

# JOINERY

BY :

HITUL PARMAR

SAGAR PATEL

BHARGAV PARUTHI

MEHUL CHAUDHARY

NIRAV SUTHAR





# INTRODUCTION – Joinery

- **JOINERY IS USED TO INDICATE THE ART OF PREPARING AND THEN FRAMING PLACES OF ELEMENTS TO FORM THE INTERNAL FITTINGS AND FINISHING OF HOUSES.**
- **JOINERY IS USED FOR DELICATE CONSTRUCTION AND FOR ENHANCING THE ARCHITECTURAL BEAUTY .**
- **IT INCLUDES THE CONSTRUCTION AND FIXING WORKS, SUCH AS DOORS, WINDOWS, STAIRS, FLOOR BOARDS, LININGS, CUPBOARDS, FURNITURE ETC.**
- **IN INDIA, THE WORK CARPENTRY IS ONLY USED TO INDICATE BOTH KINDS OF WORK NAMELY, CARPENTRY AND JOINERY.**



# TYPES OF JOINTS

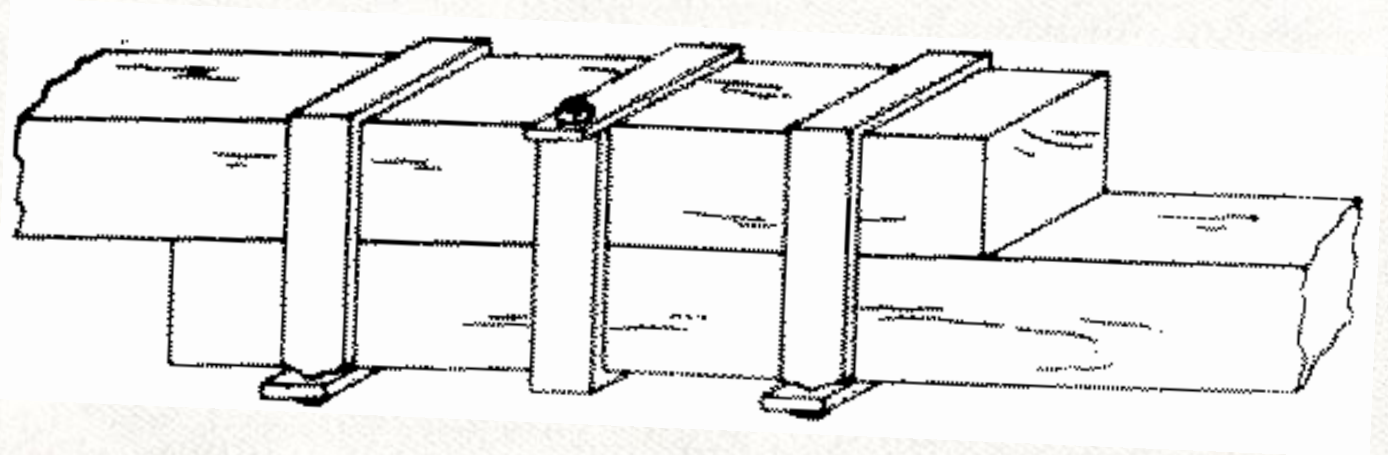
THE FOLLOWING **TYPES OF JOINTS ARE USED IN TIMBER CONSTRUCTION** TO SUIT THE DIFFERENT PURPOSES—

- LENGTHENING JOINTS
- WIDENING OR SIDE JOINTS
- BEARING JOINTS
- FRAMING JOINTS
- ANGLE OR CORNER JOINTS
- OBLIQUE SHOULDERED JOINTS



# lengthening joint

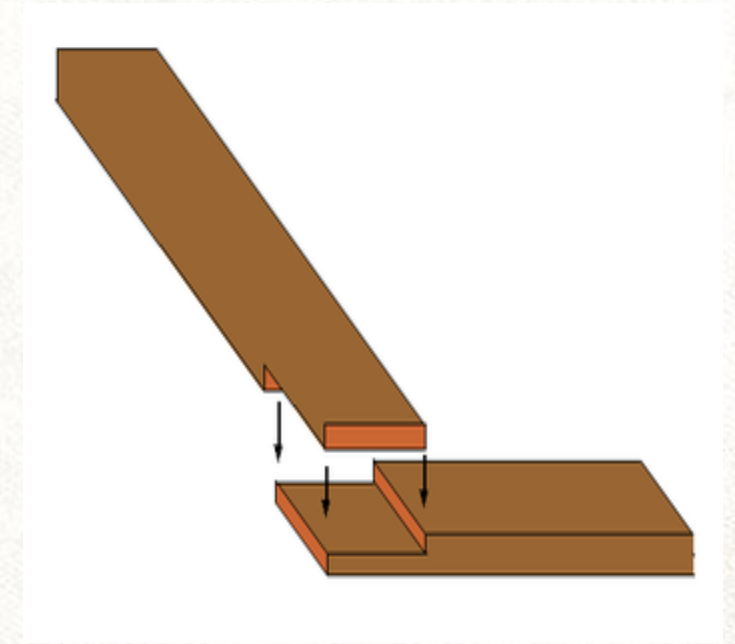
- INCREASING THE LENGTH
- **FOR EXAMPLE** - TIES, STRUTS, MEMBERS SUBJECTED TO BENDING
- **LAPPING OF MEMBER** ONE ABOVE ANOTHER





