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UNDERWATER WELDING

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Abstract

The paper shows mechanism of underwater welding and investigation on welding technology. The section of material technology and welding at GDANSK University of technology (GUT) they are working for 25 year. This research on under water welding and weld place test the paper he most efficient method of underwater welding and show the which is most beneficial for under water welding methods. The underwater welding is unique process which integrate several on first slide contradictory phenomena as water or gas at high hydrostatic pressure , electricity and electric arc as heat source and metallurgical transformations during solidification of weld metal everything constricted in small sake sort time .all test has been performed with the use of self designed stands allows to perform well in self depth as well the depth up to 1000 meter the main research direction performed at section of material technology and weld are presented

Key words: *dry welding local cavity welding and weldability of steel under water welding wet welding.*

1. INTRODUCTION



The basic purpose of welding is to provide means to join the pieces by raising their temperature up to fusion point welding is the process to join the metal of similar and dissimilar metal with or without uses of heat and pressure we all know the basic information of weld in house hold purpose but many people are not aware of welding process which also take place in sea or sea. The review of modern underwater welding process is presented in current paper .the attention is focus on wet welding, dry welding and local cavity welding .the underwater welding methods are classified as follows

1. Wet welding
2. Dry welding
3. Local cavity welding

CLASSIFICATION OF WELDING

Under water welding can be classified in 3 main types

1.Wet under water welding: wet under water welding is consider as welding at surrounding pressure where there is a no mechanical obstacle between welder diver an surrounding water

2.Dry under wet welding :dry under water welding is consider as welding in dry surrounding atmosphere under atmospheric pressure were welder diver were welder diver is divided from surrounding water by means of mechanical obstacle which would be design according AWS in several alternative as follows

* dry welding in 1 atmosphere welding in pressure in which the pressure is reduced to one atmosphere not dependent of water depth

*the dry welding is occupy anted welding at surrounding pressure in large apartment for which factor was

displaced and where such atmosphere is archived that welder has no need to use diving apparatus

*dry apartment welding in surrounding pressure open bottom dry apartment that at least hold to head and shoulders of diver welder in low diving apparatus

*dry spot welding at surrounding pressure at small transparent gas fill ensure in diver welder outside in water.

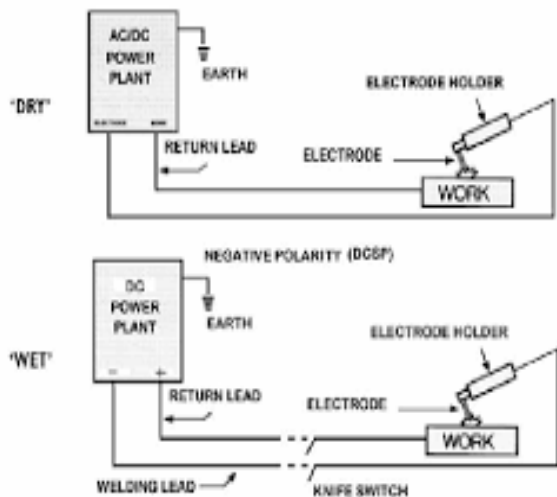
3. Local cavity welding: local cavity welding is impossible due to utilising standard instrument of automatic gas metal arc welding (GMAW)

2. TYPES OF SEA WELDING

Underwater Wet Welding

The underwater wet welding is elastic and uses of various types of underwater structure diver welder and electric arc in direct water environment which cause number of negative affect factor not only for wet quantity but also for welder safety this problem appear depth and their fore at the depth is a limiting factors when taking in account wet welding procedure cognitive process availability in wet welding wet welding cooling rate is high that those obtain in dry welding the temperature range for 800cto 500c it is change for 415c to 56c /c the piousness may be form by molecular hydrogen, carbon

monoxide or water vapour . Pours are present extent in all wet welds the main factors affecting this psychic dry water depth electrodes coating and arc stableness. Wet welding improve the quantity at last few year the mercantile agency available material electrode and flux wire of especial type insure good quantity of welding joint



The most commonly use welding methods is shaded metal arc welding and flux core arc welding including self ,shielded, flux core arc welding .including self , wet welding with the coated electrode is considered to be most cheap method of cognitive process in underwater environment Flaws conducted directly in water environment up to 101m in wet environment cooling rate is much higher than those obtained in dry welding the oil

pipe line it also use to apply wet repair on sea ship inside the wet weld the process is costly to operate shallow depth while it is found more easy when the press increase at considerable depth.

