Office of Asst. Sec. for Housing, HUD

§ 3280.705 Gas piping systems.

(a) General. The requirements of this section shall govern the installation of all fuel gas piping attached to any manufactured home. The gas piping supply system shall be designed for a pressure not exceeding 14 inch water column (¼ psi) and not less than 7 inch water column (¼ psi). The manufacturer shall indicate in his written installation instructions the design pressure limitations for safe and effective operation of the gas piping system. None of the requirements listed in this section shall apply to the piping supplied as a part of an appliance. All exterior openings around piping, ducts, plenums or vents shall be sealed to resist the entrance of rodents.

(b) Materials. All materials used for the installation, extension, alteration, or repair of any gas piping system shall be new and free from defects or internal obstructions. It shall not be permissible to repair defects in gas piping or fittings. Inferior or defective materials shall be removed and replaced with acceptable material. The system shall be made of materials having a melting point of not less than 1,450 °F, except as provided in §3280.705(e). They shall consist of one or more of the materials described in §3280.705(b)(1) through (4).

(1) Steel or wrought-iron pipe shall comply with ANSI Standard B36.10–1979, Welded and Seamless Wrought Steel Pipe. Threaded brass pipe in iron pipe sizes may be used. Threaded brass pipe shall comply with ASTM B43–91, Standard Specification for Seamless Red Brass Pipe, Standard Sizes.

(2) Fittings for gas piping shall be wrought iron, malleable iron, steel, or brass (containing not more than 75 percent copper).

(3) Copper tubing must be annealed type, Grade K or L, conforming to the Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Service, ASTM B280–1995. Copper tubing must be internally tinned.

(4) Steel tubing must have a minimum wall thickness of 0.032 inch for tubing of ½ inch diameter and smaller and 0.049 inch for diameters ½ inch and larger. Steel tubing must be in accordance with ASTM Standard Specification for Electric-Resistance-Welded Coiled Steel Tubing for Gas and Fuel
188

Oil Lines, ASTM A539–1999, and must be externally corrosion protected.

(c) Piping design. Each manufactured home requiring fuel gas for any purpose shall be equipped with a natural gas piping system acceptable for LP-gas. Where fuel gas piping is to be installed in more than one section of an expandable or multiple unit home, the design and construction of the crossover(s) shall be as follows:

(1) All points of crossover shall be readily accessible from the exterior of the home.

(2) The connection(s) between units must be made with a connector(s) listed for exterior use or direct plumbing sized in accordance with §3280.705(d). A shutoff valve of the non-displaceable rotor type conforming to ANSI Z21.15–1997, Manually Operated Gas Valves for Appliances, Appliances Connector Valves, and Hose End Valves, suitable for outdoor use must be installed at each crossover point upstream of the connection.

(3) The connection(s) may be made by a listed quick disconnect device which shall be designed to provide a positive seal of the supply side of the gas system when such device is separated.

(4) The flexible connector, direct plumbing pipe, or “quick disconnect” device shall be provided with protection from mechanical and impact damage and located to minimize the possibility of tampering.

(5) For gas line cross over connections made with either hard pipe or flexible connectors, the crossover point(s) shall be capped on the supply side to provide a positive seal and covered on the other side with a suitable protective covering.

(6) Suitable protective coverings for the connection device(s) when separated, shall be permanently attached to the device or flexible connector.

(7) When a quick disconnect device is installed, a 3 inch by 1/4 inch minimum size tag made of etched, metal-stamped or embossed brass, stainless steel, anodized or alcalde aluminum not less than 0.020 inch thick or other approved material (e.g., 0.005 inch plastic laminates) shall be permanently attached on the exterior wall adjacent to the access to the “quick disconnect” device. Each tag shall be legibly inscribed with the following information using letters no smaller than 1/4 inch high:

Do Not Use Tools To Separate the “Quick-Disconnect” Device

(d) Gas pipe sizing. Gas piping systems shall be sized so that the pressure drop to any appliance inlet connection from any gas supply connection, when all appliances are in operation at maximum capacity, is not more than 0.5 inch water column as determined on the basis of test, or in accordance with table §3280.705(d). When determining gas pipe sizing in the table, gas shall be assumed to have a specific gravity of 0.65 and rated at 1000 B.T.U. per cubic foot. The natural gas supply connection(s) shall be not less than the size of the gas piping but shall be not smaller than 3/4 inch nominal pipe size.

