

SBORNÍK ABSTRAKTŮ XVIII. KONFERENCE PIGMENTY A POJIVA



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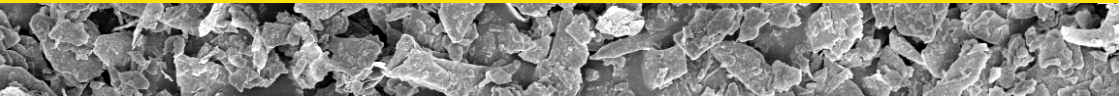
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SILICONE FORMULATION FOR FAÇADE COATINGS SILIKONOVÁ FORMULACE PRO FASÁDNÍ NÁTĚRY

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Summary

Silicone additives are widely used for the formulation of façade coatings, primarily to improve the water barrier properties.

After a short introduction to the silicone chemistry, we will see that two types of silicone are typically found in architectural coating formulations: linear polysiloxane and crosslinked silicone resin.

At least for cost optimization reasons, the water barrier properties, i.e. water uptake, water vapour permeability, beading, contact angle..., should be evaluated by varying the type and amount of each additives. We will show that water barrier properties are typically improving until reaching a plateau: above a certain dosage, the silicone additives will not improve water barrier properties anymore!

Typically, the best formulation candidates would then be exposed outside to evaluate their resistance to weathering and dirt pick-up. In this case, we will show that an excess of linear polysiloxane might even be detrimental to dirt pick-up. To optimize both the water barrier properties while maintaining a good dirt pick-up resistance, WACKER proposes a combination of linear polysiloxane with the less hydrophobic but more dirt pick-up resilient silicone resin.

The presentation will conclude with some surface analytical chemistry, which will show the influence of the UV radiation on coating surface compositions. It will also confirm that excessive linear polysiloxane concentrations increase the pick-up of atmospheric solid particles.



THE ENERGY ASPECTS OF TITANIUM DIOXIDE USE ENERGETICKÉ ASPEKTY VYUŽITÍ OXIDU TITANIČITÉHO

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Summary

Titanium dioxide (TiO_2) is a material with exceptional physical and chemical properties that enable its wide use in areas such as energy and environmental technology. The PRETIOX brand has significant potential for promoting renewable energy sources, improving the thermal comfort of building structures, and reducing the negative effects of the urban heat island (UHI).

Key words

Titanium dioxide, urban heat island, cool surfaces.

[Paper full text](#)



ENHANCING ZINC-RICH EPOXY ESTER COATINGS: OPTIMIZING CORROSION RESISTANCE WITH FUNCTIONAL PIGMENTS

ZLEPŠENÍ EPOXIDOVÝCH ESTEROVÝCH POVLAKŮ BOHATÝCH NA ZINEK: OPTIMALIZACE ODOLNOSTI PROTI KOROZI POMOCÍ FUNKČNÍCH PIGMENTŮ

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Summary

It was investigated how various particle kinds, sizes, and characteristics affected the mechanical and corrosion resistance of pigmented systems that contained spherical zinc. Members of the transition metal dichalcogenide (MoS_2) group, metallic pigments such as Al and Mg, conductive polymers such as polyaniline-PTSA, inorganic oxides such as MgO, organometallic anticorrosive pigment such as OP-Mg, and other semiconductor materials such as ZnS were employed in this study. These particles' multilayer, ultra-thin structure was designed to offer improved mechanical and anticorrosion properties. These particles' modes of action in heterostructure hybrid coating systems were clarified. Optimum dosage of these materials in combination with spherical zinc metallic pigments was to be determined with increased performance in chemical, corrosion and mechanical properties.

Key words

Conductive polymers; zinc, aluminium and magnesium metallic pigments; epoxy ester coating; organic anticorrosive pigments; inorganic oxides and sulphides; anticorrosion performance.

[Paper full text](#)



SOLUTIONS FOR TANNIN STAIN CONTROL: USE OF FUNCTIONAL PIGMENTS AND LIQUID INHIBITORS IN WOOD COATINGS

ŘEŠENÍ PRO KONTROLU SKVRN OD TANINU: POUŽITÍ FUNKČNÍCH PIGMENTŮ A KAPALNÝCH INHIBITORŮ V NÁTĚRECH DŘEVA

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Summary

Tannin staining is a common challenge in wood coatings, caused by the migration of polyphenolic compounds from wood substrates through paint layers. This presentation explores advanced solutions for controlling tannin stains using functional pigments and liquid inhibitors. It outlines the chemical mechanisms behind tannin migration and chelation, emphasizing the role of multivalent metal cations in stain inhibition.

The presentation compares traditional and new-generation pigment technologies, highlighting their effectiveness in tannin protection and their additional dual functionality, such as corrosion protection. Moreover, it introduces liquid inhibitors and demonstrates how they significantly enhance stain-blocking performance. Laboratory trials across various wood types validate the efficacy of these solutions, offering practical guidance for formulating high-performance wood coatings.



