KEY RACK

Key Rack

Aim: To make a key rack.

Objective:

After performing the practical, the learner will be able to:

PRO1: Use the handsaw for cutting wooden block

PRO2: Use of metal jack planner

PRO3: Know about marking gauge and other measuring devices and drill

PRO 4: Know about the pliers, firmer chisel, scriber and fevicol

PRO5: Use of rasp cut file and varnish

Material:

2 x ½" Teakwood, 1½" x ½" Teakwood & 'J' Hook

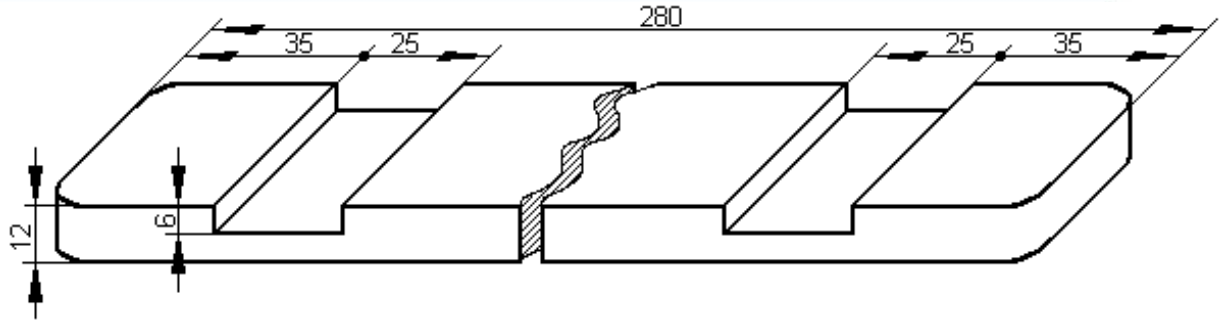
Tools:

Scale, Handsaw, Metal jack planner, marking gauge, pliers, firmer chisel, scriber, hammer, and rasp cut file etc.

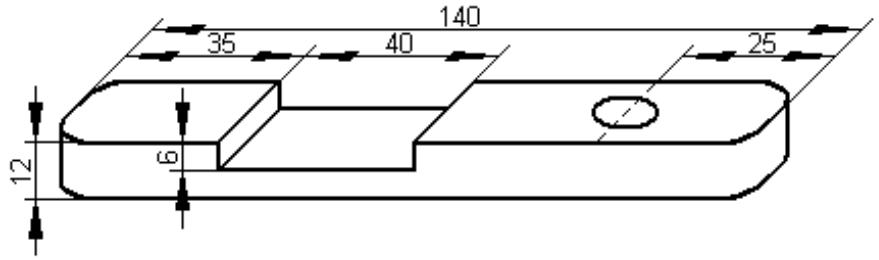
Theoretical background:

Key rack is a part of carpentry which consists of series of hooks designed to hold keys. It can be mounted on wall or can be placed on the table. During making key rack learner learns about the various carpentry tools and processes.

