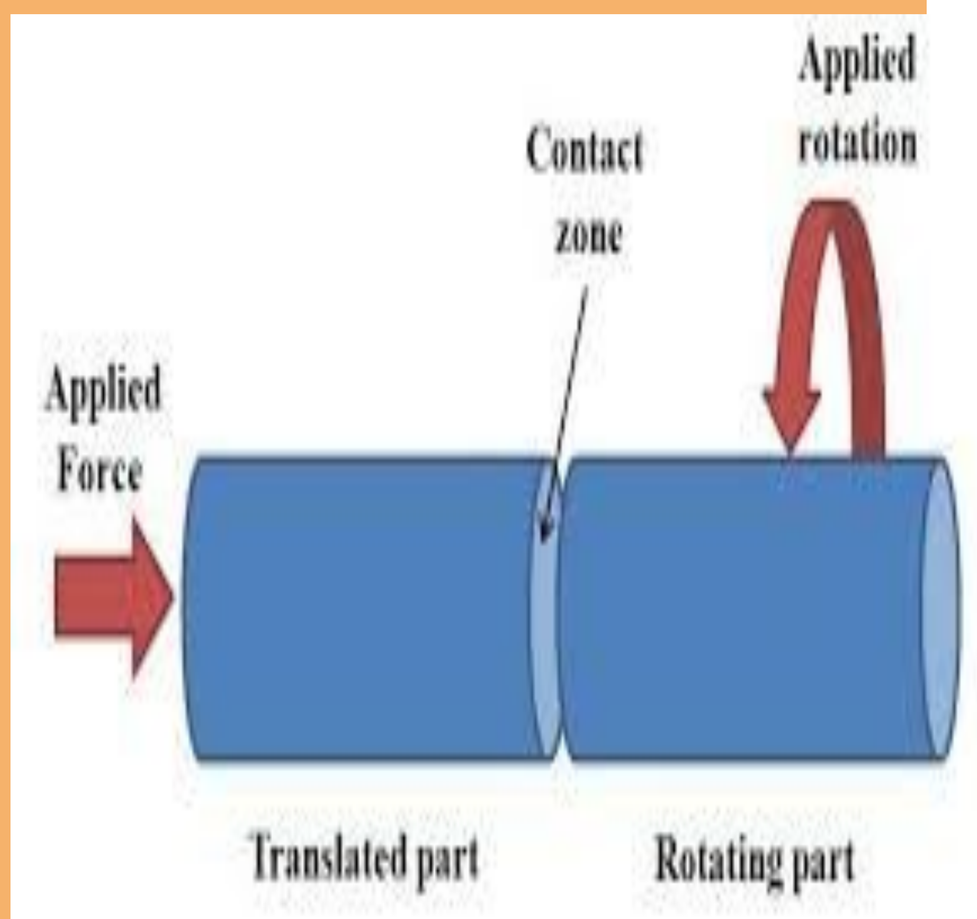
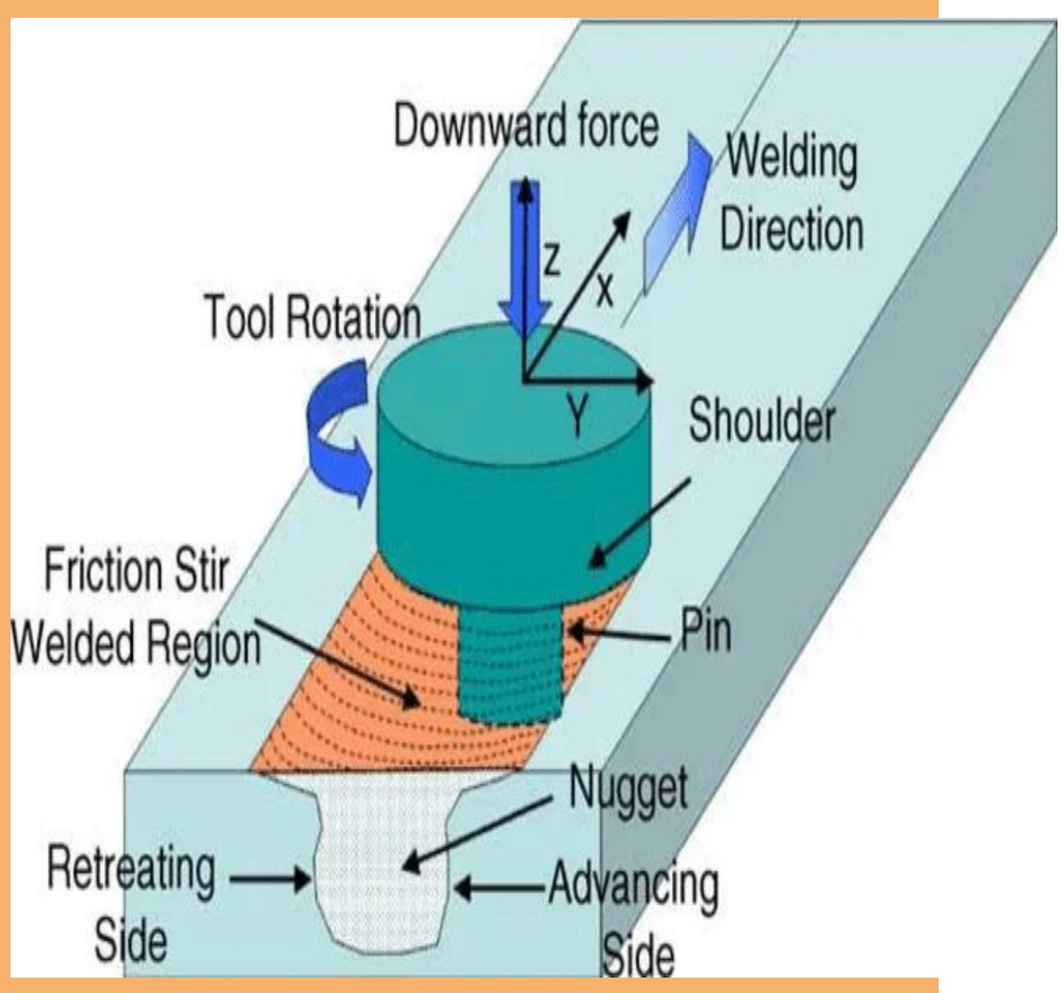
SPRINGFIELD-CLARK CTC CAREER TECHNOLOGY CENTER

