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THE STUDY OF "SPECIAL FUNCTIONS" ON THE MECHANIC CHARACTERISTICS OF WELDED JOINTS

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PA position, 135 procedure, mechanical resistance, digital command, selection of the Eln characteristic line procedure

SUMMARY

This paper presents a concise history regarding the development of electric arc welding sources, the main functions with which 'INTELLIGENT RESONANT' type commanded sources are equipped, 'HYBRID' high productivity equipments, as well as the influence of certain functions on the features of the arc welded seam, respectively on the exploitation of welding equipments.

1. EXPERIMENTS

Experiments have been done at the UTS department within the UP Mechanics faculty, on the TSP-5000 sources for procedures 111 and 135, positions PA, PB and PF. The used parameters for the mentioned procedures and presented in table 1, while the welded samples are in figures 1, 2, 3, 4 and 5.

Table 1. Electric welding parameters.

Crt. No.	Param. / Procedure	Is [A]	Ua [V]	Vae [m/min]	Vs [cm/min]	Q [l/min]	Electrode diam. [mm]	Electrode type	Remarks
1	135-PA	100	21	2,8	20	15	1,2	G3Si1	Pulsing crt.
		200	26	8,0	30	18	1,2	G3Si1	Pulsing
2	135-PB	240	26,5	8,0	33	18	4,2	G3Si1	Pulsing
3	111-PB	175	24	-	14	-	4,0	superbaz	
4	135-PF	100	20	2,8	15	15	1,2	G3Si1	Pulsing
5	111-PF	110	22	-	12	-	4,0	superbaz	

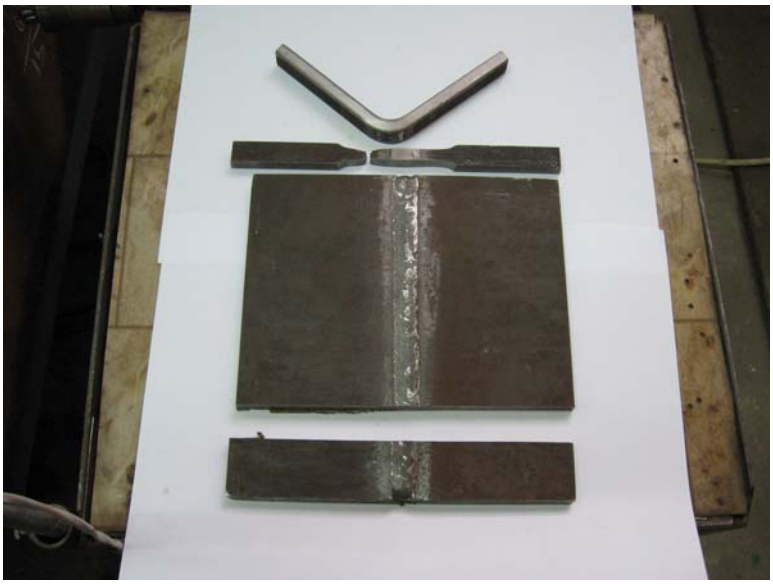


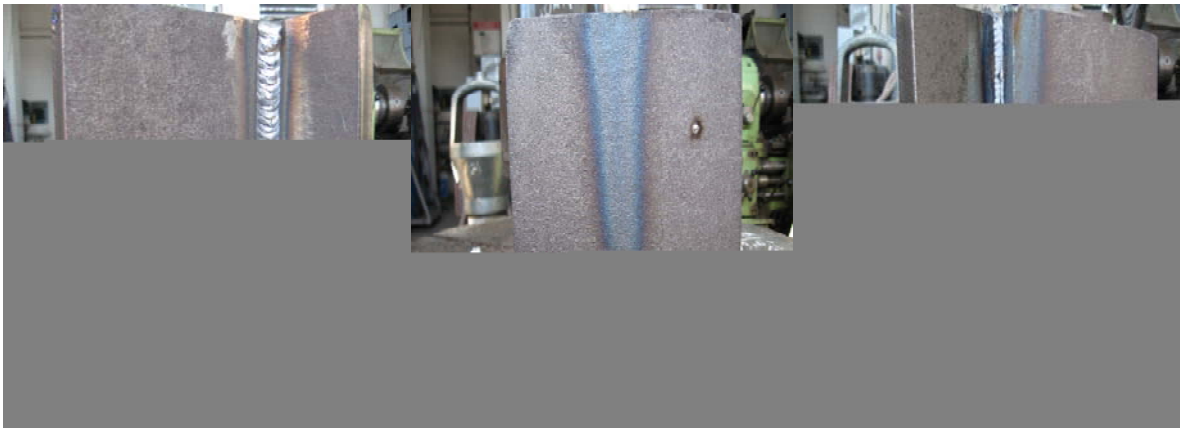
Fig.1 Sample procedure 135, position PA ; trial for pull and bend.

