



**ABRASIVE BLASTING –  
TECHNICAL ASPECTS AND ECONOMIC OF THE PROCESS BASED ON MANY  
YEARS OF WORK WITH PRODUCERS OF STEEL STRUCTURES**

mgr inż. Andrzej Brandt

Agencja Anticorr Sp. z o.o.

Keywords: corrosion, equipment, abrasive blasting, economics

**Abstract**

There is a constant modernization of equipment for cleaning metal surface in steel structure factory. That is driven by desire to reduce production cost. At the same time manufacturers are complied with high environmental protection requirements and substrate preparation standards under protection coatings. We can observe that the main improvements are related to cleaning equipment with metal abrasives. Due to health and safety regulations and environmental protection this particular process is done in isolated rooms.



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## **LOGISTIC IN THE ANTICORROSION WORKS**

Agnieszka Królikowska

Polskie Stowarzyszenie Korozyjne

Keywords: anticorrosion protection, competitions for anticorrosion works, specifications of anticorrosion works

### **Abstract**

The problems connected with an appropriate timetable and location for anticorrosion works in the construction process is described. Deficiencies in the documents and requirements governing the implementation of these works are shown.



## **WHY ARE ACOUSTIC SCREENS CORRODING?**

Agnieszka Królikowska\*, Leszek Komorowski \*

Jerzy Noworyta\*\*

\*Instytut Badawczy Dróg i Mostów

\*\*Przedsiębiorstwo Usług Technicznych OMEGA Sp. z o.o.

Keywords: acoustic screens, anticorrosion protection

### Abstract

The causes of the acoustic screens' corrosion protection deterioration are described in this paper (including improper washing). Recommendations allowing to obtain higher durability of these structures are shown.



## **ELECTROCHEMICAL CORROSION TESTS – PROBLEMS OF RESULTS INTERPRETATION**

Andrzej Królikowski

Wydział Chemiczny, Politechnika Warszawska

Keywords: corrosion, field test, electrochemical techniques, results analysis, mistakes

### Abstract

Electrochemical techniques are widely used for corrosion tests in laboratory and field conditions. These are measurements of characteristic potentials, current densities and impedance parameters. Guidelines for the arrangement of experimental conditions of these tests are presented. Basic interpretation problems of electrochemical measurements results, arising from overestimation of information provided, instantaneous nature of taken parameters, nonuniformity of corrosion attack and limited repeatability of these tests, are shown. Possible consequences of interpretation pitfalls are indicated.



## **COMPARATIVE STUDY OF STEEL REINFORCING BARS VERSUS GALVANIZED REINFORCING BARS' ADHESION TO CONCRETE**

Artur Rusin

Ocynkownia Śląsk Sp. z o.o.

Keywords: reinforcing bars, reinforced concrete, galvanized reinforcing bars adhesion to concrete, prolonging durability of reinforced concrete construction, reinforcing bars corrosion.

### Abstract

One of the methods for prolonging durability of reinforced concrete construction is using galvanized reinforcing bars. PTC (Polish Galvanising Association) ordered Institute of Building Materials and Structures Cracow University of Technology to conduct a comparative study of steel reinforcing bars versus galvanized reinforcing bars' adhesion to concrete. The subject of this presentation is to show the results of this study i.e. adhesion of steel rebars and rebars protected with anticorrosion zinc layer, the so called "galvanized rebars". The influence of galvanizing on adhesion was to be examined.



## **CORROSION PROTECTION OF FREIGHT WAGONS ACCORDING TO EU AND VPI REGULATIONS**

Ewa Kordalewska

Wagon Service Ostróda Sp. z o.o.

Keywords: EU, corrosion, freight wagon, regulations, VPI

### Abstract

In this paper, there are presented EU regulations and guidelines for the corrosion protection of freight wagons. There are discussed requirements for paint coating of particular construction elements of freight wagons.



## **EXAMPLES OF ALIPHATIC POLYURETHANE TOPCOATS PREMATURE CHALKING**

Jacek Bordziłowski

CES, 80-308 Gdańsk, Jasia i Małgosi 7A

Keywords: Coating chalking, polyurethane coatings, nitrogen oxides

### Abstract

Four examples of premature chalking (after 2–5 years exploitation) of aliphatic polyurethane topcoats were presented. The paints were produced by four renowned paint producers and were used in different corrosion categories of atmosphere. The owners of the investment objects claimed the coating quality. The probable cause of the coating defect was discussed as well as the proposal how to avoid them.



## **THE ADVENTAGES OF NICKEL SLAG AS ABRASIVE FOR SHOT BLASTING**

Jarosław Kanasiewicz – PROFIMA Sp. z o. o., Warszawa

Marek R. Brzezinski - Instytut Mechaniki Precyzyjnej, Warszawa

Marek Marcinkowski – Piotrków Trybunalski

Keywords: shot blasting treatment, abrasive, abrasive properties, nickel slag, comparison with copper slag

### **Abstract**

The paper presented the state of research and experience concerning the implementation of a test of production of nickel slag abrasive in Poland. We compare some properties of this new abrasive with others abrasives from nickel slag and its advantage and in comparison with polish copper slag abrasive.





**REQUIREMENTS IN SCOPE OF CORROSION PROTECTION, COMPETENCE AND TRAINING OF PERSONNEL SUPERVISING AND EXECUTING CORROSION PROTECTION WORKS, WITH REFERENCE TO THE RESULTS OF THE KORRALL PROJECT**

Jerzy Kozłowski

SLV-GSI Polska Sp. z o.o.

Keywords: corrosion, EN 1090, Declaration of performance, Regulation (EU) No 305/2011, Welded Construction.

**Abstract**

The article presents purposes and tasks of partnership project KorrAll called “The agreement regarding training and knowledge transfer in the area of corrosion protection” realized within the framework of Leonardo da Vinci “Lifelong Learning Programme” co-financed by European Commission. It describes such activities performed within the project as: – determination existing methods of qualification in the area of corrosion protection – analysis of standards, proceedings and technical regulations – comparison of education and training in the project participants’ countries (DE, PL, RO) – analysis of methods for future transparency of qualifications and the ability to equalise the competence of personnel in Europe. The article presents results of the activities as well as the examples of the added value in relation to European cooperation.



**MATERIALS, EQUIPMENT AND TECHNOLOGIES  
FOR APPLICATION OF CORROSION PROTECTION OF INTERNAL SURFACES  
OF TANKS FOR LIQUID FUELS**

Jarosław Szczuka

International Paint Sp. z o.o.

**Abstract**

The paper presents issues on materials, equipment and techniques used for anti-corrosion protection fuel storage tanks with a fixed roof and floating.



## **THE APPLICATION OF MODERN METHODS OF THERMAL SPRAYING AS A KEY FOR HIGH PERFORMANCE COATINGS ACHIEVEMENT**

dr inż. Krzysztof Szymański\*, dr inż. Bożena Szczucka -Lasota\*\*, Marek Gdesz\*\*\*

\* TSC, Krzysztof Szymański, 41-403 Chełm Śląski, Błędów 14, [www.tscpowloki.pl](http://www.tscpowloki.pl)

\*\* Wyższa Szkoła Zarządzania Ochroną Pracy w Katowicach, 40-007 Katowice, Bankowa 8

\*\*\* Fabryka Kotłów RAFAKO S.A, 47-400 Racibórz, ul. Łąkowa 33

Keywords: coating, thermal spray, HVOF, wear, corrosion, erosion

### Abstract

Basic information about thermal spraying process and its varieties has been presented in the paper. The authors have pointed out the directions of thermal spraying methods further development. Selected info about coating materials used in the processes has been included. The need for using proper methods of quality control assessment has been emphasized.



## **EVOLUTION OF THE SURFACE PREPARATION TECHNOLOGY BEFORE ORGANIC COATINGS APPLICATION.**

### **WHAT WE HAVE FOR ALUMINUM 2000?**

Lech Kwiatkowski

Instytut Mechaniki Precyzyjnej, Zakład Korozji i Technologii Antykorozyjnych, Warszawa

Keywords: conversion coatings, phosphating, chromating, alternatives, protective properties, Al alloys, 2000 series

#### Abstract

A brief overview of the changes which have been noted for conversion coating technology since their introduction into industrial practice is presented. The most important reasons of the progress are related to the development of automation of industrial processes, especially in the automotive industry. A summary of alternative processes, chemical reactions leading to film formation is given and the potential use of these processes for the treatment of high-strength aluminum alloys is discussed. It is shown that the problems in obtaining effective corrosion protection are associated with a heterogeneous chemical composition, and the surface structure of these alloys. Based on the examples in the literature and results of own research it is demonstrated that a conversion coating surface treatment requires at present much more complicated technology usually in two-stage processes in which a special role plays an initial modification of intermetallic phases.



## **THE SOPHISTICATED AND PRO ECOLOGICAL METHODS OF SHOT BLASTING**

MAREK R. BRZEZIŃSKI, RAFAŁ LUTZE

\* Instytut Mechaniki Precyzyjnej, Warszawa

Keywords: Shot blasting treatment, roughness, blasting medias, anodize coatings, electrochemical corrosion studies.

### Abstract

The paper presented evaluation tests of efficiency shot blasting with non typical abrasive like soda, "cold ice" and plant corns as preparation before for example anodic coating or lacquered. The mechanical prepare surface of "light" metals like aluminium or magnesium alloys before anodic coating is target of this tests. On mechanical prepare we understand surface cleaning from solid or semi liquid waste materials and roughness homogenize. By electrochemical measurement were investigated results of treatment.



## **MODERN TECHNOLOGIES OF THE CHEMICAL SURFACE TREATMENT BEFORE PAINTING**

Marek Budziszewski

Chemetall Polska Sp. z o.o.

Keywords: chemical pretreatment, phosphating, nanotechnology, zirconium treatment, silan treatment

### Abstract

Traditional, known and used by the industry for many years, chemical surface treatment technologies before painting still fulfill their requirements very well, provides good paints adhesion to the substrate, and sufficient corrosion resistance. Unfortunately, the use of them in large-scale in industry, carries a heavy burden on the environment, due to the fact that these technologies are mainly based on the compounds of phosphate, and very often heavy metals, carcinogenic substances and poisons. The new requirements for the protection of the environment, the need of simultaneous surface treatment of various metals and reduction of production cost, meet increasingly marketed nanotechnology, based on ions of zirconium, titanium and silanes. These modern technologies of surface treatment for paint coatings will be the subject of presented paper.



## **DECIDING BETWEEN CONDUCTIVE OR NON-CONDUCTIVE IN THE TANK STORAGE MARKET**

Marcel de Haan, Michał Szarejko

PPG Coatings, Amsterdam

PPG Coatings, Gdynia

Keywords: corrosion, tanks, conductive coatings

### Abstract

In Poland, internal surfaces of liquid fuel tanks are protected using paints under the industry specific name of “conductive” (also in the English version of the term) or “antistatic” paints. The application of this type of paint coatings is required by the Notice of the Minister of Economy, item 1853 (the currently binding version of 14 August 2014). The application of this type of materials is also common in the Eastern part of the European Union (Baltic States), Belarus, Ukraine and partly Russia and China. In Western Europe there are cases of using conductive paints known mainly in Germany. Thus, we want to ask “why is this happening?” and subject that issue to discourse within the industry.



## **SIGNIFICANCE OF CORROSION PROTECTION EXAMINATION PERFORMED BY INDEPENDENT LABORATORY IN THE WORK OF INSPECTOR**

Magdalena Dyrda

Huta Pokój S.A.

Keywords: corrosion, laboratory, corrosion protection

### Abstract

The article shows how important is testing by independent laboratory the corrosion protection applied by manufacturer. There are presented advantages of the tests performed by third party laboratories. There are described reasons and situations which make necessary using this kind of services. There is given proposition of assistance in solving presented problems by third party independent laboratory services which makes inspections, supervision, approval and consultancy in terms of corrosion protection.





## **ROLE OF PAINTING INSPECTOR DEPENDING ON THE EMPLOYER AND ITS FUNCTIONS IN THE PROCESS OF INVESTMENT**

Michał Jaczewski

Tikkurila Polska S.A.

Keywords: corrosion, supervision, painting inspector

### Abstract

Painting work inspectors and specialists of corrosion protection are employed by various entities of the investment process. Depending on who is employing them and at what stage of the investment process, their role and capabilities may vary considerably. The paper discusses common cases of employment of inspectors, typical responsibilities and hazards arising from their place in the process of the implementation of the investment.



## **SURFACE PREPARATION FOR COATING DUST-FREE HYDRO-JET METHOD USING POLISH EQUIPMENT SANDBOT**

Marek Marcinkowski\*, Tomasz Daraszkiewicz\*\*

\*Specjalista Czystszej Produkcji – NOT Łódź, 97-300 Piotrków Tryb., Przedborska 36

\*\*Dyrektor handlowy: WJSP Poland Sp. z o.o. 82-300 Elbląg, Stanisława Sulimy 1

Keywords: Surface cleaning wet abrasive blasting, jet air - water – abrasive

### Abstract

The article presents the new Polish unit for wet sanding SANdBOT type patented by JetSystem from Elbląg, using three-phase working stream water - abrasive - air assisted with an additional stream of water, which enables more efficient sandblasting surface treatment of metal, concrete and others. Cleaner wet sandblasting steel, concrete, brick, road, stone, wood and antique. It is a device that allows a 95% reduction of dust emissions resulting from the blast area. When removing paint coatings from building structures is twice as fast as dry sanding, less damaging their structure and consumes about 45% less abrasive. Steel structures cleans with sand at a speed comparable with dry sandblasting. It describes the design, operation and performance, and technology as well as application area. The device allows dust-free, low-waste and efficient cleaning of technical surfaces and removing old paint coatings, applied in industry, construction and anti-corrosion work. Three times lower operating costs.



## **PROTECTIVE PROPERTIES OF COATING SYSTEMS IN NATURAL AND LABORATORY CORROSION ENVIRONMENTS**

Małgorzata Zubielewicz, Anna Ślusarczyk, Grażyna Kamińska-Bach

Instytut Inżynierii Materiałów Polimerowych, Oddział Farb i Tworzyw, Gliwice

Agnieszka Królikowska, Leszek Komorowski

Instytut Badawczy Dróg i Mostów, Warszawa

Keywords: corrosion, corrosion protection, coating systems, testing

### Abstract

The test results of protective properties of anticorrosive coatings systems used for bridge protection are discussed. The research was carried out directly on selected bridges exposed to C4/C5I environmental corrosivity category and in laboratory conditions. Coatings on the bridges were evaluated for chalking, blistering, flaking, cracking, rusting and adhesion. The electrochemical impedance spectroscopy (EIS) was used to test barrier properties. Laboratory tests covered physio-mechanical properties (adhesion, hardness, flexibility, impact resistance), resistance to corrosive environment (salt spray test, changing conditions) and to UV radiation. A high degree of correlation was found between results of the research carried out so far and the real behavior of coatings during long-time operation in natural corrosion environment C4–C5.



## **LIQUID PAINTS WITH METALLIC EFFECT APPLICATION IN THE INDUSTRY**

Paweł Lula

Tikkurila Polska S.A.

Keywords: metallic colors, appearance of the coating, touch up, painting equipment

### Abstract

The paper presents difficulties that may arise during the application of paints in metallic colors. Lists the key factors affecting the final appearance of metallic topcoat. The issue of choosing proper spraying equipment and touch-up painting method has been discussed.



## **DIRECTIONS IN PROGRESS OF THERMAL SPRAYED ANTICORROSIVE COATINGS**

Piotr Milewski

CORRHARD – Natryskiwanie Ciepne Warszawa

**Keywords:** metallizing, thermal spraying of anticorrosive coatings, corrosion protection, thickness of metallized coatings, metal spraying equipment, new coating materials.

### **Abstract**

The article discusses modern solutions of equipment for thermal spraying of anti-corrosive coatings that improve the economics of the process and shows the possible directions of research of new coatings for corrosion protection in the context of the so-called. heavy corrosion protection. Indicated probable cause of the synergistic effect of metalized and painted coatings as a contribution to the discussion on the directions of research. It also discusses the activities necessary for the wider introduction of thermal spraying for corrosion protection.



## **ŁAZIENKOWSKI BRIDGE RENOVATION USING ETHYL SILICATE HIGH ZINC COATING FOR STEEL STRUCTURE PROTECTION AGAINST CORROSION**

Robert Chrzanowski, Agnieszka Kulesza, Rafał Jędrasiak

Zarząd Dróg Miejskich w Warszawie

Keywords: anticorrosion protection, ethyl silicate coatings, Łazienkowski Bridge

### Abstract

The paper presents both the reasons and the range of the maintenance works on the Łazienkowski Bridge with regard to the selection of the coating system to protect the steel structure against corrosion. The advantages and disadvantages of the paint system and its impact on the implementation of the works is described.



## **CONCRETE RESIN – USE IN STRUCTURE**

Rafał Kasak

Instytut Badawczy Dróg i Mostów

Keywords: resin concrete, construction materials, surface protections

### Abstract

Concrete resin is a composite material, which is increasingly used in the construction industry throughout the world. Compared to traditional concrete it is characterized by a much higher resistance to the destructive impact of the environment. The paper will discuss the capabilities and characteristics that meet the above material.



## **INCREASE CORROSION PROTECTION REQUIREMENTS IN THE OFFSHORE MARKET FROM THE PERSPECTIVE OF THE CONTRACTOR**

Renata Wypych

Zamet-Industry S.A.

Keywords: corrosion, Norsok M-501, offshore.

### Abstract

Offshore industry is one of the most exposed to the risk of environmental disaster, also poses a number of risks to the health and safety of people working in it, hence the need to constantly increase the quality requirements in the production processes of the structures and equipment, and in the field of corrosion protection. Suppliers of equipment and services are scattered around the world, so there is a need for independent verification of the quality of products and services, and that can be achieved through ISO / TS 29001 certification.





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**ANTI-CORROSION PROTECTION OF UNDERGROUND MUNICIPAL AND  
INDUSTRIAL INFRASTRUCTURE - TECHNOLOGIES, STANDARDS AND  
REGULATIONS**

Wojciech Sokólski

SPZP CORRPOL Gdańsk

Keywords: underground infrastructure, anti-corrosion protection, cathodic protection

Abstract

The lecture is a review and has been devoted to modern anti-corrosion protection technologies of underground steel structures, mainly pipelines, tanks, also reinforced concrete objects operated in dense municipal and industrial development. Characteristic corrosion hazards have been discussed, to which described objects in the ground are subjected to, as well as external electric interactions - of tram and rail tractions and induced alternate currents from overhead high voltage power lines. Advantages and disadvantages have been discussed of the newest generation of insulation protective coatings on pipelines and underground tanks and their operation has been cathodic protection technology. As per the state of technology, underground infrastructure anti-corrosion protection principles have been illustrated by requirements of present standards. On this basis remarks and proposals of changes have been formulated in current regulations of the Polish Building Law.



## **APPLICATION WATERTIGHT CONCRETE FOR DURABILITY OF CONCRETE STRUCTURES**

Wojciech Świerczyński, Bartosz Gądecki

Sika Poland Sp. z o.o.

Keywords: corrosion, watertight, durability

### Abstract

Growing demands on the durability of concrete structures posed by the current standards for watertight structures, and exposed to a highly aggressive environment ground or strongly aggressively acting on the concrete media have led to the development of concrete technology that meets the requirements of Eurocode 2. Standards Eurocode combine unequivocally Designer, Contractor and producer of concrete inter-linkage design standards, regulations, and related products. The problem tightness relates primarily concrete structures, which are required to permanent tightness and a long period of serviceability design. Example is the construction of "White Box", bridges and engineering structures, liquid containers, silos or floor on the ground.



**MODERN METHODS OF HYDROCARBON FIRE PROTECTION WITH EPOXY  
INTUMESCENT PAINTS. DURABILITY, RENOVATION, TEST METHODS,  
PRACTICAL EXPERIENCE**

Wojciech Zych, Rick Perkins

Sherwin-Williams Protective & Marine Coatings, Bolton, UK

Keywords: hydrocarbon fire, cellulosic fire, jet fire, pool fire, intumescent paint, passive fire protection, hydrocarbon curve, cryogenic spillage, CUF, Corrosion under fireproofing

**Abstract**

The purpose of this paper is to introduce methods of hydrocarbon fire protection for the Oil and Gas Industry. The paper explains the types of different of hydrocarbon fires which exist, addresses the regulations, legal requirements and certifications which are required across the globe and looks at the methods of passive fire protection which are available, focusing on epoxy intumescent coatings. The durability of the fire protection is detailed together with assessment methods for durability and its usefulness in offshore and onshore applications. Particular attention is given to the problem of corrosion under fireproofing (CUF). A comparison has been made between epoxy PFP and cementitious solutions. The practical application of an epoxy intumescent coating is also outlined.



## **ANTI-CORROSION AND FIRE PROTECTION OF DRILLING AND PRODUCTION PLATFORMS IN TERMS OF STANDARDS AND REQUIREMENTS**

Zbigniew Niedziółka, Katarzyna Trocewicz

Gdańsk, SAFE Co. Ltd. Sp. z o.o.

Keywords: corrosion, standards, requirement, documentation, quality control

### Abstract

Anti-corrosion and fire protection are inherent in project of drilling and production platforms. Therefore they delay an influence of aggressive environmental factors, platforms are exposed to. This study includes a basic knowledge how platforms are designed and performed. It is worth highlighting that proper design and project documentation, professional performance and inspections can be performed only by qualified personnel who has big competences and experience. In addition an inevitable part of an effective co-operation in a field of anticorrosion and fire protection is a good will and an appropriate communication of all parties involved in a particular investment and performance according to current standards.