

# 4 WELD PROCESSES

Welding processes are classified into four main groups based on the heat source used: gas, electric, laser, and electron beam.

<p><b>1. Gas Metal Arc Welding (GMAW)</b></p> <p>Uses a consumable electrode and shielding gas. Commonly used for pipe welding and fabrication.</p>	<p><b>2. Gas Tungsten Arc Welding (GTAW)</b></p> <p>Uses a non-consumable tungsten electrode and shielding gas. Known for high precision and clean welds.</p>
<p><b>3. Shielded Metal Arc Welding (SMAW)</b></p> <p>Uses a consumable electrode coated in flux. Versatile and used in various industrial applications.</p>	<p><b>4. Plasma Arc Welding (PAW)</b></p> <p>Uses a plasma arc as the heat source. Provides a very concentrated heat source for precision welding.</p>

# 8 WELDING POSITIONS

Welding positions are defined by the orientation of the workpiece and the welder relative to the weld line.

<p><b>1. 1G (Flat)</b></p> <p>Welding on a horizontal surface with the welder standing above the workpiece.</p>	<p><b>2. 2G (Horizontal)</b></p> <p>Welding on a vertical surface with the welder standing to the side.</p>
<p><b>3. 3G (Vertical)</b></p> <p>Welding on a vertical surface with the welder standing below the workpiece.</p>	<p><b>4. 4G (Overhead)</b></p> <p>Welding on a horizontal surface with the welder standing above the workpiece, but the workpiece is oriented vertically.</p>

# 5 WELDING JOINT TYPES

Welding joints are the configurations of two or more metal parts to be joined by welding.

<p><b>1. Butt Joint</b></p> <p>Two metal pieces are joined by their end surfaces. Common for pipe and plate welding.</p>
<p><b>2. Fillet Joint</b></p> <p>Two metal pieces are joined at a 90-degree angle. Used for structural connections.</p>
<p><b>3. Bevel Joint</b></p> <p>Two metal pieces are joined with beveled edges. Used for thick plate welding.</p>
<p><b>4. Lap Joint</b></p> <p>Two metal pieces overlap and are joined along their length. Used for sheet metal.</p>
<p><b>5. Edge Joint</b></p> <p>Two metal pieces are joined along their edges. Used for sheet metal.</p>