"HENRI COANDA"
AIR FORCE ACADEMY
ROMANIA

GERMANY

"GENERAL M.R. STEFANIK"
ARMED FORCES ACADEMY
SLOVAK REPUBLIC

INTERNATIONAL CONFERENCE of SCIENTIFIC PAPER
AFASES 2011
Brasov, 26-28 May 2011

RESEARCH ON RECONDITIONING WELDING ROTOR COAL PULVERIZING MV

Adrian GALEA, Alexandru Livius VAS, Ionut ROMAN, Alexandru BANEA , TRIF Iacob-Nicolae

*SIM Faculty, Transilvania University of Brasov, Brasov, Romania

Abstract: *50 MV mill fan pallets reconditioning by welding machine, which provides power boiler with solid fuel (coal), used to produce steam that makes electricity and heat. During operation, the grinding of coal produces large breaks, parts of the whole plant in a central component of thermo-electric technology was used MIG-MAG welding that leads to sustainability of the equipment as long as possible.*

Keywords: *pallets, reconditioning, welding, mill, electrodes.*

1. INTRODUCTION

Within energy facility of thermal researches on improving their technical performance are done. A special aspect of the operational behavior of coal mills is the life of grinding elements, especially high intake of metals. Due to the aging phenomenon that occurs in the grinding process, but also due to an operating deficit, expenditure on repairs may have a higher percentage of the cost of energy produced. Wear by abrasion is characterized by the appearance of microplastic deformities and separation of thin metal, hard abrasive particles, which are located between the friction surfaces. Wear by abrasion depends on the physicochemical properties of the materials of construction parts, sliding speed and pressure during friction. Pallets are the building blocks of the mill fan and are designed to grind to a fine-grained coal and also a time of injection in the boiler through burners, the coal dust to achieve combustion with a constant heating temperature [2] .

2. PALLET RECONDITIONING

The paper presents attempts that were made by soldering pallet reconditioning mill MV fan 50, the component of power plants based on coal. Showing excessive wear and uneven pallets require reconditioning training before using the technologies: grinding and smoothing. Reconditioning procedures by welding are: [1]

- High alloy welding electrodes coated;
- Submerged arc welding wire and flux alloy electrodes;
- Welding flux cored wire;
- Submerged arc welding electrodes with or without additional heating multiples of some electrodes;

- Submerged arc welding electrodes or metallic tape laminated core band or tape sintered powder;
- Shielding gas welding electrode fuse (wire or core dust, MIG / MAG);

Values of base material participation MB for loading different welding processes is presented in Figure 1.

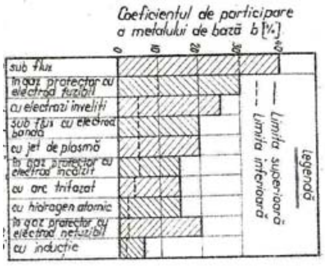

Fig. 1 Participation coefficient values for different methods of the base metal weld load.

Note that for welding submerged arc welding in shielding gas and electrode fuse large coefficient values are obtained for the participation of the welding base material so that greater dilution of base material alloy layers.

The most important advantage is the low participation shows the processes of base material that reduces the increase HAZ (heat influenced area) and its overheating. Also, here are obtained by dilution with the bath reduced the base material, weld metal properties can therefore be transferred loaded structures by welding a single or a small number of layers.

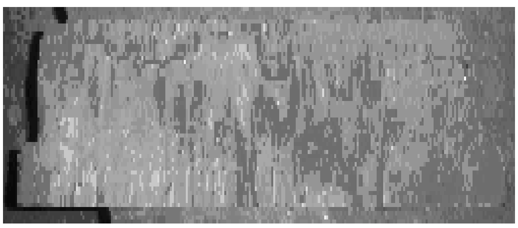

Figure 2 Pallets before reconditioning.

The following figures present reconditioning pallets before and after with coated electrodes, figure 2 and figure 3.

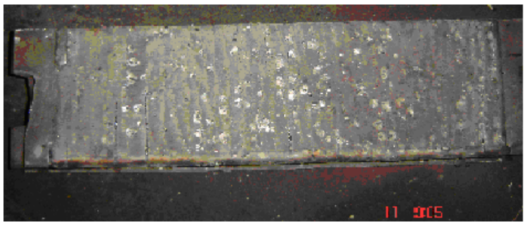

Figure 3 After reconditioning pallets with coated electrodes.

3. LOADING SAMPLES AND WELDELD EXPERIMENTS.

Currently, coal mills pallets are made by casting steel T 135 135 Mn in paper proposes the execution of S 235 mark material, STAS EN 10025-2:2004, S 355, EN 10025-4:2004.

Attempts have been made by the welding process with coated electrodes using five different types with the following brands: EI 350 H, 450 H EI, EI 58 H INOX 307, [4] LEDs 65. [5]

Samples were performed on materials derived from S 235, STAS EN 10025-2:2004, S 355, EN 10025-4:2004 thick welding and cooling 12 mm. After the welds were sectioned and polished samples for determinations.

