

**CONSTRUCTION SKILLS TRAINING**  
**INSTITUTE**

**SKILL STANDARDS**

**WELDING**



**LARSEN & TOUBRO LIMITED**  
**ECC - DIVISION**

## GENERAL DESCRIPTION

A welder joins two typical or different metals in physical chemical and metallurgical properties. The weld joint thus produced shall be defect free and sound in nature as per national and international specification.

## SPECIFIC DUTIES

1. Takes the job allocation from site supervisor.
2. Checks the welding Equipments for proper connection and polarity.
3. Collects the required consumables, tools and tackles for the work.
4. Performs the welding as per specification.
5. Welding as per qualified position and given fit-up.
6. Welds defect free weld joint and negligible weld repair.
7. Able to identify the different material specifications and fusion electrodes.
8. Understands how to repair the weld joints.
9. Understands pre – heat and post heat requirements.
10. Works at heights uses ladders and scaffolds.
11. Works responsibly and safely without endangering others.
12. Understands electrode baking and holding procedures.
13. Avoids Consumable Wastages.
14. Able to understand repair tracings and remove weld defects.

## SKILL STANDARDS – WELDING

### KNOWLEDGE

WELDER LEVEL – I (STRUCTURAL WELDER - 1G, 2G, 3G, 4G - SMAW) MUST

1. Be-aware of Safety requirements and precautions necessary for the implementation of welding work.
2. Aware of various welding equipments and accessories used in SMAW.
3. Have basic awareness with regard to the welding symbols and electrodes.
4. Aware of different metal joining methods used in industry.
5. Aware of different basic ferrous and nonferrous materials.
6. Aware of consumables storage and handling .
7. Through knowledge about various positions in welding.
8. Shall be able to avoid distortion by following sequences, fixing clamps and using proper size of electrode.
8. Aware of volt and amps requirements for various size and type of electrodes.
9. Aware of Pre-heating, Post heating and PWHT requirements.
10. Aware of simple NDT techniques like DPT, MPT.
11. Aware of various welding defects and its remedy.

## SKILL STANDARDS – WELDING

### SKILLS

WELDER LEVEL – I must be able to

1. Uses the welding equipments and accessories properly and safely.
2. Select cables, Electrode – holders and earth clamps of the right capacity and makes proper connection.
3. Makes the fit up with proper root gap and proper distortion allowance.
4. welds in specified parameter and position.
5. In different position uses different parameters to Control the molten metal and slag.
6. Inspects and ensures the welds are of specified size and free from defects.
6. Reduction in Consumable wastages and optimum usage of consumables.
7. Techniques to avoid occurrence of welding defects and elimination of welding defects.
8. Analytical skills to find misalignment in fit-up stage to avoid weld repairs.
7. Basic operative techniques of simple NDT methods such as DPT.

## **SKILL STANDARDS – WELDING**

### **KNOWLEDGE**

WELDER LEVEL – II (PIPE WELDER 1G - SMAW)

In addition to the knowledge items outlined above Level – II must

1. Able to describe the method of pipe welding.
2. Aware of different types of joints and grooves used in pipe welding.
3. Aware of different types of electrodes used in pipe welding.
3. Aware of methods of welding pipes in 1 G position.

### **SKILLS**

In addition to the Skills items outlined above Level – II must able to

1. Tack welds the pipe for butt-welding.
2. Makes root run by rotation method.
3. Makes filling run by rotation.
4. Inspects the job for surface defects.

## **SKILL STANDARDS – WELDING**

### **KNOWLEDGE**

WELDER LEVEL – III (PIPE WELDER 5G & 6G - SMAW)

In addition to the knowledge items outlined above Level – III must

1. Aware of different position in pipe welding.
2. Aware the method of edge preparation and alignment.
3. Aware the method of tack welding and root pass deposition, further pass deposition.
4. Aware of start and end point, and welding sequence to avoid distortion.

### **SKILLS**

In addition to the knowledge items outlined above Level – III must able to

1. Prepare the edges.
2. Align and tack welds the pipe.
3. Deposits the root pass.
4. Clean and deposit subsequent passes.
5. Clean and inspects for defects.

## **SKILL STANDARDS – WELDING**

### **KNOWLEDGE**

A PIPE WELDER – LEVEL IV (GTAW +SMAW) Must

In addition to the knowledge items outlined above Level – IV must

- 1.Aware of principles of GTAW.
- 2.Aware of equipments and accessories used in GTAW and their functions..
- 3.Aware of different type of inert gases and applications.
- 4.Aware the parameters of GTAW.
- 5.Able explain the applications, advantages and limitations of GTAW.
- 6.Aware various consumables used at GTAW process.
- 7.Visual inspection of welds.
- 8.Aware of various defects and its remedy.

### **SKILLS**

In addition to the Skills items outlined above Level – IV must able to

- 1.Prepare the edges.
- 2.Align and tack welds the pipe.
- 3.Deposits the root pass with GTAW.
- 4.Able to checks the root penetration
- 5.clean and deposit subsequent passes with SMAW.
- 6.Clean and inspects for defects.