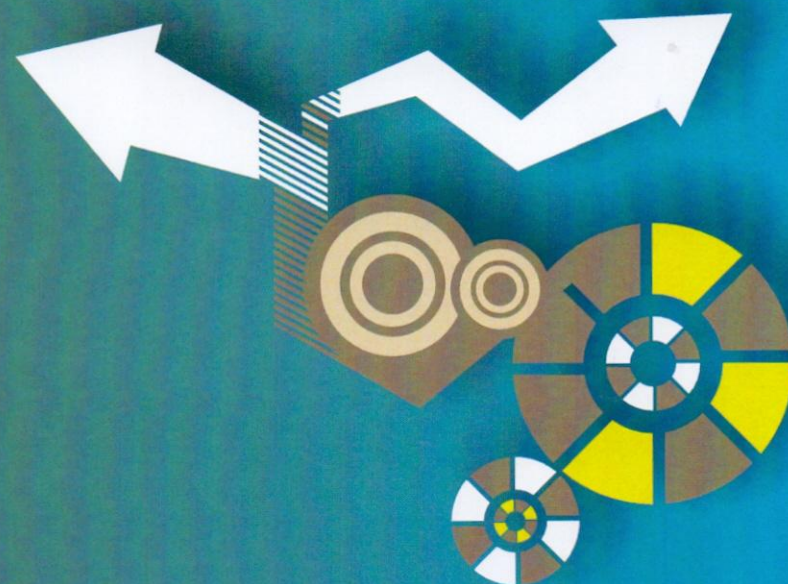


Jacek Pietraszek, Dorota Klimecka-Tatar

TECHNICAL ASPECTS OF MATERIALS QUALITY



CZĘSTOCHOWA 2016

ISBN 978-83-63978-34-1

Reviewers:

Dr hab. inż. Robert Ulewicz, prof. P.Cz– chapters 1 ÷ 6

Dr hab. inż. Witold Biały, prof. PŚ – chapters 7 ÷ 13

TECHNICAL ASPECTS OF MATERIALS QUALITY

JACEK PIETRASZEK KLIMECKA-TATAR DOROTA: **TECHNICAL ASPECTS OF MATERIALS QUALITY**: Monography/Jacek Pietraszak, Dorota Klimecka-Tatar – Częstochowa: Oficyna Wydawnicza Stowarzyszenia Menedżerów Jakości i Produkcji (SMJiP) 2016 – 203p. — ISBN 978-83-63978-34-1

© Jacek Pietraszak, Dorota Klimecka-Tatar, 2016

© Oficyna Wydawnicza Stowarzyszenia Menedżerów Jakości i Produkcji (SMJiP)

TECHNICAL ASPECTS OF MATERIALS QUALITY

MONOGRAPHY

EDITING AND SCIENTIFIC ELABORATION

JACEK PIETRASZEK

DOROTA KLIMECKA-TATAR

6.	THE INFLUENCE OF THE HEATING AND COOLING RATES ON THE TEMPERATURE OF THE PHASE TRANSITIONS	87
6.1.	Introduction	87
6.2.	Methodology	88
6.3.	Results	89
6.4.	Conclusions	97
	Bibliography	98
7.	THE POSSIBILITY OF REGENERATION PROCESS IMPROVEMENT OF CONVEYOR BELTS	91
7.1.	Characteristics and construction of conveyor belts used in mining	99
7.2.	The conveyor belts repair technology	103
7.3.	The production system improving of conveyor belts regeneration	108
	Bibliography	110
8.	POSSIBILITY FOR REALIZING SAVINGS BY APPLICATION OF THE HARD-FACING AS THE REVITALIZATION TECHNOLOGY OF VARIOUS MACHINE PARTS	111
8.1.	Introduction	111
8.2.	Procedure of prescribing the hard-facing technology	115
8.3.	Methodology for determination of the hard-facing profitability	120
8.4.	Analysis of profitability of the damaged parts revitalization	122
8.4.1.	Loader's teeth	123
8.4.2.	Blades for asphalt mixing	124
8.4.3.	Impact beams of the rock materials crusher	126
8.4.4.	Blades for clearing the vegetation overgrowth	127
8.4.5.	Terrain-leveling machine knives	129
8.4.6.	Trenching machine blades	130
8.4.7.	Snow plough blades	132
8.4.8.	Stone crushers hammers	133
8.4.9.	Forging press frame	135
8.4.10.	Toothed hub of the eccentric press	136
8.5.	Conclusions	138
	Bibliography	140
9.	DIFFUSION PROCESSES OCCURRING DURING PRODUCTION OF ALLOY LAYER ON STEEL CAST MOULDS	145
9.1.	Introduction	145
9.2.	Own research	146
9.3.	Test results	148
9.4.	Summary and conclusion	153
	Bibliography	154

