter / TW
At an alternative, TransPowr® TW conductors are available with an “overall conductor diameter equivalence” to a conventional conductor. In this case, an equal diameter TransPowr® TW gains a 20-23% increase in aluminum area. This increased cross-sectional area significantly decreases the conductor resistance and increases the current-carrying capacity of the transmission line. Instead of manufacturing a smaller diameter conductor for the “equivalent” circular area, the design of the trapezoidal shapes can be enlarged to yield a greater cross-sectional area of aluminum and match the diameter of the original conventional round conductor.

TW Conductor Designs
TransPowr® TW conductors are manufactured to one of the following applicable ASTM standards: ASTM B778, B779, or B837. These published ASTM standards provide the construction basis for a large selection of trapezoidal conductor designs. Additional TransPowr® TW conductor designs are also available and are built to specific customer requirements. TransPowr® ACSR/TW and ACSS/TW conductors are available with aluminum-clad steel, regular, high-strength, extra-high-strength and ultra-high-strength galvanized or zinc-aluminum-mischmetal alloy-coated core materials. TransPowr® AAC/TW conductors are also available utilizing 6101-T83 alloy aluminum.

Design Option #1: Equivalent Area - Smaller Overall Diameter
The conductor illustration on the far left is an example of an “equivalent area” TransPowr® TW trapezoidal conductor that has the same aluminum cross-sectional area as the conventional conductor on the right, but with a smaller overall diameter. The smaller diameter means lower ice and wind loading factors. This enables a reduction in the design strength requirements for the towers and poles, which for new line construction will save money in construction costs. The “equivalent area” TW conductor is approximately 10% smaller in OD.

Design Option #2: Equivalent Diameter - More kcmil Area of Aluminum
The conductor illustration on the far left is an example of an “equivalent diameter” TransPowr® TW trapezoidal conductor that has the same diameter as the conventional conductor on the right, but with a much larger aluminum cross-sectional area. You can increase the aluminum content by 20-25%, decrease the AC resistance by 15-20% and significantly increase the current-carrying capacity of the line. “Equivalent diameter” TW conductors can provide energy-saving advantages for consideration in reconductoring projects.

BICC® BRAND TransPowr® TW conductors are available to complement the diverse line of bare overhead conductors that General Cable manufactures. General Cable has developed the trapezoidal compact TW conductors to offer our customers additional options in transmission line design. General Cable offers AAC/TW, ACSR/TW, ACSS/TW and AAAC/TW conductor constructions.

Physical and Electrical Comparisons

Design Option #1: Equivalent Area - Smaller Overall Diameter
The conductor illustration on the far left is an example of an “equivalent area” TransPowr® TW trapezoidal conductor that has the same aluminum cross-sectional area as the conventional conductor on the right, but with a smaller overall diameter. The smaller diameter means lower ice and wind loading factors. This enables a reduction in the design strength requirements for the towers and poles, which for new line construction will save money in construction costs. The “equivalent area” TW conductor is approximately 10% smaller in OD.

Design Option #2: Equivalent Diameter - More kcmil Area of Aluminum
The conductor illustration on the far left is an example of an “equivalent diameter” TransPowr® TW trapezoidal conductor that has the same diameter as the conventional conductor on the right, but with a much larger aluminum cross-sectional area. You can increase the aluminum content by 20-25%, decrease the AC resistance by 15-20% and significantly increase the current-carrying capacity of the line. “Equivalent diameter” TW conductors can provide energy-saving advantages for consideration in reconductoring projects.

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Physical and Electrical Comparisons

Design Option #1: Equivalent Area - Smaller Overall Diameter
The conductor illustration on the far left is an example of an “equivalent area” TransPowr® TW trapezoidal conductor that has the same aluminum cross-sectional area as the conventional conductor on the right, but with a smaller overall diameter. The smaller diameter means lower ice and wind loading factors. This enables a reduction in the design strength requirements for the towers and poles, which for new line construction will save money in construction costs. The “equivalent area” TW conductor is approximately 10% smaller in OD.

Design Option #2: Equivalent Diameter - More kcmil Area of Aluminum
The conductor illustration on the far left is an example of an “equivalent diameter” TransPowr® TW trapezoidal conductor that has the same diameter as the conventional conductor on the right, but with a much larger aluminum cross-sectional area. You can increase the aluminum content by 20-25%, decrease the AC resistance by 15-20% and significantly increase the current-carrying capacity of the line. “Equivalent diameter” TW conductors can provide energy-saving advantages for consideration in reconductoring projects.

BICC® BRAND TransPowr® TW conductors are available to complement the diverse line of bare overhead conductors that General Cable manufactures. General Cable has developed the trapezoidal compact TW conductors to offer our customers additional options in transmission line design. General Cable offers AAC/TW, ACSR/TW, ACSS/TW and AAAC/TW conductor constructions.