SUSTAINABLE ANTI-CORROSIVE SOLUTIONS: ZINC PHOSPHATE REPLACEMENTS AND LOW-VOC CORROSION & FLASH RUST INHIBITORS

UDRŽITELNÁ ANTIKOROZNÍ ŘEŠENÍ: NÁHRADY FOSFOREČNANU ZINEČNATÉHO A INHIBITORY KOROZE A BLESKOVÉ RZI S NÍZKÝM OBSAHEM TĚKAVÝCH ORGANICKÝCH SLOUČENIN

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Summary

This presentation introduces sustainable alternatives to traditional zinc phosphate-based corrosion inhibitors in coatings, addressing environmental concerns and regulatory pressures. It highlights the development of engineered zinc phosphate complexes with lower zinc content and zinc-free technologies, which offer effective corrosion protection with improved environmental profiles. Comparative performance data from salt spray tests and real-world applications demonstrate the efficacy of these solutions across various coating systems.

In addition, the presentation explores low-VOC corrosion and flash rust inhibitors, including a bio-based solution. These inhibitors provide multi-mechanism protection – flash rust, galvanic, and long-term corrosion – while maintaining good adhesion and compatibility with waterborne and solventborne systems. The results from laboratory trials and adhesion tests confirm their performance, supporting the transition to more sustainable and compliant coating formulations.

**ECO-FRIENDLY ADHESIVES BASED ON LIGNIN AND CASEIN:
TOWARD SUSTAINABLE MATERIAL ENGINEERING**
**EKOLOGICKY ŠETRNÁ LEPIDLA NA BÁZI LIGNINU A KASEINU:
SMĚREM K UDRŽITELNÉMU MATERIÁLOVÉMU INŽENÝRSTVÍ**

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Summary

Natural polymers such as cellulose, lignin and casein, derived from renewable resources, have been extensively investigated as sustainable alternatives to conventional plastics due to their biodegradability, biocompatibility, non-toxic nature, and broad availability. Both natural and synthetic polymers represent a versatile platform for the development of biomaterials applicable in the industrial and environmental contexts.

Among natural polymers, polysaccharides, starch, and lignin are particularly prominent. Their unique chemical structures and functional versatility have enabled a wide range of practical applications. This contribution focuses on the utilization of natural polymers – specifically lignin and casein – as fillers and binders in adhesive formulations.

A novel bio-based adhesive was prepared and tested for bonding paper and wood substrates. The mechanical performance of the bonded joints was subsequently evaluated to assess the adhesive strength and applicability of these natural components in sustainable material design.

Lignin and casein were tested as binder in a novel glue for used for gluing paper.

Mechanical properties of the bonded materials were measured.

Key words

Natural polymers; lignin; ethanol; bio-based adhesive; sustainability.

[Paper full text](#)



UV AGEING OF EPOXY RESINS FOR SURFACE PROTECTION OF MASONRY BRIDGES: ATR-FTIR AND GC-MS ANALYSIS

UV STÁRNUTÍ EPOXIDOVÝCH PRYSKYŘIC PRO POVRCHOVOU OCHRANU ZDĚNÝCH MOSTŮ: ANALÝZA METODAMI ATR-FTIR A GC-MS

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Summary

Epoxy resins are increasingly applied in conservation and strengthening works of masonry bridges, where they serve as binders, coatings, or adhesives. Their durability under outdoor exposure is critical, since ultra-violet (UV) radiation can initiate photochemical degradation. This study investigates the UV ageing of two epoxy resin systems, designated HEX and CH, in the context of their potential use for protective coatings in bridge rehabilitation. ATR-FTIR spectroscopy combined with GC-MS analysis was used to evaluate chemical changes after 1584 h of UV-A exposure. The HEX resin showed pronounced photo-oxidation, evidenced by strong carbonyl and hydroxyl bands and reduction of epoxy ring signals, whereas CH exhibited significantly lower degradation. GC-MS confirmed higher residual benzyl alcohol and lower antioxidant (BHT) content in HEX, correlating with inferior UV stability. The findings indicate that resin CH offers more reliable long-term performance for surface protection of masonry bridges exposed to natural weathering.

Key words

Epoxy resins, masonry bridges, UV ageing, ATR-FTIR, GC-MS, protective coatings.