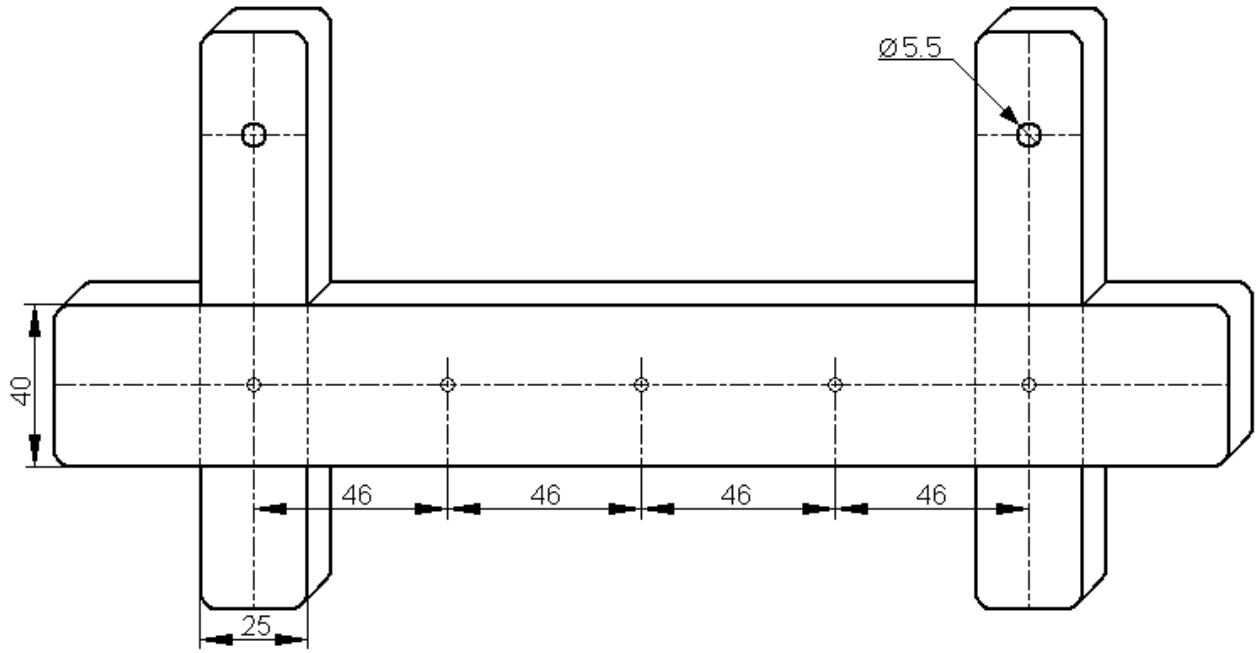
a) **Hand saws:** In carpentry hand saws is also known as "panel saws", are used to cut pieces of wood into different shapes. This is usually done in order to join the pieces together and crave a wooden object.
b) **Metal jack planner:** It is a general purpose carpentry bench plane use for dressing timber down to the correct size in preparation for truing edge jointing.
c) **Marking gauge:** It is also known as "scratch gauge", it is used to mark out lines for cutting or other operations. The purpose of the gauge is to scribe a line parallel to a reference edge.
d) **Scriber:** It is a hand tool used in carpentry to make lines on work pieces, prior to machining.
e) **Pliers:** Pliers are made in various shapes and sizes and for many uses. Some are used for gripping something round like a pipe or rod, some are used for twisting wires or may be for cutting wire.
f) **Firmer chisel:** It is one of the types of carpentry chisel use for specific purpose, it has a blade with a thick rectangular cross section, making them stronger for use on tougher and heavier work.



PART 'A' :- 01 Nos.



PART 'B' :- 02 Nos.



KEY RACK

g) Rasp cut file: It is a form of file with distinct, individually cut teeth used for coarsely removing large amount of material from a work piece.

h) Hammer: It is a device that delivers a sudden impact to an object. Hammers vary in shape, size and structure depending upon their purpose. These are usually made of steel.

Procedure:

PRO 1: Initially cut all the wooden piece of Key Rack as per the given size by using handsaw.

PRO 2: Perform planning operation by using metal jack planner.

PRO 3:

3.1: Do the marking as per the given diagram by using try square, marking gauge, scale & pencil.

3.2: Cut 6 x 40 mm slot on 35 mm from one end of two pieces of size 140 mm (part 'B') by using firmer chisel & handsaw.

3.3 Do the drilling of Ø 5.5 mm on part 'B' as per given diagram.

3.4 Cut 6 x 25 mm slot on 35 mm from both the end of one piece of size 280 mm (part 'A') by using firmer chisel & handsaw.

PRO 4:

4.1: Assemble part 'A' & part 'B' as per diagram by using fevicol.

4.2: Do drilling of Ø 2.5 mm on part 'A' as per given diagram by holding with pliers.

PRO 5:

5.1: Do the finishing of Key Rack with help of rasp cut file & wooden polish paper.

5.2: At the end perform varnishing operation as per instructions.

5.3: Then assemble the 'J' hook by using plier.

Precaution:

1) When sawing do not apply to much pressure and use correct speed.

2) Mark dimensions properly & carefully as per given diagram.

Result and discussion:

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WOODEN ROLLER

Wooden Roller

Aim: To make wooden roller.

Objective:

After performing the practical, the learner will be able to:

PRO1: Use of scale and other measuring & marking devices.

PRO2: Learn the use of metal jack planner.

PRO3: Learn the use of wood turning tool like firmer chisel & use of outside caliper.

PRO4: Know the uses of various wood turning tool.

PRO5: Learn the use of rasp cut file & sand paper.

Material: 1½" x 1½" x 14" Teak wood.