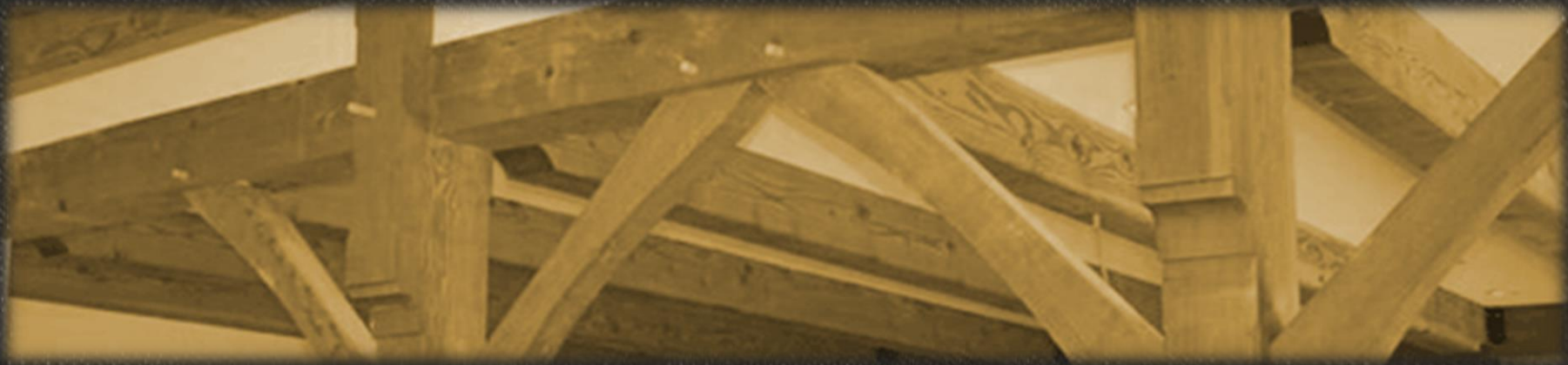
# lengthening joint- LAP JOINT

- A **LAP JOINT** IS MADE BY **OVERLAPPING TWO BOARDS**.
- **LAP JOINTS** CAN BE MADE TO JOIN BOARDS AT A **90 DEGREE ANGLE** (AS SHOWN), NO ANGLE AT ALL (THAT IS, SPLICE TWO BOARDS INTO A LONGER ONE), OR THE TWO BOARDS CAN FORM A CROSS.
- THIS JOINT IS IDEAL WHEN YOU NEED TO BRING TWO BOARDS TOGETHER BUT **KEEP THEM IN THE SAME PLANE**.
- IT IS VERY STRONG EVEN WITHOUT MECHANICAL FASTENERS AS THERE IS A LOT OF GLUABLE SURFACE AREA IN THE JOINT.
- THE **LAPS** CAN BE CUT WITH EITHER A **SAW**, OR A WITH A SAW AND A CHISEL.
- **LARGE LAP JOINTS** SHOULD BE CUT WITH ONLY A **SAW**, BUT THEY CAN BE TRIMMED WITH A CHISEL.



**LAP JOINT**



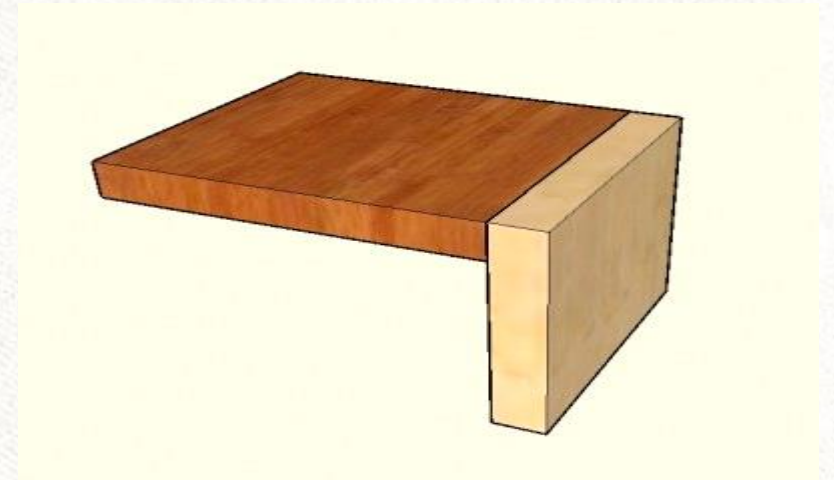
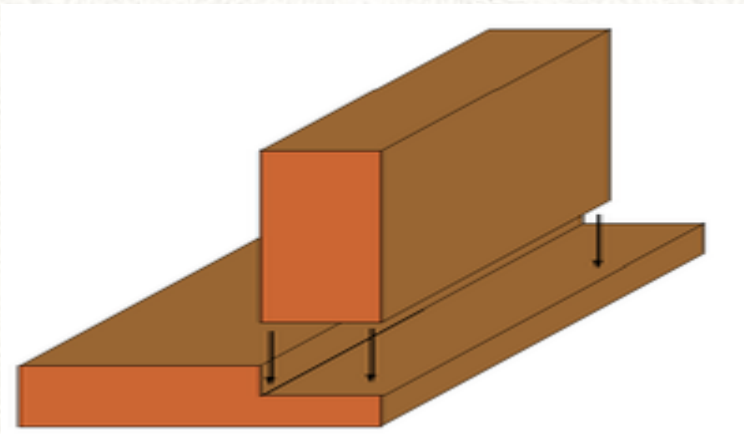




# WIDENING /SIDE JOINTS

- **EXTENDING THE WIDTH OF BOARDS/ PLANKS, PLACED EDGE TO EDGE, EG:- WOODEN FLOORS, DOORS**

**BUTT JOINT** - THIS IS ALSO KNOWN AS SQUARE, STRAIGHT OR PLAIN JOINT. IN THIS, TWO MEMBERS ARE SIMPLY JOINED BY PLACING THEM SIDE TO SIDE. THIS JOINT IS USED FOR ORDINARY WORKS

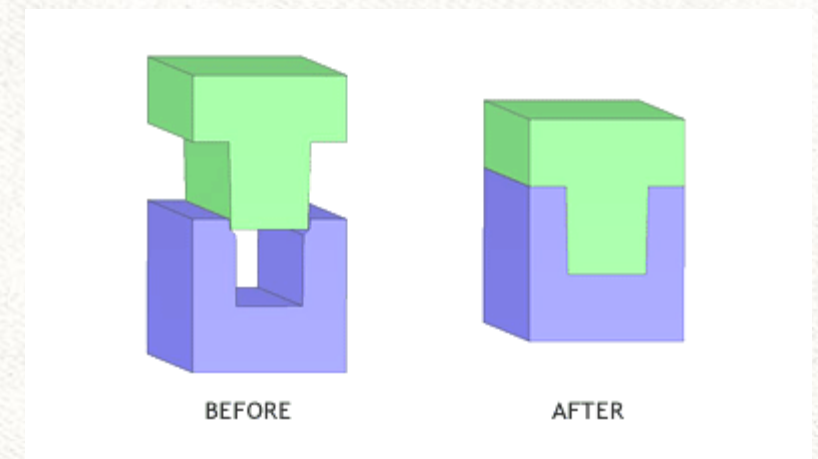
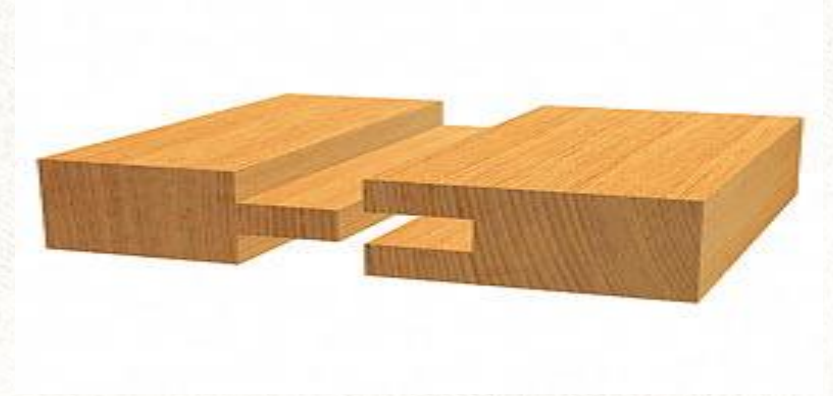


**REBATED AND FILLETED JOINT** - THIS JOINT IS FORMED BY INTRODUCING A SMALL WOODEN PIECE, CALLED 'FILLET' IN THE REBATED PORTION, HAVING SMALL DEPRESSION.