[Paper full text](#)



ACRYLIC LATEXES FROM PLANT OIL-BASED MONOMERS AS BINDERS IN WATERBORNE FACADE PAINTS

AKRYLOVÉ LATEXY Z MONOMERŮ NA BÁZI ROSTLINNÝCH OLEJŮ JAKO POJIVA VE VODOU ŘEDITELNÝCH FASÁDNÍCH BARVÁCH

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Summary

The present paper deals with partially plant oil-based latexes synthesized from acrylated derivatives of rapeseed, sunflower, linseed, and camelina oil, and standard acrylic petroleum-based monomers (25 wt.% of the respective bio-based monomer in total monomer mixture) and their application as sustainable binders for waterborne façade paints. Latex-based paints are widely used in exterior architectural applications, primarily due to their excellent performance, ease of application, and aesthetic appeal. The key functional component is the latex binder, typically a waterborne polymer dispersion, that forms a continuous film upon drying and binds pigment particles to the painted surface. Through strategic chemical modification and emulsion polymerization techniques, plant oil-derived monomers represent high-performance building blocks in sustainable latex coatings. These modified plant oil derivatives were emulsified with the help of surfactants and polymerized under conventional emulsion polymerization conditions, forming stable latexes. These synthesized latexes were subsequently characterized and used to formulate façade coating systems. Façade coating systems were prepared by dispersion process and applied to fiber cement and glass substrates. UV stability of the given systems were studied using accelerated weathering tester. The color change was determined using a spectrophotometer and the pull-off strength was studied using a pull-off tester. Furthermore, the relative surface hardness, gloss and adhesion of these façade coating systems were studied. The first results of the tests performed show that partially plant-based latex façade systems achieve similar or better efficiency compared to the commonly used acrylic binder intended for the preparation of these systems.

Key words

Latex, bio-based monomer, coating, façade system.

Acknowledgments

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OPTIMIZATION OF PIGMENTED ELECTRICAL INSULATING VARNISH FORMULATIONS FOR ENHANCED COVERAGE IN TRANSFORMER APPLICATIONS

OPTIMALIZÁCIA ZLOŽENIA PIGMENTOVANÝCH ELEKTROIZOLAČNÝCH LAKOV NA ZLEPŠENIE KRYCEJ SCHOPNOSTI V TRANSFORMÁTOROVÝCH APLIKÁCIÁCH

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Summary

The paper deals with the problem of imperfections in the final appearance of an impregnated transformer coated with a pigmented electro-insulating varnish based on an unsaturated polyesterimide dissolved in acrylate. The aim was to develop a colored impregnating agent with anti-corrosion properties, which would form a 50–100 micrometer thick layer on the transformer surface after curing. At the beginning of testing, a sample of impregnating agent with a standard composition was used, containing nano-filler, initiators and curing accelerators, a stabilizer, an anti-corrosion agent and pigment pastes. After the impregnation of the transformer and subsequent curing, the surface condition of the cured impregnant was evaluated, and the thickness of the resulting layer was determined. The impregnating agent with this composition met the requirement for layer thickness, but its appearance was unsatisfactory, with cracks, drips, and “tracks” being present. While maintaining the optimal processing properties of the impregnant, modifications in the formulation were made by adding rheological additives and additives to improve the dispersion of the nano-filler. Although the surface of the impregnated transformer was not completely ideal in this case either, a significant improvement in coating quality is evident, with only fine wrinkles or small bubbles present. Work on this topic will continue with further changes in the composition of the impregnant’s initiation system.

Key words

Polyesterimide resin, pigment, transformer, additive, surface agent, rheology, nanofiller.

Acknowledgements

This paper is supported by The Slovak Research and Development Agency, project „APVV-21-0078 Research of the sustainable resins with high efficiency and using raw materials from renewable sources“.

COMPOSITE SURFACE TREATMENT USING INORGANIC BASE STRUCTURING

KOMPOZITNÍ POVRCHOVÁ ÚPRAVA VYUŽÍVAJÍCÍ STRUKTURACI ANORGANICKÉHO ZÁKLADU

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Summary

The scope of the work was to produce and test inorganic-based surface-modified coatings with polymer impregnation, which aim to combine good heat and corrosion resistance with improved sliding and mechanical properties. Laser ablation of ceramic thermal spray coatings and impregnation by polyimide and polytetrafluorethylene based materials were carried out and tested.

Key words

Composite materials, coatings, thermal spraying, fluoropolymers, sealing, impregnation, sliding properties, corrosion resistance.

