

# *WELDING*

IS THE PROCESS OF OBTAINING PERMANENT JOINTS THROUGH THE ESTABLISHMENT OF INTERATOMIC BONDS BETWEEN THE PARTS TO BE WELDED DURING THEIR LOCAL OR GENERAL HEATING, PLASTIC DEFORMATION, OR JOINT ACTION OF BOTH.



# ***BASIC CONCEPTS***

A PERMANENT JOINT MADE BY WELDING IS CALLED A WELDED JOINT. MOST OFTEN WITH THE HELP OF WELDING CONNECT PARTS FROM METALS. HOWEVER, WELDING IS ALSO USED FOR NON-METALS - PLASTICS, CERAMICS, OR COMBINATIONS THEREOF. WHEN WELDING, VARIOUS SOURCES OF ENERGY ARE USED: ELECTRIC ARC, ELECTRIC CURRENT, GAS FLAME, LASER RADIATION, ELECTRON BEAM, FRICTION, ULTRASOUND.

*WELDING IS FEASIBLE UNDER THE FOLLOWING CONDITIONS:*

1. THE USE OF VERY HIGH SPECIFIC PRESSURE OF COMPRESSION OF PARTS, WITHOUT HEATING;
2. HEATING AND SIMULTANEOUS COMPRESSION OF PARTS WITH MODERATE PRESSURE;
3. HEATING OF THE METAL AT THE JUNCTION BEFORE MELTING, WITHOUT APPLYING PRESSURE TO COMPRESS.

## *METAL WELDING CLASSIFICATION*

AVERAGE VALUES OF SPECIFIC ENERGY  $E$  REQUIRED FOR WELDING STEEL DEPENDING ON ITS THICKNESS: 1 - ARGON-ARC WELDING WITH A W-ELECTRODE, 2 - SUBMERGED-ARC WELDING, 3 - PLASMA-ARC WELDING, 4 - ARC WELDING IN VACUUM, 5 - WELDING ELECTRON BEAM CURRENTLY, THERE ARE MORE THAN 150 TYPES AND METHODS OF WELDING PROCESSES. THERE ARE VARIOUS CLASSIFICATIONS OF THESE PROCESSES.

SO, GOST 19521-74 PROVIDES FOR THE CLASSIFICATION OF METAL WELDING ACCORDING TO THE MAIN GROUPS OF SIGNS: PHYSICAL, TECHNICAL AND TECHNOLOGICAL.

THE MAIN PHYSICAL FEATURE OF WELDING IS THE FORM AND TYPE OF ENERGY USED TO PRODUCE A WELDED JOINT. THE FORM OF ENERGY DETERMINES THE CLASS OF WELDING, AND ITS TYPE - THE TYPE OF WELDING.

***THERE ARE THREE WELDING CLASSES:***

***THERMAL CLASS:*** TYPES OF WELDING CARRIED OUT BY MELTING USING THERMAL ENERGY - GAS, ARC, ELECTRON BEAM, LASER, ETC.

***THERMOMECHANICAL CLASS:*** TYPES OF WELDING CARRIED OUT USING HEAT ENERGY AND PRESSURE - CONTACT, DIFFUSION, GAS AND ARC PRESSING, FORGING, ETC.

***MECHANICAL CLASS:*** TYPES OF WELDING CARRIED OUT USING MECHANICAL ENERGY - COLD, FRICTION, ULTRASONIC, EXPLOSION, ETC.