# WIDENING JOINT — TONGUE & GROOVE JOINT

- **TONGUED AND GROOVED JOINT** - THIS JOINT IS FORMED BY FITTING ONE MEMBER, HAVING TONGUE ON ONE SIDE INTO THE OTHER MEMBER WITH A CORRESPONDING GROOVE ON THE SIDE.
- A STRONG JOINT WHICH REQUIRES GLUE, THE **TONGUE AND GROOVE JOINT** IS WIDELY USED FOR RE-ENTRANT ANGLES.
- THE **EFFECT OF WOOD SHRINKAGE** IS CONCEALED WHEN THE **JOINT IS BEADED** OR OTHERWISE MOULDED.
- IN EXPENSIVE CABINET WORK, GLUED DOVETAIL AND MULTIPLE TONGUE AND GROOVE ARE USED.



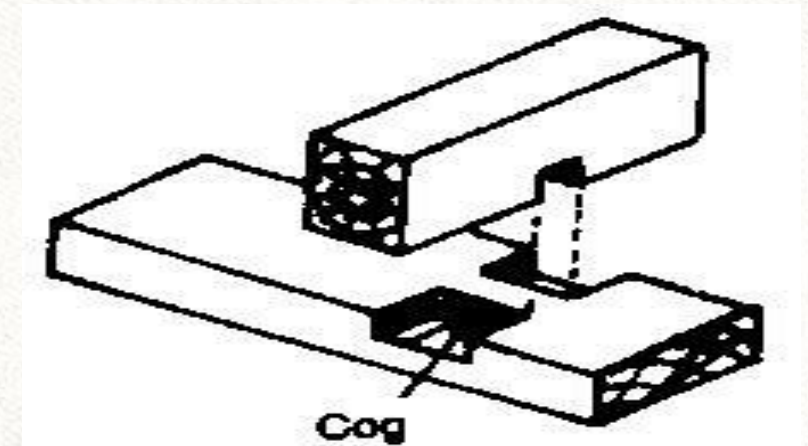
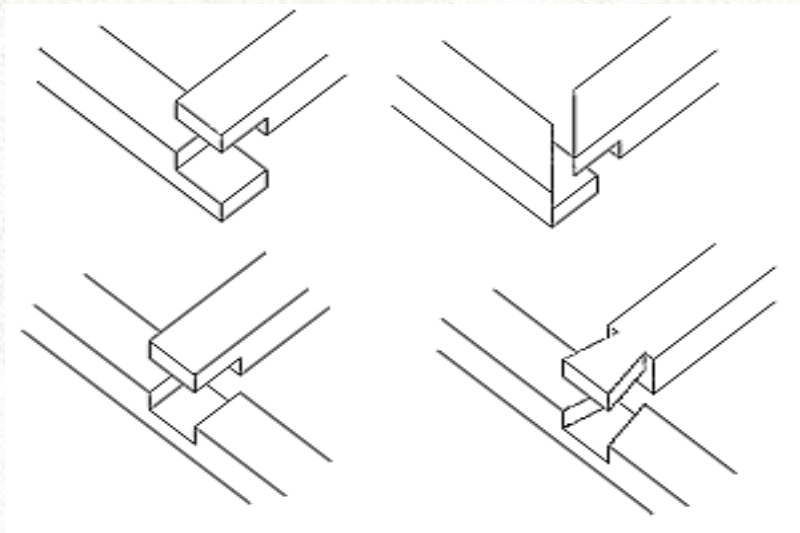






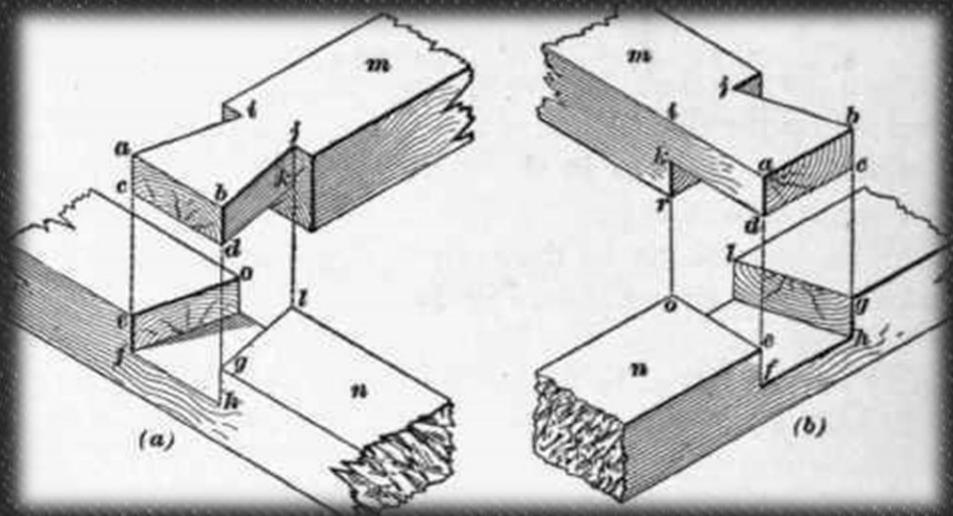
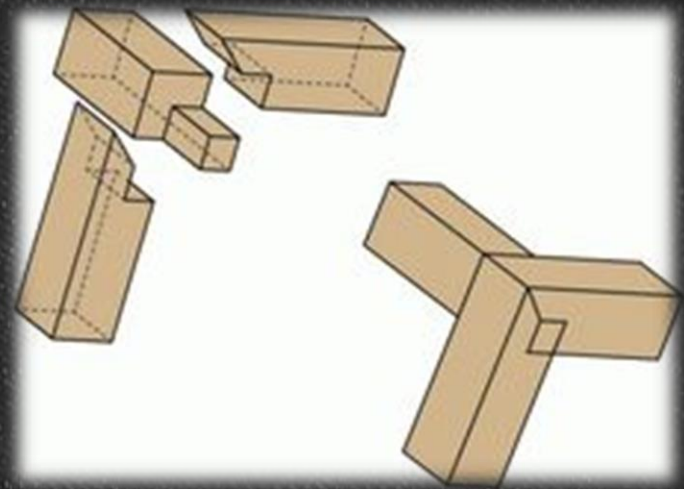
# BEARING JOINTS

- **COGGED JOINT** - THIS JOINT IS FORMED TO MAINTAIN FULL DEPTH OF THE MEMBER OR BEAM AND HENCE NOTCHES ARE MADE ON ONE OR BOTH THE EDGES OF THE LOWER MEMBER, LEAVING AN UNCUT PROJECTION, *I.E.*, COG AND ACCORDINGLY IT IS NAMED AS SINGLE-COGGED OR DOUBLE-COGGED JOINT.