[Paper full text](#)



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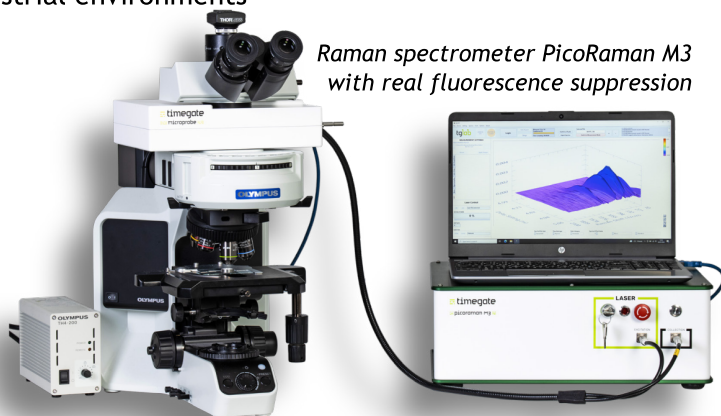
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INNOVATIVE METHODS FOR OPEN TIME DETERMINATION IN WATER-BASED PAINTS: A NOVEL APPROACH TO SURFACTANT UTILIZATION

INOVATIVNÍ METODY PRO STANOVENÍ DOBY SCHNUTÍ VE VODOU ŘEDITELNÝCH BARVÁCH: NOVÝ PŘÍSTUP K VYUŽITÍ POVRCHOVÉ AKTIVNÍCH LÁTEK

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Summary

This presentation introduces methodologies for quantifying and extending open time in water-based acrylic and polyurethane coatings, addressing challenges arising from VOC/SVOC reduction requirements. Our research employs a multi-faceted analytical approach that represents a significant advancement in open time measurement technology. The cornerstone of our innovation is a self-developed 12-pin geometry system that precisely measures paint torque and viscosity changes over time, providing unprecedented insight into drying dynamics. This is complemented by Rheolaser measurements that monitor Brownian motion to track surface dynamics changes during the critical drying phase.

Using advanced analytical methods, we have validated the efficacy of various surfactant chemistries (anionic and nonionic) and have developed a portfolio of high-performance open time extenders. Our findings categorize these additives by ionicity and compatibility with different paint systems, providing formulators with precise solutions for specific applications. . Products such as Dispersogen™, Emulsogen™, and Genapol™ series demonstrate remarkable performance in extending workability windows while simultaneously enhancing other coating properties including gloss, leveling, and sagging resistance. This innovative repurposing of surfactant technology offers new toolset for optimizing water-based paints and represents a significant advancement in water-based paint technology, addressing both environmental compliance and application quality requirements.

CLARIANT'S DIGITAL FORMULATION FACTORY – YOUR PARTNER IN COATINGS DEVELOPMENT

DIGITÁLNÍ TOVÁRNA NA FORMULACE OD CLARIANTU – VÁŠ PARTNER VE VÝVOJI NÁTĚRŮ

CECCON J.

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Summary

In an era where paint and coatings manufacturers face increasingly complex challenges, shortened product lifecycles, and resource constraints, Clariant introduces its innovative Digital Formulation Factory (DFF) concept. This presentation explores how the DFF is set to transform the coatings industry by providing a cutting-edge solution to formulation challenges.

The Digital Formulation Factory addresses key pain points in the coatings sector, including resource-intensive development processes, long testing timelines, and the need for rapid responses to market demands. By leveraging advanced technologies and Clariant's extensive expertise, the DFF offers a unique approach to formulation development and optimization.

We will discuss how the DFF:

- Expands laboratory capacity, allowing customers to solve complex formulation problems more efficiently.
- Accelerates testing processes, significantly reducing time-to-market for new products.
 - Provides comprehensive reports with actionable insights within weeks.
- Offers a high throughput of samples and test series, enhancing the scope of formulation possibilities.
- Evaluates options for further improvements, including additional testing and verification trials.

The presentation will highlight how the DFF is particularly beneficial for waterborne paint producers, mid-sized companies, and those interested in wetting agent screening and benchmarking. Additionally, we will showcase how the DFF supports customers in addressing regulatory pressures, improving carbon footprints, and indicating cost reduction possibilities in formulations. Finally, we will focus on a use case illustrating its capabilities and benefits in terms of formulation improvement and resource optimization.

Join us to discover how Clariant's Digital Formulation Factory is poised to become an indispensable tool for coatings manufacturers, offering a competitive edge in product development, problemsolving, and meeting the evolving demands of the market.

CHANGES IN LEGISLATION REGARDING CONFORMITY ASSESSMENT

ZMĚNY LEGISLATIVY V POSUZOVÁNÍ SHODY

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Summary

Products used for surface treatments are classified as regulated construction products, which are subject to mandatory conformity assessment. The main goal of the presentation is to inform manufacturers, importers, and distributors about the ongoing legislative changes – both within the national system (Government Regulation No. 119/2024 Coll., effective from January 1, 2025, amending Government Regulation No. 163/2002 Coll.) and in the harmonized area (Regulation (EU) 2024/3110 of the European Parliament and of the Council, which will enter into force on January 8, 2026, repealing Regulation (EU) No. 305/2011 of the European Parliament and of the Council).

The presentation provides a basic overview of the changes and, through practical examples, describes the procedures and obligations of manufacturers, or where applicable, importers or distributors, as well as those of the third-party independent bodies involved in the conformity assessment process.