Tools: Scale, Handsaw, Rasp cut file, Metal Jack Planner, Hammer, Outside caliper, Measuring Tape, Wood Turning Tool set etc.

Theoretical background:

a) **Scale:** It is made of stainless steel and is use for measuring the length of the pipe and to make accurate marking where ever its required.

b) **Metal jack planner:** It is a general purpose carpentry bench plane use for dressing timber down to the correct size in preparation for truing edge jointing.

c) **Wood turning tool:** It is a hand held tool used to cut a shape that is symmetrical around the axis of rotation

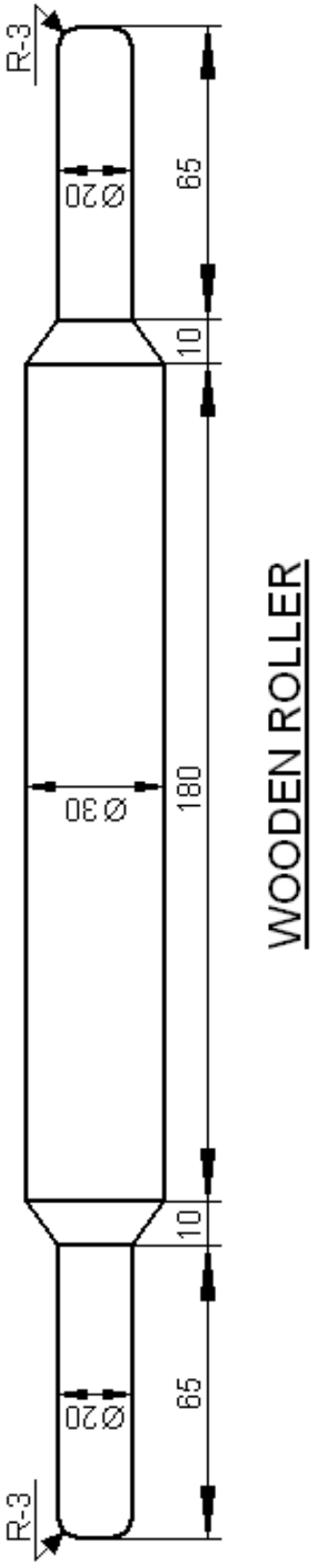
d) **Outside caliper:** A caliper whose legs turn inward so that it can measure the outside dimensions, as the diameter of rod.

e) **Measuring Tape:** It is a flexible ruler used to measure distance. It consists of ribbon of cloth or metal strip with linear measurement markings.

f) **Hand saws:** In carpentry hand saws is also known as "panel saws"**,** are used to cut pieces of wood into different shapes. This is usually done in order to join the pieces together and crave a wooden object.

g) **Hammer:** It is a device that delivers a sudden impact to an object. Hammers vary in shape, size and structure depending upon their purpose. These are usually made of steel.

h) **Rasp cut file:** It is a form of file with distinct, individually cut teeth used for coarsely removing large amount of material from a work piece.



WOODEN ROLLER

Procedure: -

PRO1

1.1: Measure and mark all the dimensions on the work piece by using scale

1.2: Find out center of face and mark circle of diameter 30 mm on the job.

PRO2: Plane the four edges of the job by using jack planner.

PRO3

3.1: Firmly hold the job on the wood turning machine in between centers.

3.2: First, use firmer chisel & do plane turning and maintain the diameter of wood is 30 mm.

3.3: Check the parallelism with help of outside caliper.

3.4: Then do marking as per diagram.

3.5: Do step of Ø20 x 65 mm on both the end of job as per diagram.

PRO4

4.1: Do the taper turning by using parting tool as per diagram.

4.2: Do radius on both the end of R-3 by using gauge as per diagram.

PRO5

5.1: Then use sand paper for smoothness.

5.2: Remove job from lathe machine and Saw off extra material & smoothen corners by rasp cut file.

Precaution: -

a) Do not ware loose cloth while working on machine.

b) Hold the job firmly on the machine.

c) Do not use cutting tool without handle.