Corresponding recommendations were given by using the next producer of welding parameters:

Table 1 Basic Material S 235:

Electro-de type	Is (A)	Ua (V)	Vs (cm/s)	Electro-de polarity	Elec-trod	Prehea-ting tempera-ture
EI 350 H	93 - 100	20-24	0,21	DC +	3,25	20°C
EI 450 H	98 - 111	24-30	0,12	DC +	3,25	20°C
EI 58 H	101 - 116	24-27	0,13	DC -	3,25	20°C
INOX 307	87 - 95	24-27	0,14	DC +	2,5	20°C
LEDURIT65	214 -	24-26,8	0,176	DC +	4	20°C

	223					

Table 2 Basic Material S 355:

Electro-de type	Is (A)	Ua (V)	Vs (cm/s)	Electro-de polarity	Elec-trod	Prehea-ting tempera-ture
EI 350 H	96 - 109	21,3-22,2	0,109	DC +	3,25	20°C
EI 450 H	98 - 109	22-24,7	0,15	DC +	3,25	20°C
EI 58 H	103 - 111	23,1-25,6	0,147	DC -	3,25	20°C
INOX 307	87 - 94	24-26,1	0.171	DC +	2,5	20°C
LEDURI T65	235 - 244	25-27,2	0,204	DC +	4	20°C

Based on metallurgical characteristics obtained for the steels investigated and given the qualities chosen for electrode reconditioning works envisaged for assessment technology that were taken into account these two types of loading by welding with coated electrodes.

Notations for values in the table 3 and 4 determinations are shown in figure 4.

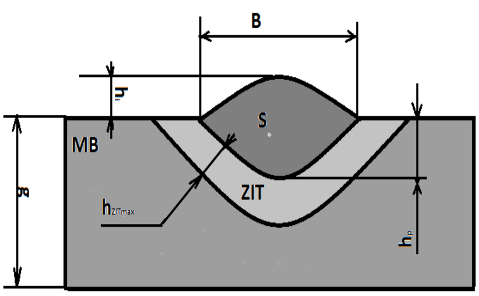

Figure 4. Representation of the notations in the tables, where:

hp - penetration on welding;
B - bead width;
hi - height increasing bead;
h_{ZITmax} - maximum height of ZIT;
g – thickness 12 mm;
ZIT - thermally influenced area;
s – welding;
HV_{03} - average hardness Vickers HV_{ZIT}; HV_{MB}; HV_s;

Table 3 Average hardness

Electro-de type	h_p	h_i	B	h_{ZIT}	HV_{ZIT}	HV_s	HV_{MB}
EI 350 H	0,7	3,3	10,5	3,8	458	764	233
EI 450 H	1,1	1,4	12,8	3,4	382	527	234
EI 58 H	2,3	2,3	14,1	3,8	450	776	317
INOX 307	1,9	1,6	11,3	2,4	279	395	237
LEDU-RIT65	1,8	3,4	18	6,3	625	764	217

Geometrical parameters obtained from the ribbons made by the representation in Figure 2 are presented in Table 3 for the base material S 235 and Table 4 for the base material S 355.

Table 4 Average hardness

Tip electrod	h_p	h_i	B	h_{ZIT}	HV_{ZIT}	HV_s	HV_{MB}
EI 350 H	0,9	2,2	8,9	1,2	632	758	223
EI 450 H	0,8	3,5	,12,5	2,8	437	549	244
EI 58 H	0,8	3,3	13,9	2,9	453	539	229
INOX 307	1	2,8	9,2	2,4	270	308	220
LEDURIT65	1,3	4,5	17	3,2	699	717	226

Evaluation of experimental results obtained leads to the following conclusions: Alternative loading technological LEDURIT65 filler materials based on S 235 and S355 provide an acceptable compromise between the hardness characteristics of the seams is recommended for reconditioning of the blade works.

4. CONCLUSIONS.

Hard facing welding shown is the best chosen method for the mill pallet reconditioning.

From the technological point of view chosen materials have demonstrated good resistance to corrosion and anti-friction wear.

Hard facing welding technology proposed has a good productivity and optimal material consumption.

The cost of the proposed welding recondition pallets is lower than obtained by casting the pallets.

5. REFERENCES.

[1]SCOROBETIU LUCIAN – WELDING OF ALLOY W, Cr, Mo, USED IN BUILDING USED FOR FORMING PLASTIC MOULDS USED TO HEAT. PhD thesis Timisoara Polytechnic Institute "Traian Vuia" TIMISOARA 1977

[2] A.Galea, L.Feraru, D.Floricel, I.N.Trif Reconditioning of surfaces subjected to intense wear, of pallets from the rotors of coal grinding mills, used in thermoelectric industry, through laser-hybrid process. BULGARIAN JOURNAL FOR ENGINEERING DESIGN, NO. 4, APRIL 2010, ISSN 1313-7530

[3] www.ductil.ro/

[4]www.s190317805.online.de/shop/article_10681/UTP-Ledurit-65.

5. ACKNOWLEDGEMENT

This paper is supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU/6/1.5/S/6

„ACKNOWLEDGEMENT: This paper is supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), ID76945 financed from the European Social Fund and by the Romanian Government.