Key words

Conformity Assessment; Changes in Legislation; CPR; Government Regulation No. 163/2002 Coll.; Government Regulation No. 119/2024 Coll.

EXPERIENCE IN TESTING COATING THICKNESSES BY CONE DRILLING ACCORDING TO ISO 2808 METHOD 6B

ZKUŠENOSTI SE ZKOUŠENÍM TLOUŠTĚK POVLAKŮ KUŽELOVÝM VRTEM PODLE ISO 2808 METODA 6B

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Summary

Testing of coating thicknesses by taper drilling is based on ISO 2808, Method 6B Taper indentation. The exact description is given in Section 5.4.5 Method 6B - Wedge indentation of the cited standard, which is valid in the Czech Republic as EN ISO 2808.

In this paper I present my own practical experience with the use of this test method.

Key words

Wedge indentation method, cutting tool - milling cutter, measuring microscope, coating, substrate, cut or bore, determination procedure.

[Paper full text](#)



A SMALL NOTE ON MEASURING COATING THICKNESS

DROBNÁ POZNÁMKA K MĚŘENÍ TLOUŠTKY POVLAKU

SLIŽ J.

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Summary

Coating thickness is a fundamental parameter, both technically and economically. The correct method of determination is a prerequisite and condition for the correct result. Influence of the standard used, adjustment.

Key words

Thickness, method of determination, standard, adjustment.

[Paper full text](#)



USE OF α -SILANE BINDER FOR THE PRODUCTION OF SOLVENT-FREE FLOOR COATINGS

POUŽITÍ α -SILANOVÉHO POJIVA PRO VÝROBU BEZROUZPOŠTĚDLOVÝCH PODLAHOVÝCH NÁTĚROVÝCH HMOT

MAREK J.

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Summary

The floor coating industry uses a variety of binders, whether they are one-component or two-component systems. Performance is required from floor coatings. Coatings must be durable, attractive and have good adhesion. In this project, we focused on testing a one-component -silane for application in floor coatings, which are dominated by their hydrophobicity, excellent vapor permeability and high gloss. This is a high solid system, for thin-layer application. Common properties in various formulations were tested, such as taber abrasion, pull-off test, gloss, hardness and other parameters. In this project, we also focused on the use of matting agents in this system.

Key words

One component floor-coatings, -silane, high solid system, coatings for mineral substrate.



CONFIGURATOR OF SUITABLE PPE (PERSONAL PROTECTIVE EQUIPMENT) BASED ON AN EMPLOYEE'S WORK RISK ASSESSMENT

KONFIGURÁTOR OOPP - APLIKACE PRO VÝBĚR OCHRANNÝCH PRACOVNÍCH PROSTŘEDKŮ PRO VAŠE ZAMĚSTNANCE

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Summary

Personal protective equipment (PPE) is an important and in many cases indispensable part of ensuring safety and health protection at work. It includes a large number of devices and tools that protect various parts of the human body „from head to toe“. Using appropriate protective equipment prevents risks from occupational accidents and occupational diseases. The PPE configurator is the main output of the project of the Association of the Chemical Industry of the Czech Republic implemented in 2023 and 2024 - „Configurator of suitable PPE based on the assessment of employee work risks“. This is an automatic, freely available application that will offer users a selection of suitable PPE with regard to the selected work risk factor, the negative impact of which on a specific selected part of the body needs to be prevented. Both a web application and an application for tablets/smartphones have been created, which allows you to use the configurator directly on site/in the field, i.e. where its use is most relevant/effective.

COMMON INSTALLATION ERRORS OF AIR-OPERATED DIAPHRAGM PUMPS

CHYBY PŘI INSTALACI VZDUCHOMEMBRÁNOVÝCH ČERPADEL

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Summary

Air-operated diaphragm pumps are among the most versatile types of positive displacement pumps. Their simple design, self-priming capability, and resistance to abrasive and viscous media make them suitable for a wide range of industrial applications – from chemical and food industries to wastewater treatment and filter presses. However, proper installation is crucial for ensuring long service life, operational reliability, and efficiency. In practice, several recurring installation errors are frequently observed, often leading to reduced performance or even pump failure.

The most common issues include improper sizing of suction or discharge piping, which increases pressure losses and promotes cavitation. Another critical factor is insufficient air supply – undersized hoses or missing air filter-regulator units restrict flow and cause irregular pump operation. Although these pumps can handle liquids containing solid particles, installing fine suction filters often results in clogging and vacuum damage to the diaphragms. Additional mistakes include missing shut-off valves, pressure gauges, or flow meters, which prevent proper adjustment to the desired operating point, and mechanical stress on pump flanges due to unsupported piping.