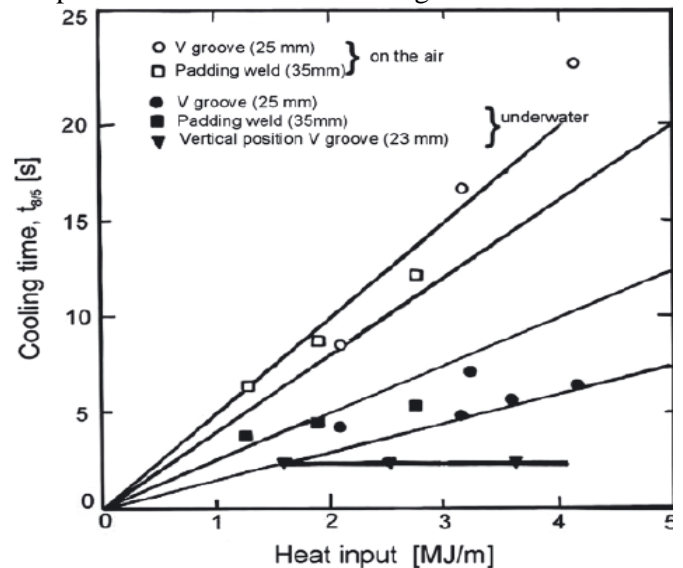
Uses of Wet Welding Process

Welding has become increasingly important at almost all manufacture ring industry and structural uses

- the advantage of underwater welding are large of an frugal nature because underwater welding for sea maintenance and repair job bypass
- It is also important methods for pinch repair, allows the damage structure to safety transport to in any facilities for perm ant repair
- The surface supplied air is the most common divergent methods for wet welding method

Dry Under Water Welding

Dry hyperbaric welding is preferred at surrounding pressure in apartment where water has been displaced with air or gas mixture dry welding are the better quantity than wet welding but it is costly than welding it mechanical property are equal to weld perform in air the cost of repairing of dry under water welding is high than wet welding the most commonly use dry underwater welding methods are SMAW,IMAW,DCAW,TIG and its limit in water is up to 350 meter depth the welder can easily sea and move the arc in inclusion by property adjutant off gun highly expert welders are required for dry wet welding how most be aware of safety care and high pressure problem this technique don not required large expansion dry apartment like use in wet welding on the other hand it also provides more quantity welds when compare to wet underwater welding



Uses of Under Water Dry Welding

1. Underwater Welding Is Applied In Sea uses and for the installation of sure oil pipe line
2. it also used to weld repair on sea sheep inside the wet process is costly to shallow depth while

it is found more pressure increase of considerable depth

“Gdansk university of technology , Gdansk 1985(in polish)

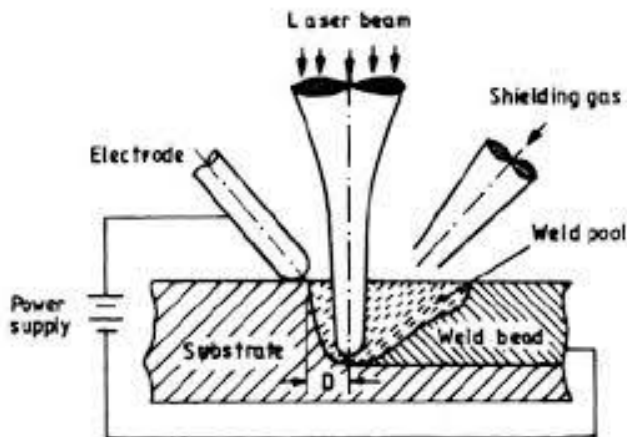
Local Cavity Welding Method

The local cavity method is possible due to utilisation standard equipment for semiautomatic gas arc welding GMAW Instrumented additional with special outer nozzle and elastic cover local cavity method cooling condition are nearly same as those existed during welding in an result of diffusion hydrogen determination state indicate that the amount of hydrogen in weld metal is in the range of 7 to 25 ml/101gm and deposited on welding parameter specially draw crate of shielding gas property of well performed with the use of local dry apartment are much better than the property of wet weld and met requirements of classification for society for depth up to 202m the main disadvantage of this method is lack of possibilities of welding process observation the local cavity process can also be proffered with uses of laser beam as a heat source

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Advantages Of Local Cavity Welding

1 the basic advantage of this method is to compare wet welding is remove of water from cavity by shielding gas

2 eclectic arcs is localised in an apartment fill by active or inert gas.

3 the heat distribution is significantly easier

4 faster cooling rate

3. CONCLUSION

In under water welding and inspection contiguous and scientifically arrange wok was necessary to provide results and cued be applied in real environment and practical task development of new welding technology, power source, diving equipment and filter material and significant improvement in welding training enable that high quality wet weld are produce under water weld and dry welding together with inspection development are in application of various autonomous operated system

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