**LONGITUDINAL HALVED JOINT** - TWO TIMBER PIECES AT RIGHT ANGLES, SUCH THAT THEY ARE MADE TO FLUSH ON ONE OR TWO FACES BY CUTTING.

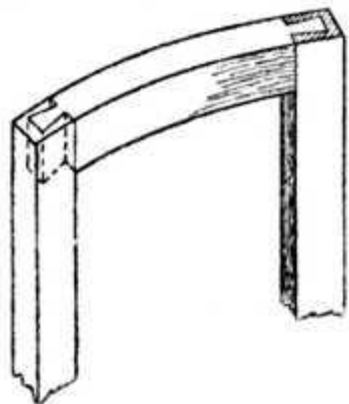




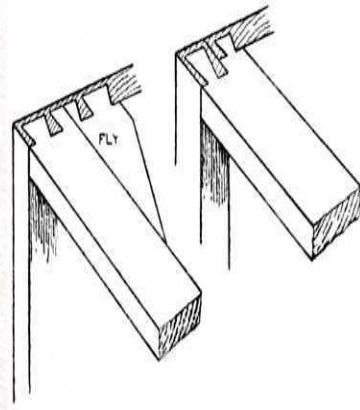


# FRAMING JOINTS

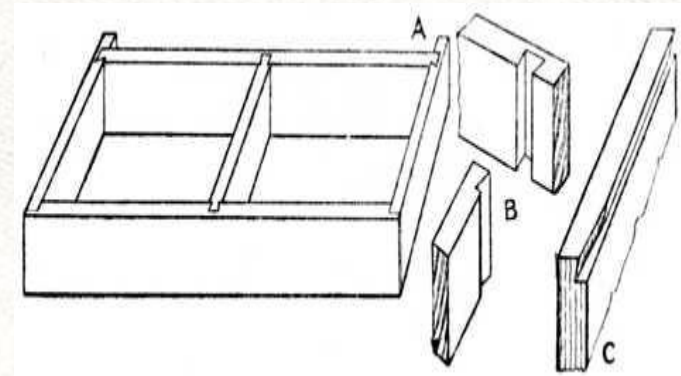
- THESE JOINTS ARE ALMOST **SIMILAR TO THE BEARING JOINTS** DESCRIBED ABOVE AS REGARDS THE TYPES AND CONSTRUCTION.
- BUT THESE ARE SLIGHTLY MODIFIED TO MEET SPECIAL REQUIREMENTS BECAUSE THE PRIMARY CONSIDERATION IN THEIR DESIGN IS NOT STRENGTH, AS IN BEARING JOINTS, BUT ENDURANCE OR DURABILITY.
- THESE JOINTS ARE USED TO CONSTRUCT THE FRAMES OF DOORS, WINDOWS, VENTILATORS AND PARTITIONS, AND HENCE KNOWN AS **TRAINING JOINTS**.



**BOW-FRONTED  
DOOR DOVETAILED**

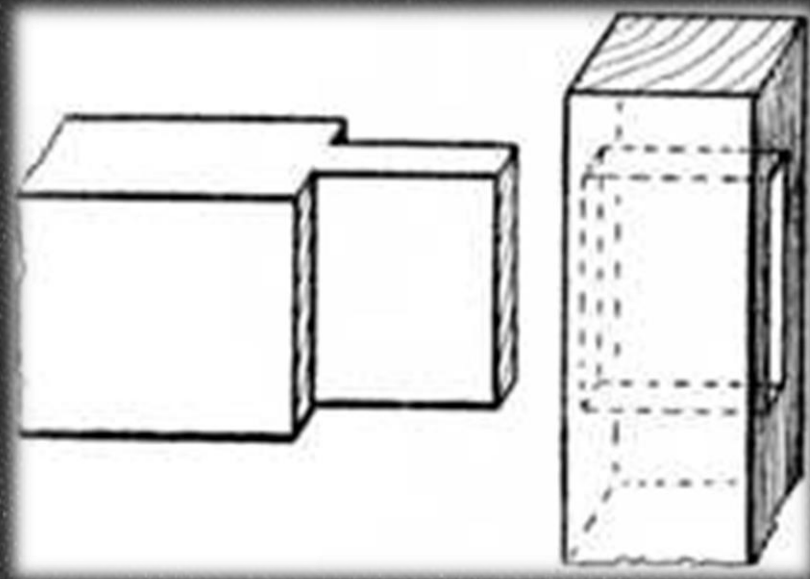


**BEARER RAILS  
DOVETAILED**



**CONSTRUCTIONAL FRAME  
(AS FOR PLINTH OR  
CORNICE) SHOWING  
APPLICATION OF THE  
DOVETAIL JOINT.**

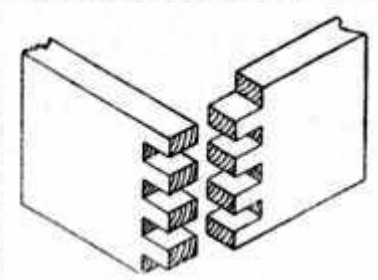




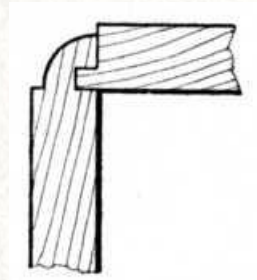


# ANGLE OR CORNER JOINTS

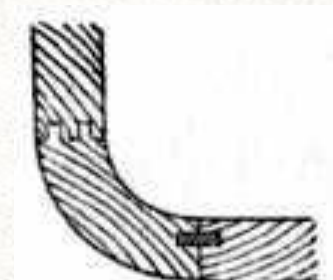
- THESE JOINTS ARE EMPLOYED FOR **CONNECTING THE ENDS AND EDGES** OF MEMBERS, JOINTS PARALLEL OR AT RIGHT ANGLES TO THEIR GRAINS. **ANGLE JOINTS** ARE VERY OFTEN **SECURED BY NAILING**, AND **GLUE IS USED** IN MAKING OF SUCH JOINTS.