From a design standpoint, check valves on the suction side must never be used, as their delayed closing interferes with the internal check valves of the pump, significantly reducing its output. For pumps equipped with PTFE diaphragms, inlet pressure must not exceed 0.3 bar – otherwise, after stopping the pump, membrane rupture may occur. A similar risk exists with pressure buildup in closed piping systems, particularly when pumping low-boiling liquids, where temperature variations can cause medium expansion and overpressure.

For reliable and efficient operation, it is essential to follow the manufacturer's recommendations, use correctly dimensioned piping, install flexible connections to damp pulsations, and ensure proper air treatment.

Katko s.r.o. provides technical support in pump selection, piping design, and installation supervision to ensure optimal service life and cost-effective operation.



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COMPOSITE MATERIALS FROM UNSATURATED POLYESTER RESINS AND QUARTZ POWDER

KOMPOZITNÍ MATERIÁLY Z NENASYCENÉ POLYESTEROVÉ PRYSKYŘICE A KŘEMENNÉHO PRACHU

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*2 Department of Polymer Chemistry, Institute of Chemical Sciences, Faculty of Chemistry,
Maria Curie-Skłodowska University, Lublin, Poland*

Summary

This study focuses on chemical recycling of polyethylene terephthalate glycol (PETG). It is popular material for growing 3D printing industry where it is used as filament in fused deposition modeling (FDM) printers. This growing trend means more polymeric waste. In this study the waste PETG was chemically recycled via glycolysis. Furthermore, the unsaturated polyester resin was prepared from this glycolysate.

This resin was then mixed with quartz powder to create composite material with enhanced mechanical properties. Mechanical testing was performed on universal testing machine. The addition of quartz powder caused the Young's modulus to increase. Hardness tests showed higher values in composites with higher amount of quartz powder. This material was also able to retain glossy surface. Fracture surfaces were examined by scanning electron microscopy (SEM).

Key words

Unsaturated polyester resin, PETG, quartz powder, composite material.

Acknowledgments

We are grateful to Ministry of Education, Youth and Sports of the Czech Republic for support through project No. SG352005.

APPLICATION OF SEMICONDUCTOR PHOTOCATALYSIS FOR SURFACE DEZINFECTION AND AIR PURIFICATION

VYUŽITÍ POLOVODIČOVÉ FOTOKATALÝZY PRO DEZINFEKCI POVRCHŮ A ČIŠTĚNÍ VZDUCHU

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Summary

Semiconductor photocatalysis represents a promising method to decompose organic pollutants dispersed in air or in aqueous phase (e.g. VOC, traces of herbicides, drugs, hormones etc). The other main application is based on so called self - cleaning ability - the combination of photogeneration of reactive species with oxidation potential and superhydrophilic properties. Superhydrophilic means that water doesn't form droplets on a surface coated with nanoparticulate TiO_2 which is irradiated by UVA light. What happens is that the contact angle decreases and created a water film on the surface. Such surface (typically building facade) is not to susceptible to soiling and thus this phenomenon help to keep the surface of buildings clean.

This contribution introduces the basic principles of photocatalysis and showcases applications in the two major domains of its commercial utilization - self-cleaning ability and air purification.

Key words

TiO_2 , photocataytic activity, self - cleaning, paints, air purifiers.

[Paper full text](#)



USE OF MONOMERS BASED ON ACRYLATED DERIVATIVES OF VEGETABLE OILS IN EMULSION POLYMERIZATION

VYUŽITÍ MONOMERŮ NA BÁZI AKRYLOVANÝCH DERIVÁTŮ ROSTLINNÝCH OLEJŮ V EMULZNÍ POLYMERACI

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2 Synpo, a.s., Pardubice

Summary

The need for the production of synthetic polymers from renewable and sustainable resources also affects the area of emulsion polymerization. Acrylated methyl esters of higher fatty acids derived from rapeseed, camelina, and linseed oil were synthesized through transesterification, epoxidation, and subsequent acrylation. Methyl methacrylate and butyl acrylate were copolymerized with various amounts of bio-based monomers (5–30 wt.% in monomer mixture) to obtain polymeric latexes for coating applications.

Successful emulsion polymerizations with up to 20 wt.% of bio-based monomers were performed with low coagulum and high monomer conversion. The incorporation of bio-based monomers into polymeric latexes was confirmed with infrared spectroscopy. Asymmetric flow field-flow fractionation coupled with multi-angle light scattering was used to analyze the synthesized copolymers in terms of their molar mass distribution. The results revealed that copolymerizing the bio-based monomers resulted in ultra-high molar mass nanogel fractions formed due to multi-acrylated ingredients derived from polyunsaturated fatty acids.

The phenomenon of nanogel formation became more pronounced for the linseed oil-based monomer. Evaluated coating properties showed that latexes comprising the bio-based monomers provided increased water repellence (about 10° higher water contact angles were achieved for all bio-based coating compositions in contrast to a reference latex). Moreover, latexes comprising chemically modified oils in the content of 25 and 30 wt.% provided water whitening-resistant coatings, making the bio-based monomers promising candidates for replacing petroleum-based monomers in the production of sustainable latex coatings.