Types of welding

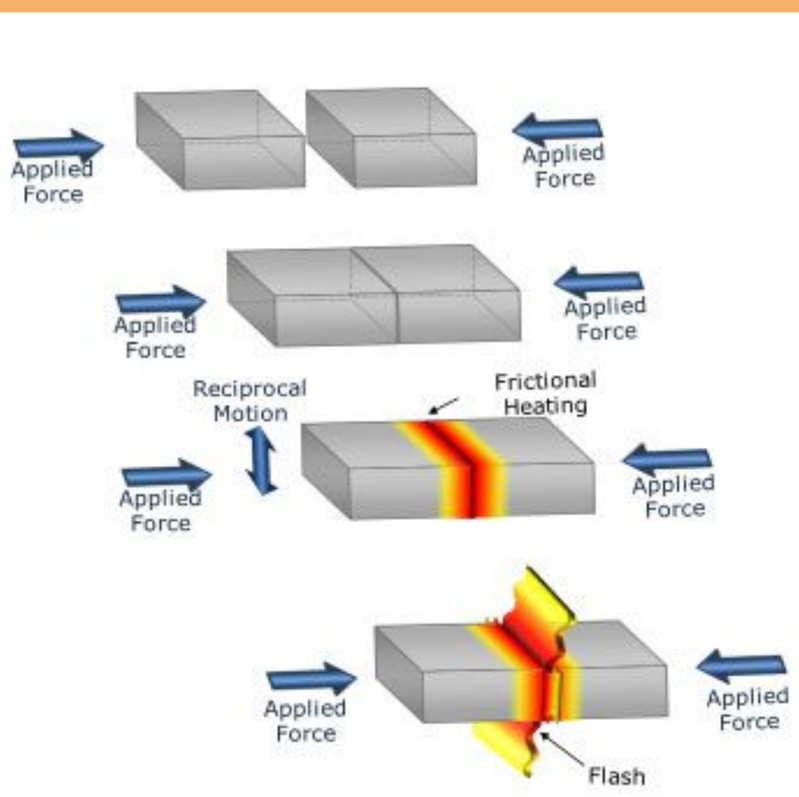
Cole Wiant



Rotary Friction Welding is a solid-state process that joins parts by spinning one component against another under pressure, generating heat through mechanical friction. This heat softens the materials into a plastic state without melting them, allowing them to fuse into a high-strength bond once rotation stops. It is highly valued for its speed, repeatability, and unique ability to weld dissimilar metals that are usually incompatible.



Friction Stir Welding uses a rotating, non-consumable tool that travels along a joint to mechanically "stir" two pieces of metal together. The friction between the tool and the workpiece generates enough heat to soften the metal into a plastic state, but not melt it, creating a high-strength solid bond. It is the preferred method for joining "unweldable" aluminum alloys and large plates for aerospace, marine, and EV battery applications.



Linear Friction Welding (LFW) joins parts by oscillating one component back and forth at high speeds while pressing it against a stationary piece. This rapid linear motion generates friction that plasticizes the metal, creating a high-strength solid-state bond once the movement stops. Its biggest advantage is the ability to join complex, non-circular shapes (like rectangular blocks or jet engine blades) with uniform heat across the entire surface.