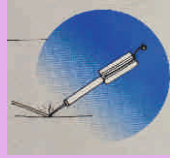


- Remove oil, grease, scale and clean the surface to be joined, before soldering.
- Avoid Chloride containing flux if not possible, use with care and neutralise with water immediately after completion of work
- Lead-Tin solders shall be used for general purpose jobs.
- Use Tin- Antimony or Tin- Silver solders for food handling and other non-toxic requirements.



POST WELDING CLEANING

- All discoloration, weld spatter, flux/scale are to be removed.
- Use stainless steel wire brush exclusively
- Only dedicated grinding wheels and discs are to be used.
- For chemical cleaning, pickling formulations based on nitric acid and hydrofluoric acid are to be used.
- For passivation, use nitric acid formulation.
- Through washing is to be done with water immediately after pickling/passivation.



Regular Maintenance

Dirt deposits on stainless steel, including finger marks and identification markings are easily removed by warm water with or without detergent. Mild non-scratching abrasive powders such as household cleaners can be used with warm water, brushes, stainless steel brushes, sponges or clean clothes. Carbon steel brushes or steel wool should be avoided. Cleaning should always be followed by rinsing in clear hot water. If the water contains mineral solids which leave move spots, the surface could be wiped with dry towels gently.

For further details please contact:



Indian Stainless Steel Development Association

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STAINLESS STEEL FABRICATION



Dos &
Don't



INTRODUCTION

Stainless steel entered the Indian Industry in early sixties. Though its usage is steadily increasing over the years a complete understanding of its properties, behaviour pattern, fabrication and inspection techniques has not spread over the entire spectrum of users.

Salem Steel plant has been working in its direction since its commissioning in 1981. Various technical literature covering product application, fabrication, etc has been brought out.

Certain precautions if taken while fabrication using different techniques can help the user get maximum advantage from use of stainless steel. One may encounter several problems while fabrications/manufacture to ensure a quality end product. Problems may crop up at different stages like storage, cutting and sizing, forming, welding, brazing, soldering etc. This booklet illustrates these points. Whenever basic problems are faced, do contact Salem steel or necessary technical assistance.

STORAGE

- Always store in a dry area, separate from carbon steel.
- Use stainless steel or wooden racks for stacking.
- Take care to avoid dirt, dust and greasy deposits on the surface.
- The ink used for marking shall be free from chloride, sulphur and lead.



CUTTING AND SIZING

- Oxy-Acetylene/Oxy-Hydrogen process is not practicable.
- Use Guillotine Shear for cutting (Wipe blade and hold down pads to remove iron contamination).
- Plasma Arc/ Powder cutting is also possible.
- Remove discoloration of the cut edge by grinding or passivation.

FORMING

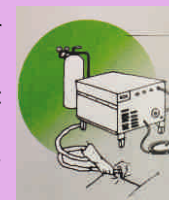
- Use fully annealed material for best results while forming
- To Facilitate smooth draw, use self-lubricating dies like Alu-Bronze (Copper-76%, Aluminium-16%, Iron-5%, Others-3%).
- Use paste/ emulsion lubricants for severe draw.
- Hydraulic test is preferred for precision work



- Limit first stage reduction to :
 - Austenitic : 40 to 45%
 - Ferritic : 30 to 35%
- Inter-anneal to avoid work hardening.
- Use higher Austenitic grades to reduce work hardening
- Use hot blanks (150 c) while forming ferritics.

WELDING

- Metal arc, MIG/TIG processes are practicable for welding stainless steel.
- For austenitic grades, use matching austenitic filler wire/electrodes of richer composition.
- For ferritic grades, use austenitic filler wire/electrodes.
- While welding stainless steel to other steels, use austenitic welding rod/filler wire
- Argon/ Argon + Hydrogen shielding gas to be used.
- Weld joint areas to be cleaned to remove dirt, grease etc.



THIN GAUGE WELDING

- Cutting burr should face the torch
- The wide light flanging at the joining areas.
- Pulsed heat input is advisable.
- Argon + Hydrogen shielding gas to be used.
- Low voltage, high current to be maintained.
- Automatic welding may be practiced to the extent possible.
- Use of grooved chilled bar and purging bottom area with inert gas will improve weld quality.



BRAZING

- In general, most of the stainless steel grades and finishes can be brazed successfully
- In case of highly polished finish, abrade the surface for better bonding.
- Remove all surface contaminations before brazing.
- Normally, silver/nickel base alloys are used as filler material
- Flux residue after brazing shall be removed by scrubbing with water.
- Heat affected areas are to be cleaned chemically.



SOLDERING

- Finishes like 2D, 2B, No.3, No.4 are amenable to soldering.
- Bright polished finishes are difficult to solder