Key words

Rapeseed oil, linseed oil, camelina oil, emulsion polymerization, latex, bio-based monomer, molar mass, water whitening.

Acknowledgments

The work was supported by ERDF “Innovative materials suitable for high added value applications (INMA)” (No. CZ.02.01.01/00/23_021/0008593).

SYNTHESIS OF UNSATURATED POLYESTER RESINS FROM BIO-BASED MONOMERS

SYNTÉZA NENASYCENÝCH POLYESTEROVÝCH PRYSKYŘIC Z MONOMERŮ NA BIOLOGICKÉ BÁZI

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Summary

Unsaturated polyester (UP) resins are solutions of unsaturated polyesters in reactive diluent, which after crosslinking form dense polymer network. Commercial UP resins are produced from oil-based chemicals but there is an increasing trend toward bio-based alternatives. One notable bio-based feedstock is itaconic acid, a dicarboxylic acid with a reactive double bond, reported in the literature as a sustainable replacement for maleic anhydride for the production of UP resins. In this study, we examined styrene-free UP resins accessible from itaconic anhydride, a bio-based compound produced by dehydration of itaconic acid or pyrolysis of citric acid. Another bio-based monomer used to prepare UP resins in this work is thiophene 2,5 dicarboxylic acid, which is produced from adipic acid. Prepared UPs were characterized by SEC and NMR, IR and Raman spectroscopy. Mechanical and thermal properties of cured formulations were studied. It was found that Young's modulus of bio-based UP resins reaches 3.5 GPa, which is comparable to commercial oil based UP resins.

Key words

Unsaturated polyester resins, bio-based monomers, itaconic acid, thiophene 2,5 dicarboxylic acid.

Acknowledgments

The authors acknowledge the financial support from The Ministry of Education, Youth and Sports of the Czech Republic (SG352005).

THE EFFECT OF POLYSACCHARIDE COLLOIDAL DISPERSION ON PAINT RHEOLOGY

VLIV POLYSACHARIDOVÉ DISPERSE NA REOLOGII NÁTĚRŮ

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Summary

Selected polysaccharide colloidal dispersion can be used as a versatile and effective additive to provide a number of benefits to formulations.

It has been shown to have a positive effect on important coating parameters, including drying speed, film hardness development and the optical and mechanical properties of films. It also significantly affects the rheology of coatings.

This presentation will focus on using polysaccharide colloidal dispersion as a rheological additive in various types of water-based system, including polyurethane, epoxy, and acrylic systems.

Key words

Thickener, Rheology, Eco-friendly, Sustainable products.

[Paper full text](#)





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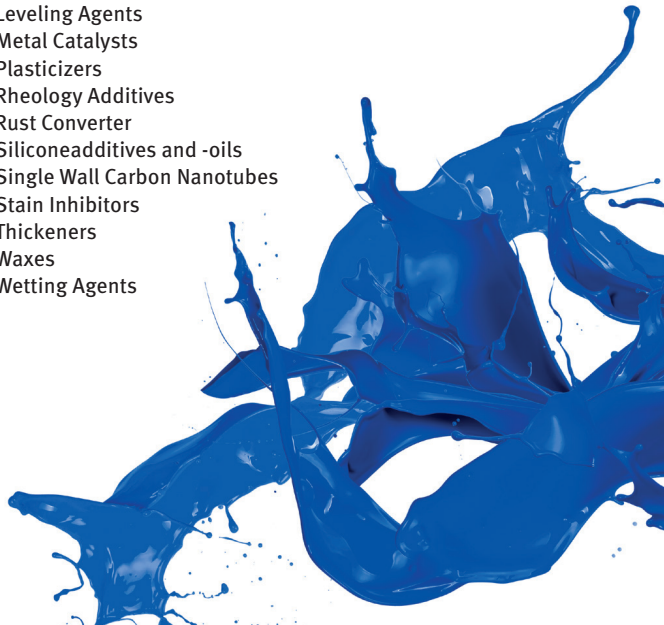
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EXPLANATION OF THE CAUSES OF LOSS OF ADHESION OF THE COATING SYSTEM OF RAILWAY TANKERS FOR AVIATION KEROSENE

OBJASNĚNÍ PŘÍČIN ZTRÁTY ADHEZE NÁTĚROVÉHO SYSTÉMU ŽELEZNIČNÍ CISTERNY NA LETECKÝ PETROLEJ

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Summary

The loss of adhesion of the coating system of an aircraft fuel tank is a serious problem that can lead to the failure of the tank and, consequently, to a serious accident. The causes of this failure are complex and involve a number of factors, including the quality of the coating system, the quality of the tank, the quality of surface preparation etc.