Result and discussion:

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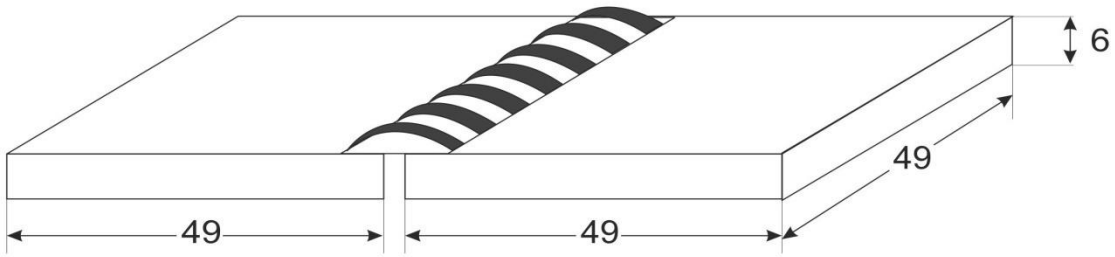
Butt Joint by Arc Welding



Butt Joint

Butt Joint By Arc Welding

Aim: To make **Butt Joint By Arc Welding**

Objective:
After performing the practical, the learner will be able to:
PRO1: Use of scale, hacksaw, files
PRO2: Know and practice how to use welding machine and its various components.
PRO3: Know about the use of cleaning tools like chipping hammer wire brush etc.
PRO4: Know the specific use of oil can, welding screen and flat tong

Material:

M.S. Plate of 100 x 50 x 6 mm, M.S. Electrode Ø 2.5 mm.

Tools:

Scale, Try Square, Hacksaw, Wire Brush, Welding Screen, Flat Tong, Gloves, Chipping Hammer, File & Welding M/C(Transformer) Etc.

Theoretical background: Scale: It is made of stainless steel and is use for measuring the length of the pipe and to make accurate marking where it is require.

a) **Hacksaws:** In welding hacksaw is use for cutting work pieces of metal into different sizes. It has fine toothed blade combined with C-shaped frame that hold it under tension.
b) **Try square:** - It's a wooden or metal working tool used for marking and measuring the work piece The square refers to the tool's primary use of measuring the accuracy of a right angle , to try surface is to check its straightness or correspondence to an adjoining surface.
c) **Welding machine transformer:** It is use to transform the power supply from moderate voltage and current into a high current and low voltage supply.
d) **Chipping hammer:** It is use to remove the extra material or spatter from the weld surface.
e) **Wire brush:** It is a brush consisting of wire bristles usually of medium carbon steel. It is use to clean surfaces and to create a better conductive area for electricity.
f) **Welding screen:** It is use by the welders during performing welding. It protects the eyes from the harmful UV rays generating from the welding torch.

g) **Flat tong:** It is used to hold and lift the work piece instead of holding them directly with hands.

h) **Gloves:** It is use during welding because they protect our hands against any sort of contact with heat or mechanical aggression. Its main role is to protect from the molten metal and heat given off by welding gun.

Procedure: -

PRO 1:

1.1: Take the M.S. plate of 100 x 50 x 6 mm dimension by using scale.

1.2: Cut the 2 pieces of 50 mm with hacksaw.

1.3: Hold the one piece of plate in a vice & prepare all edges to 90° with filling.

1.4: Repeat same operation for the remaining plats & maintain it in equal size.

1.5: Remove burr of all edges.

PRO 2:

2.1: Take two plates, set the 'Butt' joint as per show in dig.

2.2: Start the welding machine & set the current 70 amps.

2.3: Take the electrode Ø 2.5mm & hold it in the electrode holder.

2.4: Do tag weld at the corner of joint.

2.5 Welding is then carried out throughout the length of the Butt joint

PRO 3: Clean the tag weld with help of chipping hammer & wire brush.

PRO 4: Use welding screen and flat tong as a safety instrument during welding process.

Precaution: -

1) Use the tong for lifting hot job.

2) Use welding screen, hand gloves while welding.

Result and discussion:

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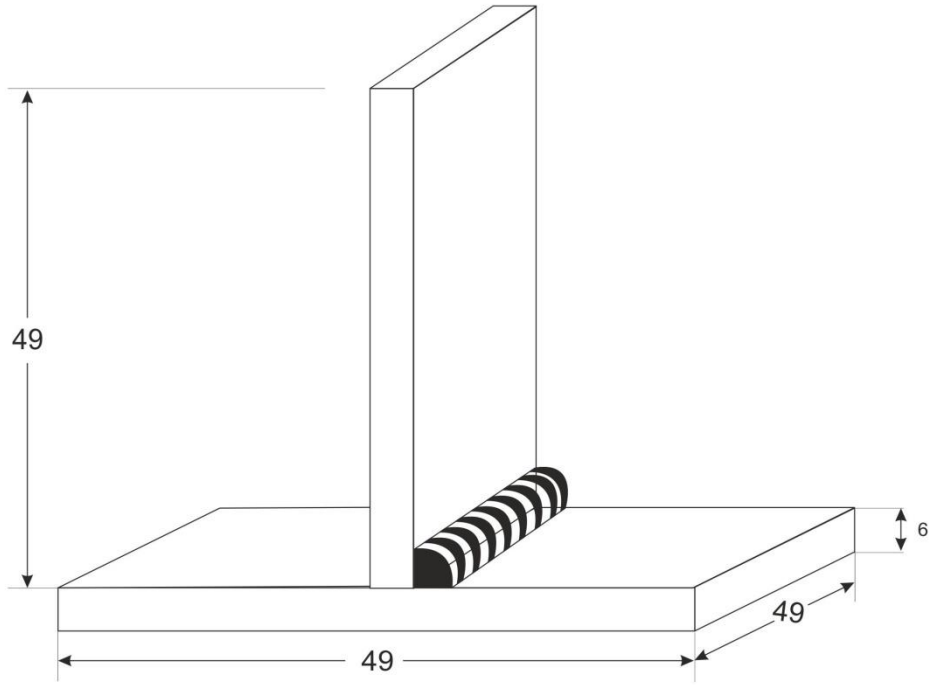
TEE JOINT By Arc Welding



Tee Joint

Tee Joint by Arc Welding

Aim: To make **Tee Joint by Arc Welding**

Objective:

After performing the practical, the learner will be able to:

PRO1: Use of scale, hacksaw, files

PRO2: Know and practice how to use welding machine and its various components.

PRO3: Know about the use of cleaning tools like chipping hammer wire brush etc.

PRO4: Know the specific use of oil can, welding screen and flat tong

Material:

M.S. Plate of 100 x 50 x 6 mm, M.S. Electrode Ø 2.5 mm.

Tools:

Scale, Try Square, Hacksaw, Wire Brush, Welding Screen, Flat Tong, Gloves, Chipping Hammer, File & Welding M/C(Transformer) Etc.

Theoretical background: Scale: It is made of stainless steel and is use for measuring the length of the pipe and to make accurate marking where it is require.

a) **Hacksaws:** In welding hacksaw is use for cutting work pieces of metal into different sizes. It has fine toothed blade combined with C-shaped frame that hold it under tension.

b) **Try square:** - It's a wooden or metal working tool used for marking and measuring the work piece The square refers to the tool's primary use of measuring the accuracy of a right angle , to try surface is to check its straightness or correspondence to an adjoining surface.

c) **Welding machine transformer:** It is use to transform the power supply from moderate voltage and current into a high current and low voltage supply.

d) **Chipping hammer:** It is use to remove the extra material or spatter from the weld surface.

e) **Wire brush:** It is a brush consisting of wire bristles usually of medium carbon steel. It is use to clean surfaces and to create a better conductive area for electricity.

f) **Welding screen:** It is use by the welders during performing welding. It protects the eyes from the harmful UV rays generating from the welding torch.

g) **Flat tong:** It is used to hold and lift the work piece instead of holding them directly with hands.

h) Gloves: It is use during welding because they protect our hands against any sort of contact with heat or mechanical aggression. Its main role is to protect from the molten metal and heat given off by welding gun.

Procedure: -

PRO 1:

1.1: Take the M.S. plate of 100 x 50 x 6 mm dimension by using scale.

1.2: Cut the 2 pieces of 50 mm with hacksaw.

1.3: Hold the one piece of plate in a vice & prepare all edges to 90° with filling.

1.4: Repeat same operation for the remaining plat & maintain it in equal size.

1.5: Remove burr of all edges.

PRO 2:

2.1: Take two plates, set the 'Tee' joint as per show in dig.

2.2: Start the welding machine & set the current 70 amps.

2.3: Take the electrode Ø 2.5mm & hold it in the electrode holder.

2.4: Do tag weld at the corner of joint.

2.5: Welding is then carried out throughout the length of the Tee joint

PRO 3: Clean the tag weld with help of chipping hammer & wire brush.

PRO 4: Use welding screen and flat tong as a safety instrument during welding process.

Precaution: -

3) Use the tong for lifting hot job.

4) Use welding screen, hand gloves while welding.