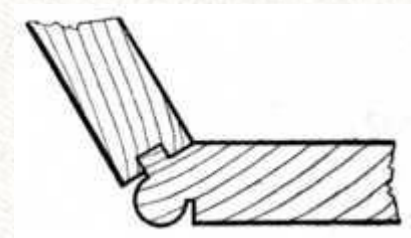
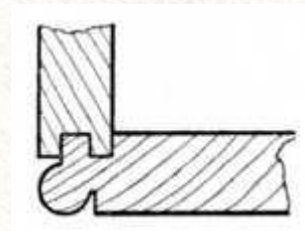
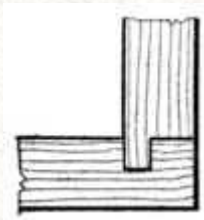
**COMBING OR  
LOCKING JOINT**



**CORNER JOINT WITH  
CORNER MOULD**

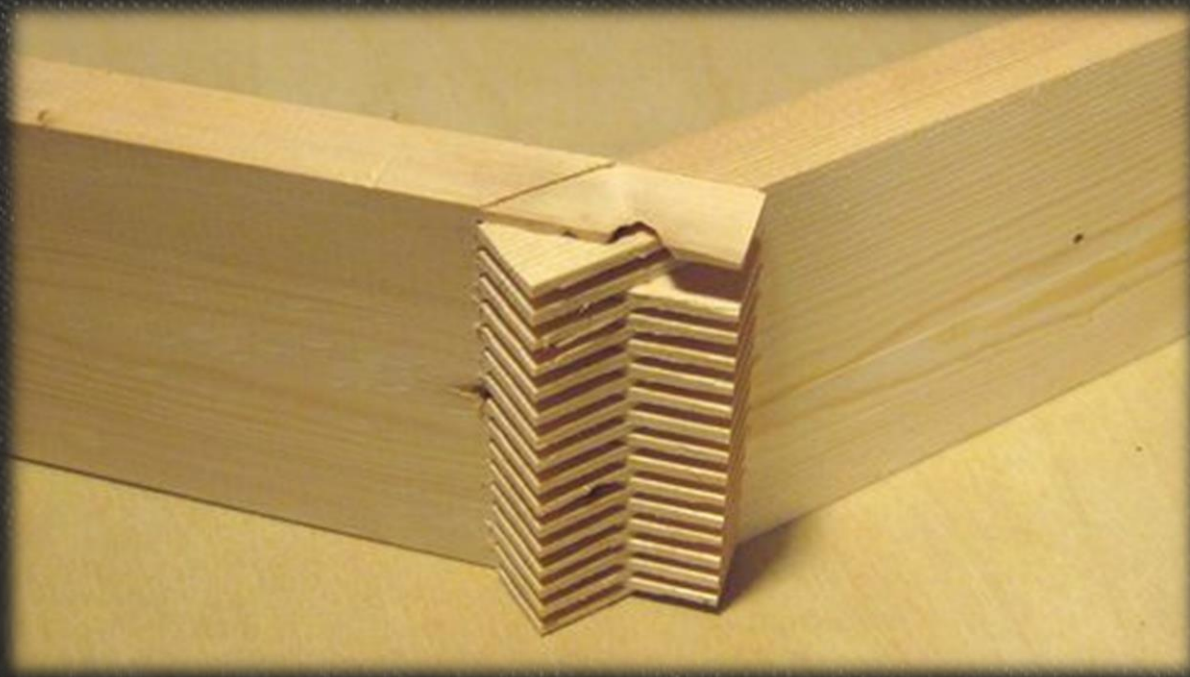
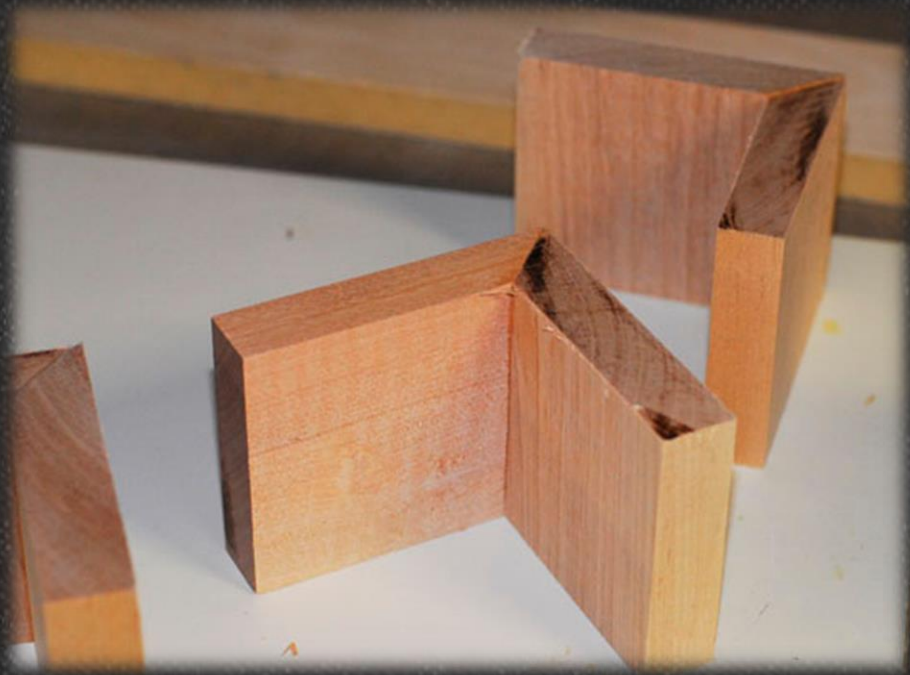


**SINGLE LOOSE TONGUE AND  
DOUBLE-TONGUE JOINT**



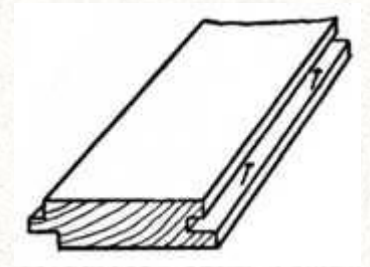
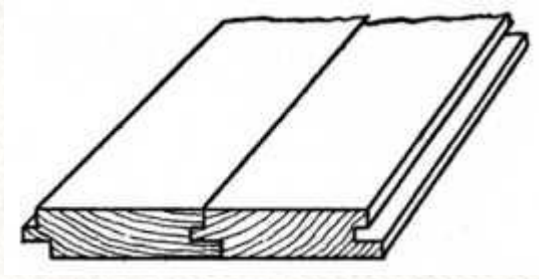
**EXAMPLES OF TONGUED AND GROOVED CORNER JOINTS**







# EXAMPLES OF JOINTS



TONGUED AND GROOVED FLOORING BOARD



MATCH BOARDING, WITH  
BEAD ON ONE SIDE



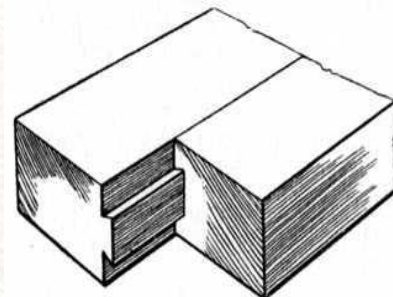
MATCH BOARDING,  
WITH BEAD AT EACH



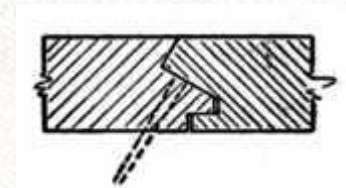
MATCH BOARDING, TONGUED,  
GROOVED AND VEE'D



DOUBLE-TONGUED  
MATCH BOARDING



JOINT WITH SINGLE DOVETAIL  
TONGUE AND GROOVE



METHOD OF SECRET-NAILING  
HARDWOOD FLOORING BOARDS



# METAL JOINERY



METAL JOINERY IS MOSTLY THE WELDING PART OF DIFFERENT METAL PRODUCTS AND ITS CONNECTION TO WOODWORK.