a b

Fig.2 Sample for procedure 135, position PB; a-welded, b-broken

a b

Fig.3 Sample for procedure 111, position PB; a-welded, b-broken



a b c

Fig. 4 Sample for procedure 135 – position PF, ascending corner: a- joining; b-thermic field; c-breaking

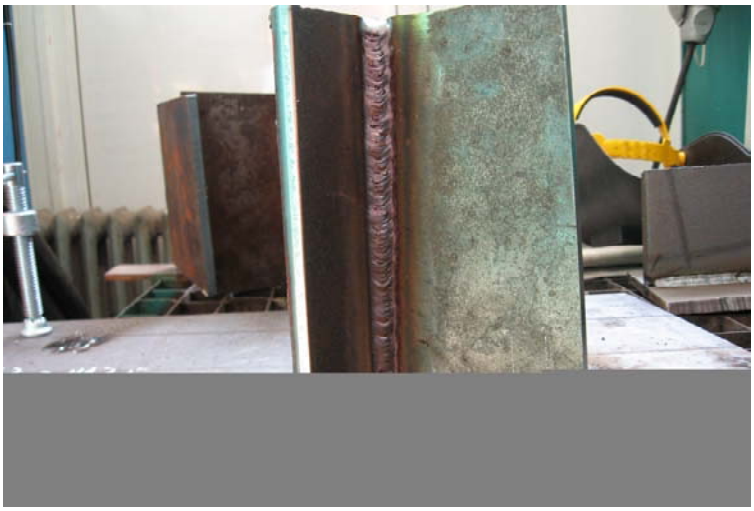


Fig.5 Sample procedure 111- position PF, ascending corner

2. CONCLUSIONS

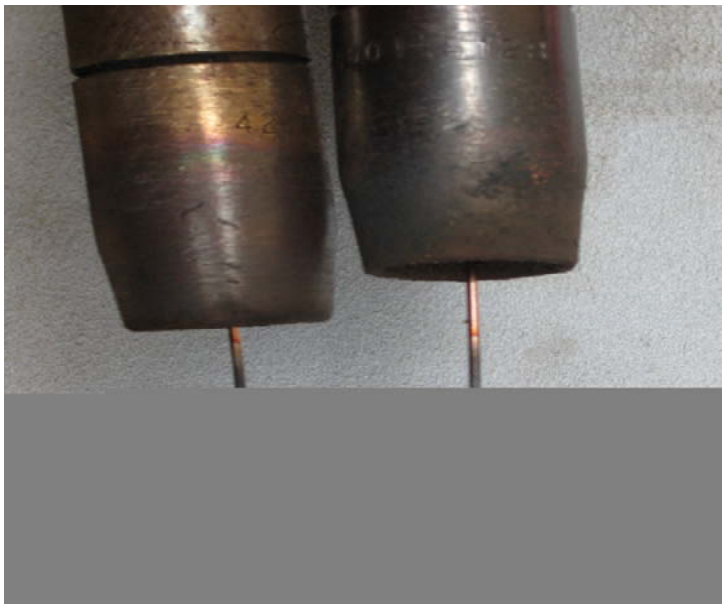
The current sources of the generation that uses adjustment by the „INTELIGENT REZONANT" variant are completely digital, commanded by micro-processors and ensure a high degree of flexibility.

These devices are « MULTI-PROCESS » and can be adapted to any situation.[4],[2]

If correctly programmed, these equipments can weld almost any kind of material and in any position, from PA to PG.

Experiments have proven the capacity of these equipments of being adjusted by the central control system, together with the digital signal processor that finally regulates the entire welding process.

The influence of the FI function over the interruption and re-start of the welding process is represented in figure 6.



a b

Fig. 6 Influence of the FI function on the electrode tip: a- ON; b- OFF

During the welding process, the five parameters of the synergic programme are continuously measured and other parameters can be corrected.[4],[1]

The equipment reacts, by the mentioned functions, to any modification of the welding process. Thus, one can obtain: a good and precise structure, where the results can be easily and exactly reproduced and easily exploited.[1],[2],[3]

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***SR EN 287-1; SR EN 1 Standards