Result and discussion:

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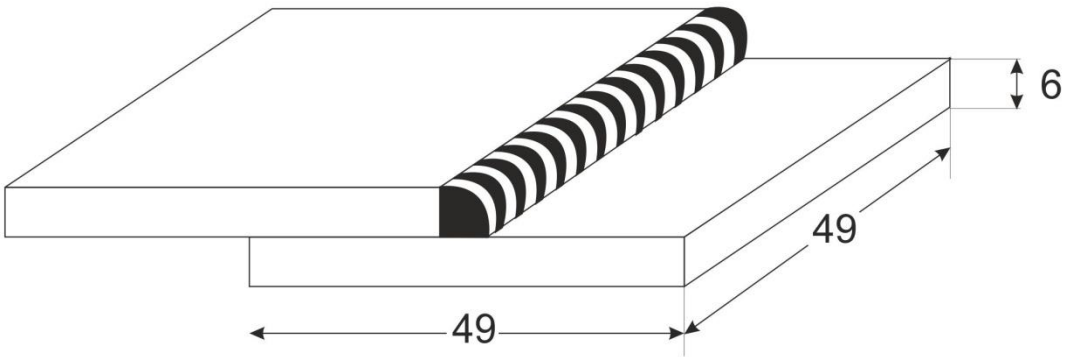
LAP JOINT By Arc Welding



Lap Joint

Lap Joint By Arc Welding

Aim: To make **Lap Joint By Arc Welding**

Objective:

After performing the practical, the learner will be able to:

PRO1: Use of scale, hacksaw, files

PRO2: Know and practice how to use welding machine and its various components.

PRO3: Know about the use of cleaning tools like chipping hammer wire brush etc.

PRO4: Know the specific use of oil can, welding screen and flat tong

Material:

M.S. Plate of 100 x 50 x 6 mm, M.S. Electrode Ø 2.5 mm.

Tools:

Scale, Try Square, Hacksaw, Wire Brush, Welding Screen, Flat Tong, Gloves, Chipping Hammer, File & Welding M/C(Transformer) Etc.

Theoretical background: Scale: It is made of stainless steel and is use for measuring the length of the pipe and to make accurate marking where it is require.

a) **Hacksaws:** In welding hacksaw is use for cutting work pieces of metal into different sizes. It has fine toothed blade combined with C-shaped frame that hold it under tension.
b) **Try square:** - It's a wooden or metal working tool used for marking and measuring the work piece The square refers to the tool's primary use of measuring the accuracy of a right angle , to try surface is to check its straightness or correspondence to an adjoining surface.
c) **Welding machine transformer:** It is use to transform the power supply from moderate voltage and current into a high current and low voltage supply.
d) **Chipping hammer:** It is use to remove the extra material or spatter from the weld surface.
e) **Wire brush:** It is a brush consisting of wire bristles usually of medium carbon steel. It is use to clean surfaces and to create a better conductive area for electricity.
f) **Welding screen:** It is use by the welders during performing welding. It protects the eyes from the harmful UV rays generating from the welding torch.

g) **Flat tong:** It is used to hold and lift the work piece instead of holding them directly with hands.

h) **Gloves:** It is use during welding because they protect our hands against any sort of contact with heat or mechanical aggression. Its main role is to protect from the molten metal and heat given off by welding gun.

Procedure: -

PRO 1:

1.1: Take the M.S. plate of 100 x 50 x 6 mm dimension by using scale.

1.2: Cut the 2 pieces of 50 mm with hacksaw.

1.3: Hold the one piece of plate in a vice & prepare all edges to 90° with filling.

1.4: Repeat same operation for the remaining plat & maintain it in equal size.

1.5: Remove burr of all edges.

PRO 2:

2.1: Take two plates, set the 'Lap' joint as per show in dig.

2.2: Start the welding machine & set the current 70 amps.

2.3: Take the electrode Ø 2.5mm & hold it in the electrode holder.

2.4: Do tag weld at the corner of joint.

2.5: Welding is then carried out throughout the length of the Lap joint

PRO 3: Clean the tag weld with help of chipping hammer & wire brush.

PRO 4: Use welding screen and flat tong as a safety instrument during welding process.

Precaution: -

1) Use the tong for lifting hot job.
2) Use welding screen, hand gloves while welding.

