

Research Paper :

Welding science the need of farmers for repair of farm tools

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ABSTRACT

Agricultural machines are largely fabricated, by village craftsmen and small-scale industries. Tractor, engines and oil mills are manufactured by organized sectors. The small-scale industries seldom have R/D facilities and they depend upon public institutions for the advance technology. This paper focused on the advance of arc welding technology e.g. electric arc welding, gas metal arc welding, tungsten arc welding, submerged arc welding etc, to improve the mechanical properties such as strength, ductility hardness etc., Microstructure, Heat-affected zone and welded structure of farm machines

Key words : Arc welding, Farm tools, Mechanical properties, Shielding gases

In the field of agricultural engineering as arc welding is applicable in various agricultural equipments like toothed spade, puddler, cultivator, tillage machine, plough, harrow, tractor cage wheel etc. Most of these equipments comes direct contact with soil that results maximum stress on the surface region in contact with soil, overall design, quality. Productivity of such equipments depends on the welded structures. The welded structures can be improved by proper selection of welding technique with controlling various welding parameters, material selection, welding electrodes, flux etc. Many researchers have worked and designed new techniques by adapting traditional harvesting to examine effect of prominent tillage packages comprising of different combination of tillage practices on rice residue incorporation in salty clay loam soil compared with conventional practice. Power tiller and tractor drawn improved equipment for seedbed preparation and sowing of lentil crop have been found efficient, high yielding and economical. And the design of seedbed preparation by using a pair of bullocks and a straw push-trough for direct drilling of wheat under paddy residue conditions. Farm machinery (except tractor and power tiller) as one of 836 reserved items are largely manufactured in small scale industries which employ common type of general purpose machine tools such as lathe, drill, grinder, milling, shearing arc welding etc. On agriculture machinery the fatigue cracks and failure commonly starts at weld. Welds are failed frequently at abrupt changes in geometry and usually aggravate the stress concentration (Das, 1997). The current study presents the application of welding techniques in the field of agricultural engineering for design development and

maintenance of farm equipments. The various arc-welding techniques discussed here are Electric arc welding, TIG, MIG, PAW, SAW etc. are the most efficient welding techniques used during fabrication. To improve the quality and overall productivity it is required to select the Shielding Gases for Welding. The purpose of shielding gas in GMA, FCAW or GTA welding process is to shield the weld pool and molten filler wire from atmospheric oxygen and nitrogen, The main gases used in the formulation of shielding gases are: argon, helium, carbon dioxide, oxygen, hydrogen. These gases form the basis of the mixtures used in the Agrosshield, stainshield and Specshield range designed to best meet the needs of welding technology. To stabilize the arc, provide the desired depth of penetration, and in GMAW, facilitate the required form of metal transfer. The functions affected by such factors as: material to be welded, process chosen, material thickness, metal transfer rate, material transfer mode, weld position, weld economics, type of electrode wire, finish required. All developed countries share a need for improved productivity in arc welding production much attention is being given to the means by which arc welding task may be mechanized or automated. Although technical, economic and social circumstances differ widely, successful Japanese and European developments in advanced welding have a number of common features. Broadly speaking these include the following aspects.

– *Product oriented development*:- a willingness to ask (and answer) basic questions regarding product function, design and production methods

– The use of appropriate rather than necessarily