Adina cordifolia
Family: Rubiaceae
Haldu
Kwao

Other Common Names: Hnaw (Burma), Kwao, Kwow, Kan-luang (Thailand), Kovao, Gao (Cambodia).

Distribution: India, Ceylon, Thailand, and Burma; scattered in mixed deciduous forests.

The Tree: A large tree reaching a height of 100 ft with trunk diameters of 4 to 5 ft; long, straight, fluted stem which is sometimes buttressed.

The Wood:
General Characteristics: Heartwood yellow when freshly cut, turning pale yellowish reddish brown on exposure; not sharply demarcated from the yellowish-white rather thick sapwood. Lustrous; fairly straight-grained but sometimes interlocked; texture fine and even; without distinctive odor or taste.

Weight: Basic specific gravity (ovendry weight/green volume) varies from 0.54 to 0.63, depending on source; air-dry density 41 to 48 pcf.

Mechanical Properties: (First set of values based on the 2-in. standard, second set on the 2-cm standard.)

<table>
<thead>
<tr>
<th>Moisture content</th>
<th>Bending strength (Psi)</th>
<th>Modulus of elasticity (1,000 psi)</th>
<th>Maximum crushing strength (Psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15% (47)</td>
<td>12,230</td>
<td>1,340</td>
<td>6,040</td>
</tr>
<tr>
<td>12% (51)</td>
<td>13,000</td>
<td>NA</td>
<td>8,600</td>
</tr>
</tbody>
</table>

Janka side hardness 1,140 lb at 15% moisture content. Amsler toughness 133 in.-lb. 12% moisture content (2-cm specimen).

Drying and Shrinkage: Some tendency to check and split in air drying; otherwise reported to season fairly well. Kiln schedule T6-D2 is suggested for 4/4 stock and T3-D1 for 8/4. Shrinkage green to ovendry: radial 3.4%; tangential 6.8%. Reported to have a large movement in service.

Working Properties: Easy to work with hand and machine tools; turns well; takes a very fine and smooth finish.

Durability: Reports vary from moderately durable to nondurable.

Preservation: No information available.
Uses: Joinery, turnery, furniture, decorative paneling, bobbins, flooring.

Additional Reading: (17), (47), (51)
