



**COURSE MANUAL: *STAINLESS STEEL TIG-WELDING***  
***MODULE 6***

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## MODULE 6

### Objective:

The candidate shall know the principles of arc welding.

The candidate shall know how the equipment for arc welding works.

### Extent:

- Basic electricity training.
- Electric light arc.
- The light arc as a source of heat.
- The forces in a light arc.
- Basic terminology of welding (bottom layer, top, root, penetration, etc.).
- Welding processes (MMA, MIG/MAG, TIG).
- Additives.
- Material transition, weld pool.
- Creation of the weld pool.
- Power source, net voltage.
- Power sources from the net.
- Transformers, use of AC.
- Rectifiers for DC.
- Arc voltage and weld current.
- Type of current and polarity.
- Load, intermission.
- Shielding gas.
- Welding parameters.

### Expected result:

- Describe the principles of arc welding.
- Understand basic terminology.
- Be able to describe the term arc energy.
- Be able to describe the material transition through the light arc.
- Be able to describe the creation of the weld pool.
- Describe the main components of the weld equipment and its function.
- Describe polarity and change of polarity.

- Name important parameters for arc welding.

Material for module 6 can be found in the course book.

Also, use video material to study details in weld activities and material transfers.

#### *Control of assembly before tack weld.*

- Control that there is no fluctuation between the plates. Usually, there should be defined a maximum fluctuation of for instance 4 mm. If the sprawling is exceeded, the plate edge must be biased in the proportion 1:4.
- Control that longitudinal grooves are displaced with a minimum of 30 degrees if possible.
- Sprawling on tubes should not exceed 1.5 mm.

#### *Control before welding.*

- Check the welding equipment.
- Check for correct filler material.
- Check that equipment adjustment is according to WPS.
- Check for correct cleaning.
- Check that correct protective and safety equipment is available.

#### *General rules for applying tack weld.*

All tack welds being a part of the main weld shall be done with the same welding parameters as the main weld given in the WPS. Tack welds are usually 3 x the material thickness. When round iron is used for tack welds, the round iron must be of the same quality as the main material. The round iron is removed by grinding before welding.

In addition, the tack's start and stop, and slag is to be removed.

Length and number of tacks shall be adapted to the actual construction according to size and strapping.

Eventual igniting wounds shall be grinded, and the area should be checked with MPI.

If tack tiles are used, the work shall be completed according to approved WPS. When removing the tiles, they are cut 3 mm from the basic material, and the weld is grinded to later be controlled with MPI.