# INTRODUCTION

WELDING IS A FABRICATION OR SCULPTURAL PROCESS THAT JOINS MATERIALS, USUALLY METALS OR THERMOPLASTICS, BY CAUSING COALESCENCE. THIS IS OFTEN DONE BY MELTING THE WORKPIECES AND ADDING A FILLER MATERIAL TO FORM A POOL OF MOLTEN MATERIAL (THE WELD POOL) THAT COOLS TO BECOME A STRONG JOINT, WITH PRESSURE SOMETIMES USED IN CONJUNCTION WITH HEAT, OR BY ITSELF, TO PRODUCE THE WELD. THIS IS IN CONTRAST WITH SOLDERING AND BRAZING, WHICH INVOLVE MELTING A LOWER-MELTING-POINT MATERIAL BETWEEN THE WORKPIECES TO FORM A BOND BETWEEN THEM, WITHOUT MELTING THE WORK PIECES.







# TYPES

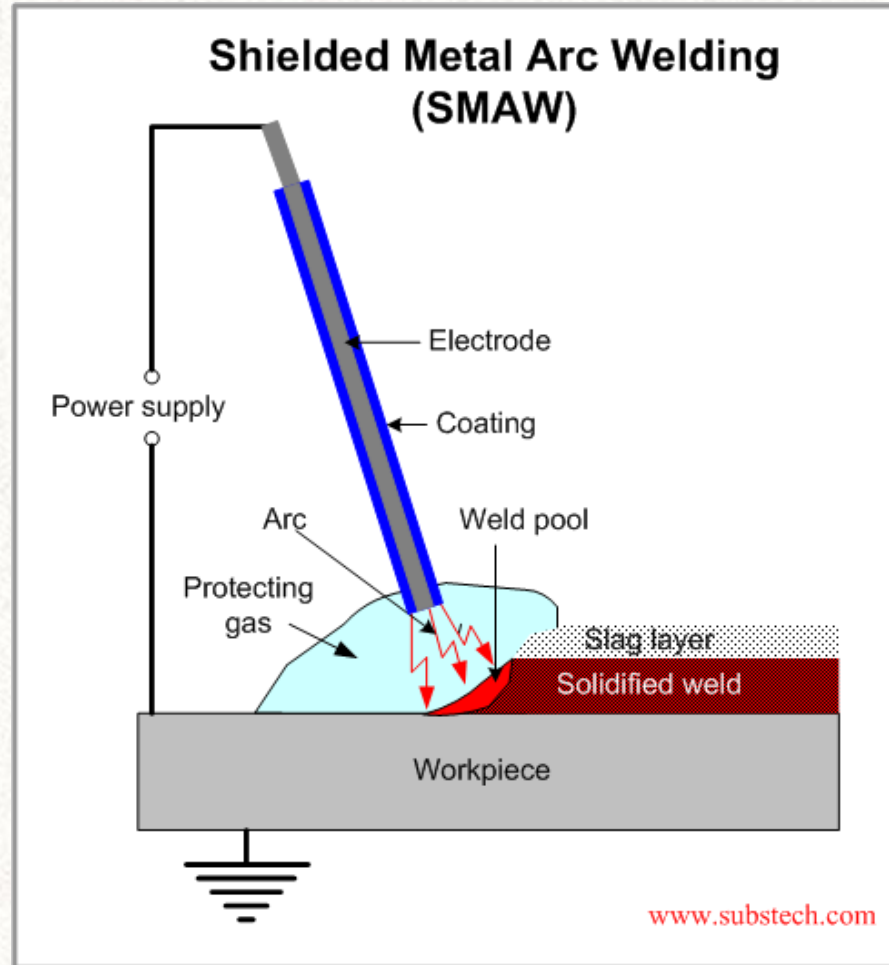
- SHIELDED METAL ARC WELDING (SMAW) - ALSO KNOWN AS "STICK WELDING", USES AN ELECTRODE THAT HAS FLUX, THE PROTECTANT FOR THE PUDDLE, AROUND IT. THE ELECTRODE HOLDER HOLDS THE ELECTRODE AS IT SLOWLY MELTS AWAY. SLAG PROTECTS THE WELD PUDDLE FROM ATMOSPHERIC CONTAMINATION.
- GAS TUNGSTEN ARC WELDING (GTAW) - ALSO KNOWN AS TIG (TUNGSTEN, INERT GAS), USES A NON-CONSUMABLE TUNGSTEN ELECTRODE TO PRODUCE THE WELD. THE WELD AREA IS PROTECTED FROM ATMOSPHERIC CONTAMINATION BY AN INERT SHIELDING GAS SUCH AS ARGON OR HELIUM.
- GAS METAL ARC WELDING (GMAW) - COMMONLY TERMED MIG (METAL, INERT GAS), USES A WIRE FEEDING GUN THAT FEEDS WIRE AT AN ADJUSTABLE SPEED AND FLOWS AN ARGON-BASED SHIELDING GAS OR A MIX OF ARGON AND CARBON DIOXIDE (CO<sub>2</sub>) OVER THE WELD PUDDLE TO PROTECT IT FROM ATMOSPHERIC CONTAMINATION.
- FLUX-CORED ARC WELDING (FCAW) - ALMOST IDENTICAL TO MIG WELDING EXCEPT IT USES A SPECIAL TUBULAR WIRE FILLED WITH FLUX; IT CAN BE USED WITH OR WITHOUT SHIELDING GAS, DEPENDING ON THE FILLER.



- SUBMERGED ARC WELDING (SAW) - USES AN AUTOMATICALLY FED CONSUMABLE ELECTRODE AND A BLANKET OF GRANULAR FUSIBLE FLUX. THE MOLTEN WELD AND THE ARC ZONE ARE PROTECTED FROM ATMOSPHERIC CONTAMINATION BY BEING "SUBMERGED" UNDER THE FLUX BLANKET.
- ELECTROSLAG WELDING (ESW) - A HIGHLY PRODUCTIVE, SINGLE PASS WELDING PROCESS FOR THICKER MATERIALS BETWEEN 1 INCH (25 MM) AND 12 INCHES (300 MM) IN A VERTICAL OR CLOSE TO VERTICAL POSITION.