Result and discussion:

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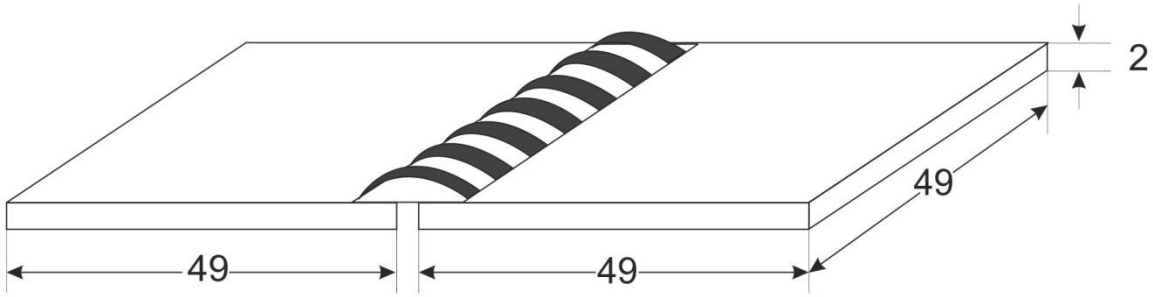
BUTT JOINT By Gas Welding



Butt Joint

Butt Joint by Gas Welding

Aim: To make **Butt Joint by Gas Welding**

Objective:

After performing the practical, the learner will be able to:

PRO1: Use of scale, hacksaw, files

PRO2: Know and practice how to use Gas welding Equipment and its various components.

PRO3: Know about the use of cleaning tools like chipping hammer wire brush etc.

PRO4: Know the specific use of oil can, welding Goggle and flat tong

Material:

M.S. Plate of 100 x 50 x 2 mm, C.C.M.S. Electrode Ø 1.6 mm.

Tools:

Scale, Try Square, Hacksaw, Wire Brush, Welding Goggle, Flat Tong, Hand gloves,, Chipping Hammer, File & Oxy – acetylene welding outfit, Etc.

Theoretical background:

a) **Scale:** It is made of stainless steel and is use for measuring the length of the pipe and to make accurate marking where it is require.
b) **Hacksaws:** In welding hacksaw is use for cutting work pieces of metal into different sizes. It has fine toothed blade combined with C-shaped frame that hold it under tension.
c) **Try square:** - It's a wooden or metal working tool used for marking and measuring the work piece The square refers to the tool's primary use of measuring the accuracy of a right angle , to try surface is to check its straightness or correspondence to an adjoining surface.
d) **Chipping hammer:** It is use to remove the extra material or spatter from the weld surface.
e) **Wire brush:** It is a brush consisting of wire bristles usually of medium carbon steel. It is use to clean surfaces and to create a better conductive area for electricity
f) **Welding Goggle:** It is use by the welders during performing welding. It protects the eyes from the harmful UV rays generating from the welding torch.
g) **Flat tong:** It is use to hold and lift the work piece instead of holding them directly with hands.

h) Gloves: It is use during welding because they protect our hands against any sort of contact with heat or mechanical aggression. Its main role is to protect from the molten metal and heat given off by welding gun.

Procedure: -

PRO 1:

1.1: Take the M.S. plate of 100 x 50 x 2 mm dimension by using scale.

1.2: Cut the 2 pieces of 50 mm with hacksaw.

1.3: Hold the one piece of plate in a vice & prepare all edges to 90° with filling.

1.4: Repeat same operation for the remaining plat & maintain it in equal size.

1.5: Remove burr of all edges.

PRO 2:

2.1: The given work piece are thoroughly cleaned, i.e., rust, scales are removed

2.2: The joining work pieces are positioned properly.

2.3: Acetylene valve on the torch is opened slightly and lightened with the help of a spark lighter.

2.4: Now acetylene valve is opened to get required the flow of acetylene.

2.5: Oxygen valve is opened till the intermediate flame feather reduces into inner cone to get a neutral flame.

2.6: The torch tip is to be positioned above the plates so that white cone is at a distance of 1.5mm to 3mm from the plates.

2.7: Torch is to be held at an angle of 30^0 to 45^0 to the horizontal plane.

2.8: Now filler rod is to be held at a distance of 10mm from the flame and 1.5 mm to 3 mm from the surface of the weld pool.

2.9: As the backward welding allows better penetration, back ward welding is to be used.

PRO 3: After the completion of welding, slag is to be removed by means of chipping Hammer, wire brush.

PRO 4: Use welding Goggle and flat tong as a safety instrument during welding process.

Precaution: -

1) Use the tong for lifting hot job.
2) Use welding goggle, hand gloves while welding.

Result and discussion: