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"DESIGN OF A PORTABLE FRICTION WELDING DEVICE FOR PLASTIC PIPES"

BY

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DESIGN OF A PORTABLE FRICTION WELDING DEVICE FOR PLASTIC PIPES

by

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SUMMARY

The main objective of this dissertation is to carry out a survey on existing methods for the welding of plastic pipes and in addition to choose the materials to design a portable friction welding device for plastic pipes. This machine will be based on a revolutionary friction welding method which refers to a range of techniques that rely on a relative motion between the thermoplastic parts to be joined. While a force is applied between them at the interface, the material is caused to heat and melt which will lead to the weld of the two parts.

The area of investigation is focused on the welding methods of plastics and in more thorough examination of the friction welding processes. This will lead to the best solution of the objective and by taking in consideration all the facts the machine will be designed. During my research I investigated an interesting device at CNE Technology which was the first machine of its kind that was build globally and gave results that were very impressive. My model is going to be pretty similar to it and it will be able to provide in industry faster throughput production times specifically when the work takes place out of the workshop.

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ABBREVIATIONS

FW: Friction Welding

FSW: Friction Stir Welding

PVC: Polyvinyl Chloride

PA: Polyamides

RPM: Revolutions Per Minute

FSSW: Friction Stir Spot Welding

FSP: Friction Stir Processing

RSW: Resistance Spot Welding

GTAW: Gas Tungsten Arc Welding

TWI: The Welding Institute

ABS: Acrylonitrile Butadiene Styrene

ASA :Acrylic-Styrene-Acrylonitrile

CA: Cellulose Acetate

CAB: Cellulose Acetate Butyrate

CAP: Cellulose Acetate Propionate

POM: PolyOxy-Methylene

PA: PolyAmide

PBT: PolyButylene Terephthalate

PC: PolyCarbonate

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