(e) Joints for gas pipe. All pipe joints in the piping system, unless welded or brazed, shall be threaded joints that comply with Pipe Threads, General Purpose (Inch), adopted 25 October 1984, ANSI/ASME B1.20.1–1983. Right and left nipples or couplings shall not be used. Unions, if used, shall be of ground joint type. The material used for welding or brazing pipe connections shall have a melting temperature in excess of 1,000 F.

(f) Joints for tubing. (1) Tubing joints shall be made with either a single or a double flare of 45 degrees in accordance with Flares For Tubing, SAE-J533b-1972 or with other listed vibration-resistant fittings, or joints may be brazed with material having a melting point exceeding 1,000 F. Metallic ball sleeve compression-type tubing fittings shall not be used.

(2) Steel tubing joints shall be made with a double-flare in accordance with Flares For Tubing, SAE-J533b-1972.

(g) Pipe joint compound. Screw joints shall be made up tight with listed pipe joint compound, insoluble in liquefied petroleum gas, and shall be applied to the male threads only.

(h) Concealed tubing. Tubing shall not be run inside walls, floors, partitions, or roofs. Where tubing passes through walls, floors, partitions, roofs, or similar installations, such tubing shall be protected by the use of weather resistant grommets that shall snugly fit
both the tubing and the hole through which the tubing passes.
<table>
<thead>
<tr>
<th>I.D.</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>⅛&quot;</td>
<td>43</td>
<td>29</td>
<td>24</td>
<td>20</td>
<td>18</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>⅜&quot;</td>
<td>155</td>
<td>120</td>
<td>97</td>
<td>82</td>
<td>73</td>
<td>66</td>
<td>61</td>
<td>57</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td>½&quot;</td>
<td>360</td>
<td>250</td>
<td>200</td>
<td>170</td>
<td>151</td>
<td>138</td>
<td>125</td>
<td>118</td>
<td>110</td>
<td>103</td>
</tr>
<tr>
<td>1&quot;</td>
<td>840</td>
<td>565</td>
<td>465</td>
<td>400</td>
<td>350</td>
<td>320</td>
<td>300</td>
<td>280</td>
<td>270</td>
<td>250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O.D.</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>⅛&quot;</td>
<td>27</td>
<td>18</td>
<td>15</td>
<td>13</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>⅜&quot;</td>
<td>56</td>
<td>38</td>
<td>31</td>
<td>26</td>
<td>23</td>
<td>21</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>½&quot;</td>
<td>113</td>
<td>78</td>
<td>62</td>
<td>53</td>
<td>47</td>
<td>43</td>
<td>39</td>
<td>37</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>¾&quot;</td>
<td>197</td>
<td>136</td>
<td>109</td>
<td>93</td>
<td>83</td>
<td>75</td>
<td>69</td>
<td>64</td>
<td>60</td>
<td>57</td>
</tr>
<tr>
<td>1&quot;</td>
<td>280</td>
<td>190</td>
<td>155</td>
<td>132</td>
<td>117</td>
<td>106</td>
<td>99</td>
<td>91</td>
<td>85</td>
<td>81</td>
</tr>
</tbody>
</table>
Office of Asst. Sec. for Housing, HUD § 3280.705

PART II [RESERVED]

(i) Concealed joints. Piping or tubing joints shall not be located in any floor, wall partition, or similar concealed construction space.

(j) Gas supply connections. When gas appliances are installed, at least one gas supply connection shall be provided on each home. The connection shall not be located beneath an exit door. Where more than one connection is provided, the piping system shall be sized to provide adequate capacity from each supply connection.

(k) Identification of gas supply connections. Each manufactured home shall have permanently affixed to the exterior skin at or near each gas supply connection or the end of the pipe, a tag of 3 inches by 1 3/16 inches minimum size, made of etched, metal-stamped or embossed brass, stainless steel, anodized or alcalde aluminum not less than 0.020 inch thick, or other approved material (e.g., 0.005 inch plastic laminates), which reads as follows. The connector capacity indicated on this tag shall be equal to or greater than the total Btuh rating of all intended gas appliances.

COMBINATION LP-GAS AND NATURAL GAS SYSTEM

This gas piping system is designed for use of either liquefied petroleum gas or natural gas.

