

# Productivity and Quality Improvement of Weldments in Process Pippings used for Pharmaceuticals Application



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**Abstract:**

Tungsten Inert Gas (TIG) welding is fundamental in those industries where it is very essential to control the weld bead shape and its metallurgical characteristics. This paper covers process systematization in pipe butt welding processes which is very essential in custom engineering project process pippings used for pharmaceutical application.

Demands for improved productivity, efficiency, quality, continuous improvement of manufacturing process and customer requirements are great challenges to the welding industry. Welding is a core process for the fabrication industries. In this scenario, most of the mechanical fabrication industries are struggling to give the good quality and consistency of the process in manual TIG welding due to many reasons. Hence present work was undertaken. The customer's complaints for the year of 2012 were mainly in the area of On Time Delivery (OTD) due to welding rejections and reworks activities. To address this area there was a management directive to improve the Productivity and quality in the shop floor. The main objectives of selecting this project was to improve the productivity up to 40% and reduce the rejection from 16% to 2% in manual TIG welding of process pippings used in pharmaceutical application using PDCA approach and QC tools.

The final output of this project is process systemisation through new implemented fabricated conveyor for manual TIG welding to improved process pippings welding productivity up to 8 joints per hour (40%), dramatically reduce welding reworks and rejections from 16% to 2% and cost saving by elimination of non value added activities (NVA) up to 15%, with improving of customer satisfaction in quality and on time delivery.



**Manual hand rotator**



**Fabricated conveyor**



**Cause and effect diagram**

Type of Defect	Why?	Why?	Why?	Why?
Lack of Fusion	Incorrect Root Taper? Low Argon	Welding Parameters not followed as per Approved WPS	Lack of Awareness and Training	
Excess Weld Bead	The bottom of weld line torch movement	Excess gas due to incorrect torch movement	Operator Behavior	
Excess Penetration	Welding torch to be moved back to correct current	Excess to Manual torch of operator. As WPS not followed	Operator Behavior & Lack of awareness & Training	
Lack of Penetration	Incorrect Root Taper / Low argon	WPS not followed	Welding Parameters not followed as per Approved WPS	Lack of Awareness and Training
Inclusion	Presence of dirt	Stick on tungsten tip	Prohibited use of torch section	Prohibited use of torch section

**Why-why analysis**