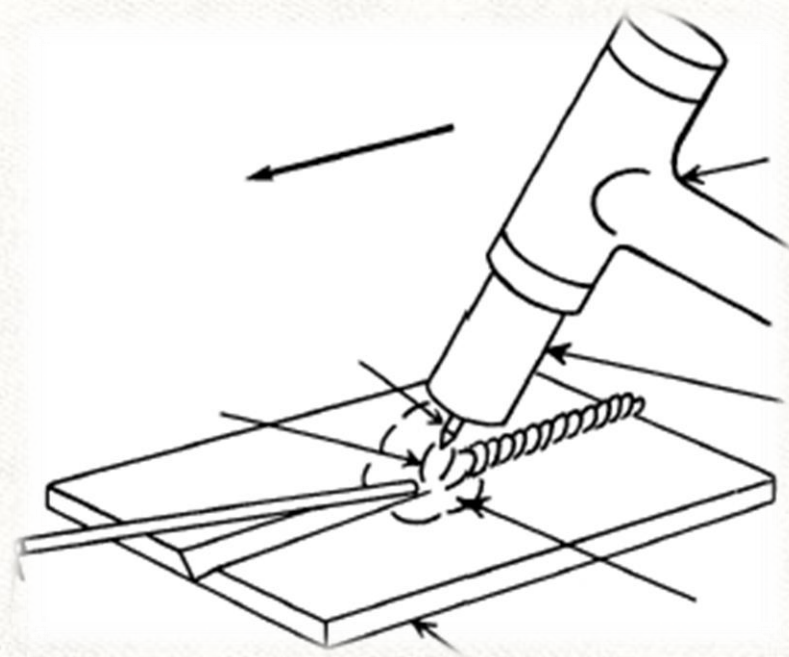
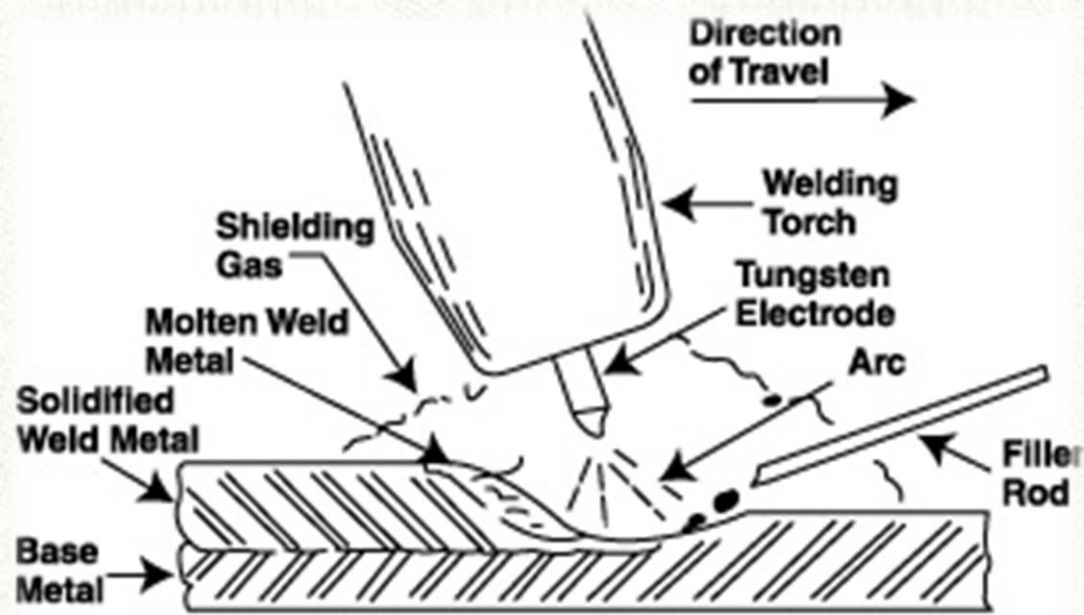