NOTICE: BEFORE TURNING ON GAS BE CERTAIN APPLIANCES ARE DESIGNED FOR THE GAS CONNECTED AND ARE EQUIPPED WITH CORRECT ORIFICES. SECURELY CAP THIS INLET WHEN NOT CONNECTED FOR USE.

When connecting to lot outlet, use a listed gas supply connector for mobile homes rated at □ 100,000 Btuh or more; □ 250,000 Btuh or more.

Before turning on gas, make certain all gas connections have been made tight, all appliance valves are turned off, and any unconnected outlets are capped.

After turning on gas, test gas piping and connections to appliances for leakage with soapy water or bubble solution, and light all pilots.

The connector capacity indicated on this tag shall be equal to or greater than the total Btuh rating of all intended gas appliances.

(l) LP-gas supply connectors. (1) A listed LP-Gas flexible connection conforming to UL 569-1995, Pigtails and Flexible Hose Connectors for LP Gas, or equal must be supplied when LP-Gas cylinders(s) and regulator(s) are supplied.

(2) Appliance connections. All gas burning appliances shall be connected to the fuel piping. Materials as provided in §3280.705(b) or listed appliance connectors shall be used. Listed appliance connectors when used shall not run through walls, floors, ceilings or partitions, except for cabinetry, and shall be 3 feet or less in length or 6 feet or less for cooking appliances. Connectors of aluminum shall not be used outdoors. A manufactured home containing a combination LP-natural-gas system may be provided with a gas outlet to supply exterior appliances when installed in accordance with the following:

(i) No portion of the completed installation shall project beyond the wall of the manufactured home.

(ii) The outlet must be provided with an approved quick-disconnect device, which must be designed to provide a positive seal on the supply side of the gas system when the appliance is disconnected. A shutoff valve of the non-displaceable rotor type conforming to ANSI Z21.15–1997, Manually Operated Gas Valves, must be installed immediately upstream of the quick-disconnect device. The complete device must be provided as part of the original installation.

(iii) Protective caps or plugs for the “quick-disconnect” device, when disconnected, shall be permanently attached to the manufactured home adjacent to the device.

(iv) A tag shall be permanently attached to the outside of the exterior wall of the manufactured home as close as possible to the gas supply connection. The tag shall indicate the type of gas and the Btuh capacity of the outlet and shall be legibly inscribed as follows:

THIS OUTLET IS DESIGNED FOR USE WITH GAS PORTABLE APPLIANCES WHOSE TOTAL INPUT DO NOT EXCEED ___ BTUH. REPLACE PROTECTIVE COVERING OVER CONNECTOR WHEN NOT IN USE.
§ 3280.706 Oil piping systems.

(a) General. The requirements of this section shall govern the installation of all liquid fuel piping attached to any manufactured home. None of the requirements listed in this section shall apply to the piping in the appliance(s).

(b) Materials. All materials used for the installation extension, alteration, or repair, of any oil piping systems shall be new and free from defects or internal obstructions. The system shall be made of materials having a melting point of not less than 1,450 °F, except as provided in § 3280.706(d) and (e). They shall consist of one or more of the materials described in § 3280.706(b)(1) through (4).

(1) Steel or wrought-iron pipe shall comply with ANSI B 36.10–1979, Welded and Seamless Wrought Steel Pipe. Threaded copper or brass pipe in iron pipe sizes may be used.

(2) Fittings for oil piping shall be wrought-iron, malleable iron, steel, or brass (containing not more than 75 percent copper).

(3) Copper tubing must be annealed type, Grade K or L conforming to the Standard Specification for Seamless Copper Water Tube, ASTM B88–93, or shall comply with ASTM B280–1995, Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.

(4) Steel tubing shall have a minimum wall thickness of 0.032 inch for diameters up to ½ inch and 0.049 inch for diameters ½ inch and larger. Steel tubing shall be constructed in accordance with the Specification for Electric-Resistance-Welded Coiled Steel Tubing for Gas and Field Oil Lines, ASTM, A539–90a, and shall be externally corrosion protected.

(c) Size of oil piping. The minimum size of all fuel oil tank piping connecting outside tanks to the appliance to not less than 10 inches nor more than 14 inches water column and the appliance connections tested for leakage with soapy water or bubble solution.