Double wall copper tube tank heaters are designed for heating potable water with either potable, non-potable liquids, or gases or vapors.

**DESIGN AND CONSTRUCTION FEATURES**

Tank heating units are used for heating water and are specifically engineered for installation in A. O. Smith Model "HD" series custom lined storage tanks or in large volume commercial electric water heaters. Models DVE and DHE for dual energy applications.

Heating units are manufactured with a smooth copper tube within a grooved copper tube. Tubing is seamless copper. Outer tube is 3/4" OD. Coil assembly includes ASME approved collar, cast iron head, stainless steel spacer(s), (2) stainless steel tube sheets with atmospheric vent between, (specify non-ferous tube sheet(s) if desired), (2) gaskets, bolts, nuts, and tube supports as required.

Heating units are designed and constructed in accordance with the ASME code for 125 to 150 PSI working pressure for use in potable water heaters and tanks.

Heating units have a positive visible fail-safe means of leak detection in the event of either tube failure to prevent mixture of heating medium and potable water.

**EXPLANATION OF MODEL NUMBERS**

Example: DW 6-24

DW = double wall liquid water
6 = diameter of tube bundle in inches
24 = length of tube bundle in inches

**SELECTION**

For the best performance, tank heating units should extend into the tank as far as possible.

In Table A, minimum flow rates are given for both a 100% water solution and a 50%-50% water glycol solution. These flow rates will assure a liquid turbulent flow in the tubes.

**ASME CODE CONSTRUCTION & REGISTRATION**

Heat exchangers are constructed in accordance to ASME Section VIII, Div. 1 requirements. A Manufacturer's Partial Data Report for Pressure Vessels, Form U-2, is furnished with each Type "DW" unit upon request. These forms are signed by an authorized inspector, holding a National Board Commission, who is employed by an authorized inspection agency, certifying that construction conforms to the latest ASME Code for pressure vessels. In addition, each "DW" unit is registered with the National Board of Boiler and Pressure Vessel Inspectors.
TABLE B TANK COIL RECOVERY DATA (Various Temperature Rises)

HOW TO SIZE TABLE B

1. Locate the temperature rise desired in left-hand column.
2. Move to the right, to the column labeled with the appropriate boiler water inlet temperature (at 10° to 20° drop). This figure represents the recovery capacity of 1 sq. ft. of heating surface.
3. Divide the total GPH of the installation by the recovery of 1 sq. ft. to determine the number of sq. ft. required.
4. Select the coil with adequate sq. ft. of heating surface from table A. In most cases, more than one coil will meet the system requirements. Maximum efficiency for hot water coils will normally be obtained when the coil extends into the tank as far as possible (minimum of halfway required).
5. Boiler water flow rate must be greater than the minimum required for the coil, however must not exceed the maximum shown in table A.

To determine the boiler water flow rate, multiply the total GPH requirement by the temperature rise. Divide this quantity by 60 times the appropriate boiler water temperature drop of 10° or 20° (600 or 1200).

Example: 150 GPH required at 140° outlet with inlet of 40°F (temperature rise equal to 100). Boiler water temperature of 200°F with a 20° drop (180°F outlet). Table B indicates 14 GPH/sq. ft., therefore, divide 150 GPH by 14 GPH/sq. ft. which gives you 10.7 sq. ft. of heating surface required. To determine the flow rate of the boiler water, multiply 150 GPH x 100° rise and divide by 60 x 20° drop = 12.5 GPM. This will allow you to select a DW 4-96 w/12.0 sq. ft. or DW 6-36 w/12.7 sq. ft.

Vertical tank: Maximum coil length determined by tank diameter.
Horizontal tank: Maximum coil length determined by tank length.

NOTE: The heat transfer rate can be drastically reduced with age and build-up of scale. Thus, consideration should be given to fouling factors and the square footage increased accordingly, in hard water areas. The recovery capacity (GPH/sq. ft.) already includes a .001 fouling factor for average water conditions.

TABLE C DIMENSIONS

<table>
<thead>
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<tbody>
<tr>
<td>4&quot;</td>
<td>150</td>
<td>300</td>
<td>Head Tube Shts.</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>300</td>
<td>4/12</td>
<td>9</td>
<td>1 1/4</td>
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<tr>
<td>6&quot;</td>
<td>150</td>
<td>300</td>
<td>Cast Iron Bonnet</td>
<td>Copper</td>
<td>Stainless Steel</td>
<td>Carbon Steel</td>
<td>300</td>
<td>6 5/8</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>150</td>
<td>300</td>
<td>Welded</td>
<td></td>
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<td></td>
<td></td>
<td>300</td>
<td>8 5/8</td>
<td>13</td>
<td>1/2</td>
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<tr>
<td>10&quot;</td>
<td>125+250 (2P) 300 (4P)</td>
<td>300</td>
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<td></td>
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<td></td>
<td></td>
<td>300</td>
<td>10 3/4</td>
<td>16</td>
<td>3</td>
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<tr>
<td>12&quot;</td>
<td>125+250 (2P) 300 (4P)</td>
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<td></td>
<td>300</td>
<td>12 3/4</td>
<td>19</td>
<td>4&quot; Flange</td>
</tr>
</tbody>
</table>

* 150 lb. cast iron heads available on special order.

1. Tankside tube sheet is Stainless Steel. Tube Side tube sheet is Carbon Steel.
2. Both inner and outer tubes are copper.