10.	DETERMINANTS OF VISUAL CONTROL IN THE PRODUCTION OF PAVING STONES	155
10.1.	Characteristics of the subject and the object of study	155
10.2.	Manufacturing process of the paving stones in technological aspect	156
10.3.	Control in the manufacturing process of paving stones	159
10.4.	Presentation of the results of the selected set of factors in the BOST questionnaire	160
10.5.	Conclusion	163
	Bibliography	165
11.	QUALITY ASSURANCE DURING STEERING COLUMN ASSEMBLY PROCESS	167
11.1.	Introduction	167
11.2.	The steering column quality requirements and manufacturing assembly process	168
11.3.	Quality assurance tools deployment	171
11.4.	Summary	177
	Bibliography	178
12.	QUALITY INFLUENCE OF WELD SURFACE POST TREATMENT ON THE FATIGUE RESISTANCE OF WELD JOINTS	179
12.1.	Introduction	179
12.2.	Experimental work	181
12.3.	Results	182
12.4.	Discussion	188
12.5.	Conclusion	188
	Bibliography	189
13.	IDENTIFICATION OF PROBLEMS IN IMPLEMENTING ISO 9001 ON THE EXAMPLE OF THE COMPANY MANUFACTURING POLYPROPYLENE FABRICS AND YARNS	191
13.1.	Introduction	191
13.2.	The main aim of ISO 9001	193
13.3.	Amendment of ISO 9000 in 2015	196
13.4.	Identification of problems	198
13.5.	The way of solving problems on the example of the company manufacturing polypropylene fabrics and yarns	200
13.6.	Summary	201
	Bibliography	202

Author Index	203
---------------------------	------------

Chapter 8

Dušan Arsić^{1,}, Vukić Lazić¹, Ružica Nikolić^{1,2}, Milan Mutavžić³, Aleksandar Sedmak⁴, Branislav Hadzima²*

POSSIBILITY FOR REALIZING SAVINGS BY APPLICATION OF THE HARD-FACING AS THE REVITALIZATION TECHNOLOGY OF VARIOUS MACHINE PARTS

Abstract: This Chapter is aimed in presenting the importance of hard-facing as the manufacturing technology, which nowadays is used increasingly for revitalization of the responsible plants and the machine parts. The reason for such development lies in multi-folded advantages that the hard-facing could provide, which could be observed from both the technical and economical point of view. Here is presented a procedure for prescribing the optimal technology for reparation of various technical systems with special reference to possible savings in money and time that could be realized by application of that technology. Costs and savings for reparation of various complex machine parts are analyzed by the profitability method. All the analyzed machine parts were revitalized by hard-facing, with substantial savings in money and machines' downtimes. Evaluation and verification of the hard-facing technology quality was done both experimentally and by monitoring the performance of the repaired parts in exploitation. The realized savings, calculated according to the profitability method, are presented by concrete monetary amounts for each analyzed working part, compared to costs of procuring the respective new part. In general, this Chapter can be considered as the voluminous techno-economic analysis of hard-facing as the revitalization technology of various machine systems.

Keywords: revitalization, technology, hard-facing, costs, savings, profitability.

8.1. Introduction

The objective of this Chapter is to point out the possibilities for application of hard-facing as one of the leading technology in

¹⁾ Faculty of Engineering, University of Kragujevac, Sestre Janjić 6, 34000 Kragujevac, Serbia; *corresponding author: dušan.arsic@fink.rs

²⁾ Research Center, University of Žilina, Univerzitná 1, 010 26 Žilina, Slovakia

³⁾ High Technical School, 24. November nn, 38218 Leposavić, Serbia

⁴⁾ Faculty of Mechanical Engineering, University of Belgrade, Kraljice Marije 16, 11000 Belgrade, Serbia