Physical and Electrical Comparisons
Equivalent Area / TW

TransPowr® TW conductors utilize aluminum strands that are shaped to provide a smooth outer surface and fit together to allow a smaller overall diameter of conductor. Compared to a conventional conductor with the same aluminum cross-sectional area, the TransPowr® TW product is approximately 10% smaller in diameter. The smaller diameter enables reduced ice loads and lower wind loading parameters. The individual wires are pre-shaped prior to stranding so they fit together to reduce the interstitial empty spaces.

Equivalent Diameter / TW

As an alternative, TransPowr® TW conductors are available with an “overall conductor diameter equivalence” to a conventional conductor. In this case, the equal diameter TransPowr® TW gains a 20-25% increase in aluminum area. This increased cross-sectional area significantly decreases the conductor resistance and increases the current-carrying capacity of the transmission line. Instead of manufacturing a smaller diameter conductor for the “equivalent” circular mil area, the design of the trapezoidal shapes can be enlarged to yield a greater cross-sectional area of aluminum and match the diameter of the original conventional round conductor.

Trapezoidal Conductor Designs

TransPowr® TW conductors are manufactured to one of the following applicable ASTM standards: ASTM B778, B779, or B837. These published ASTM standards provide the construction basis for a large selection of trapezoidal conductor designs. Additional TransPowr® TW conductor designs are also available and are built to specific customer requirements. TransPowr® ACSR/TW and ACS/TW conductors are available with aluminum-clad steel, regular, high-strength, extra-high-strength and ultra-high-strength galvanized or zinc-aluminum mischmetal alloy-coated steel core materials. TransPowr® AAAC/TW conductors are also available utilizing 6101-T83 alloy aluminum.

Design Option #1: Equivalent Area - Smaller Overall Diameter

The conductor illustration on the far left is an example of an “equivalent area” TransPowr® TW trapezoidal conductor that has the same aluminum cross-sectional area as the conventional conductor on the right, but with a smaller overall diameter. The smaller diameter means lower ice and wind loading factors. This enables a reduction in the design strength requirements for the towers and poles, which for new line construction will save money in construction costs. The “equivalent area” TW conductor is approximately 10% smaller in OD.

Design Option #2: Equivalent Diameter - More kcmil Area of Aluminum

The conductor illustration on the far left is an example of an “equivalent diameter” TransPowr® TW trapezoidal conductor that has the same diameter as the conventional conductor on the right, but with a much larger aluminum cross-sectional area. You can increase the aluminum content by 20-25%, decrease the AC resistance by 15-20% and significantly increase the current-carrying capacity of the line. “Equivalent diameter” TW conductors can provide energy-saving advantages for consideration in reconductoring projects.

Physical and Electrical Comparisons

<table>
<thead>
<tr>
<th>Conductor</th>
<th>Area</th>
<th>Stranding</th>
<th>Steel</th>
<th>OD (in.)</th>
<th>Max (WAT)</th>
<th>Rating (lbs/kft)</th>
<th>Type</th>
<th>Conductivity of Aluminum</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARDINAL ACSR</td>
<td>954</td>
<td>54/7</td>
<td>7 in. 0.1329”</td>
<td>1.26”</td>
<td>3244</td>
<td>36,000</td>
<td>13</td>
<td>61.2% IACS</td>
</tr>
<tr>
<td>CARDINAL ACSR</td>
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<td>21/7</td>
<td>7 in. 0.1329”</td>
<td>1.08”</td>
<td>1224</td>
<td>26,000</td>
<td>13</td>
<td>63.0% IACS</td>
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<tr>
<td>CARDINAL ACSR/TW</td>
<td>954</td>
<td>54/7</td>
<td>7 in. 0.1329”</td>
<td>1.26”</td>
<td>3244</td>
<td>33,500</td>
<td>13</td>
<td>61.2% IACS</td>
</tr>
<tr>
<td>CARDINAL ACSS/TW</td>
<td>954</td>
<td>54/7</td>
<td>7 in. 0.1329”</td>
<td>1.26”</td>
<td>3244</td>
<td>33,500</td>
<td>13</td>
<td>61.2% IACS</td>
</tr>
<tr>
<td>HUDSON ACSR/TW</td>
<td>1158.4</td>
<td>20/7</td>
<td>7 in. 0.1307”</td>
<td>1.26”</td>
<td>4980</td>
<td>33,500</td>
<td>13</td>
<td>61.2% IACS</td>
</tr>
</tbody>
</table>

Cardinal ACSR/TW

- The conductor illustration on the left is an example of an “equivalent area” TransPowr® TW trapezoidal conductor that has the same aluminum cross-sectional area as the conventional conductor on the right, but with a much larger aluminum cross-sectional area. You can increase the aluminum content by 20-25%, decrease the AC resistance by 15-20% and significantly increase the current-carrying capacity of the line. “Equivalent diameter” TW conductors can provide energy-saving advantages for consideration in reconductoring projects.

General Cable now offers:
- BICC® Brand TransPowr® ACSR/TW
- BICC® Brand TransPowr® AAAC/TW
- BICC® Brand TransPowr® ACSS/TW

Contact your General Cable sales representative to find out more details about the TW trapezoidal overhead conductor products.