# SHIELDED METAL ARC WELDING





# GAS TUNGSTEN ARC WELDING



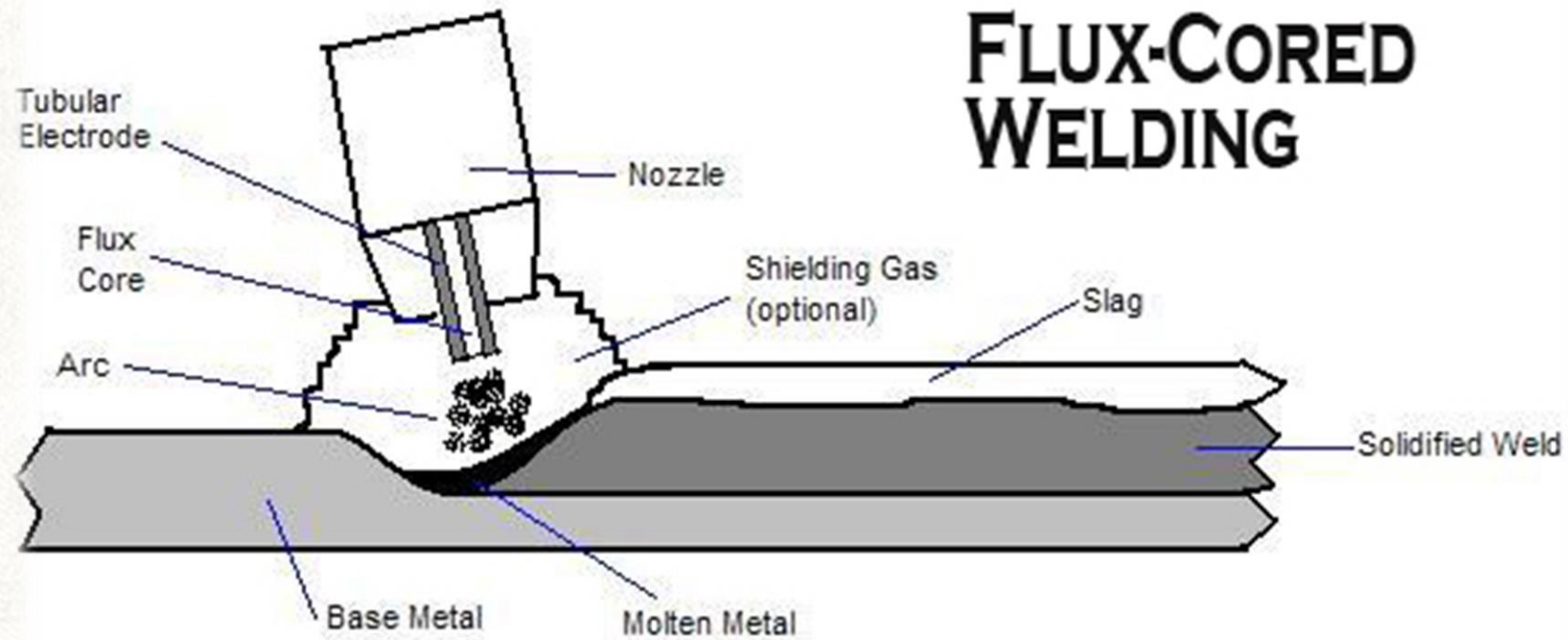


# GAS METAL ARC WELDING



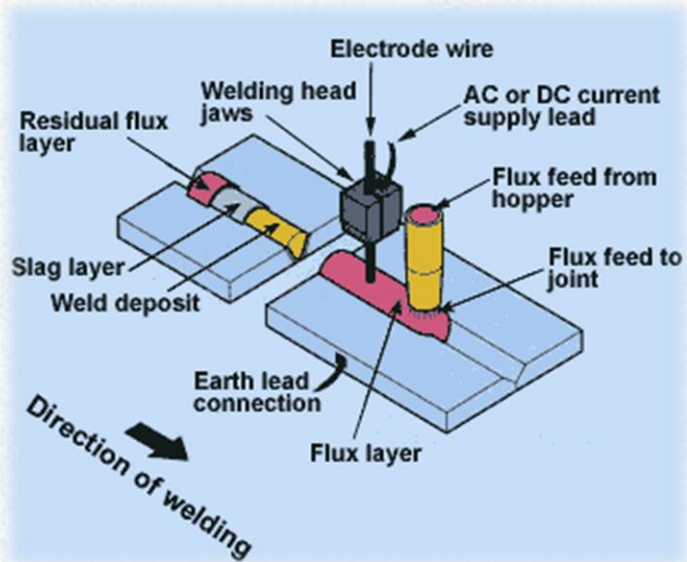


# FLUX-CORED ARC WELDING



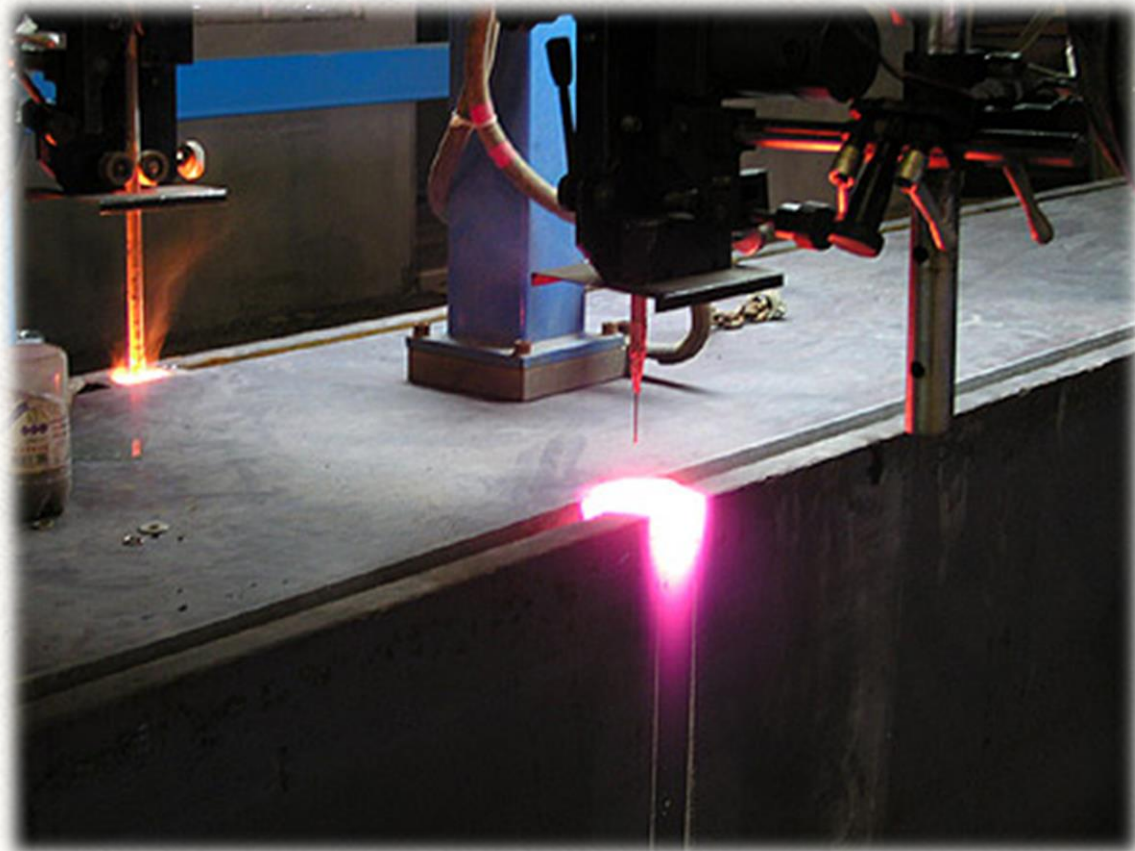


# SUBMERGED ARC WELDING



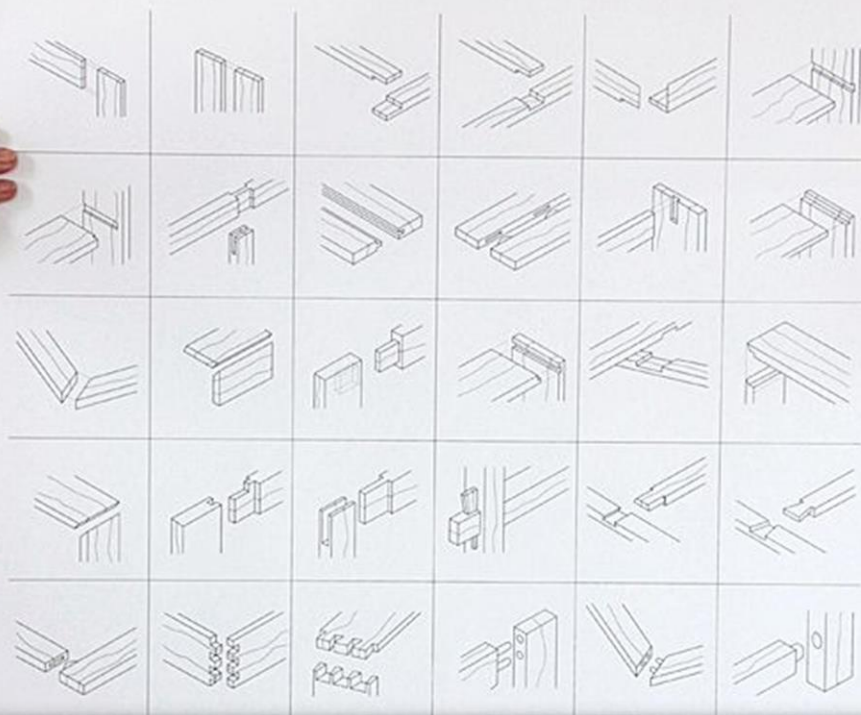


# ELECTROSLAG WELDING





# JOINERY



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