Key words

Epoxy coating, specific corrosive environment, surface preparation, salt contamination.

[Paper full text](#)



TREATMENT AND RECYCLING OF WASTEWATER FROM A GALVANIZING PLANT FOR SURFACE TREATMENT AUTOMOTIVE COMPONENTS

ČIŠTĚNÍ A RECYKLACE ODPADNÍCH VOD Z GALVANIZOVNY PRO POVRCHOVOU ÚPRAVU AUTOMOBILOVÝCH SOUČÁSTEK

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Summary

The work summarizes the experimental results of the separation of zinc and nickel ions from real process and waste waters of the galvanic operation. It can be stated that alkaline precipitation with hydroxides is no longer a sufficient separation process for reliable compliance with emission limits for zinc and nickel, mainly due to the high salinity of the water and the amphoteric behavior of zinc. Sulfide precipitation is very effective, but it poses a safety risk due to the possible release of toxic sulfane. Organic precipitants based on dialkyldithiocarbamates (DDTC) appear to be effective, which are effective but require strict pH control. In addition, they pose a risk of toxic by-products. The optimal solution appears to be two-phase precipitation, where primary alkaline precipitation is followed by final purification using the trisodium salt of trimercapto-s-triazine (TMT), which is highly effective, does not require additional pH adjustment, and reliably ensures that the required limits of 0,15 mg/l Ni^{+2} and 1,5 mg/l Zn^{+2} are achieved. The costs of secondary precipitation ranged from 0,08–1,0 Euro/m³ and depended on the initial concentration of Ni^{+2} (0,2–5 mg/l) and Zn^{+2} (2,0–20 mg/l).

Key words

Zinc and nickel precipitation process, alkaline, sulfide and complex dithiocarbamate precipitation, trisodium trimercapto-s-triazine and its insoluble metal complexes.

[Paper full text](#)



SYNTHESIS OF ZNO FLOWER-LIKE STRUCTURE INTO WOOD SUBSTRATE TO ENHANCE THERMAL STABILITY

SYNTÉZA KVĚTOVITÉ STRUKTURY ZNO DO DŘEVĚNÉHO SUBSTRÁTU PRO ZVÝŠENÍ TEPELNÉ STABILITY

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Summary

The development of self-coated bio-based composites with improved thermal resistance is an important step toward sustainable materials for construction and energy applications. In this study, flower-like zinc oxide (ZnO) micro/nanostructures were synthesised and deposited onto wood substrates to improve their thermal stability. The morphology and chemical features of the ZnO-coated wood were examined using scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDS), and Fourier transform infrared spectroscopy (FTIR). The findings show that ZnO-treated wood exhibits greater resistance to thermal degradation, underscoring the role of hierarchical micro/nanostructures in enhancing material performance.

Key words

ZnO; flower-like micro/nanostructures; wood substrate; thermal stability.

[Paper full text](#)



EFFECT OF SURFACE PREPARATION ON THE STRENGTH PROPERTIES OF THE JOINT BETWEEN CAST EPOXY RESIN AND SOLID WOOD

VLIV PŘÍPRAVY POVRCHU NA PEVNOSTNÍ VLASTNOSTI SPOJE MEZI LITOU EPOXIDOVOU PRYSKYŘICÍ A MASIVNÍM DŘEVEM

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Summary

This paper deals with the influence of surface preparation on the strength properties of joints between solid wood and cast epoxy resin with the aim of increasing the aesthetic and functional value of the final product. Traditional surface preparation methods, such as sanding and brushing, are compared with modern technologies including plasma treatment and dry ice blasting. The experimental part focuses on the evaluation of tensile strength and impact toughness. FTIR analysis was also performed for more detailed verification of the results.

Key words

surface preparation, tensile strength, impact toughness, solid wood and epoxy resin bonding, FTIR analysis, meranti, dry snow, plasma treatment.

[Paper full text](#)



UNIVERSITIES AND INDUSTRY IN JOINT EDUCATION OF PH.D. STUDENTS

VYSOKÉ ŠKOLY A PRŮMYSL VE SPOLEČNÉM VZDĚLÁVÁNÍ PH.D. STUDENTŮ

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Summary

The lecture deals with the issue of universities and industry in the joint education of Ph.D. students, where this possibility arises with the adoption of the amendment to the Higher Education Act. The lecture shows the conditions of this cooperation, the opportunities it brings for universities and industry, as well as critical points and opposing views on this joint education from both schools and industry.



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Hlavními obchodními partnery a dodavateli surovin jsou přední evropští výrobci z Německa, Francie, Španělska, Belgie, Rakouska, Itálie, Chorvatska, Maďarska a dalších evropských zemí.

Naše nabídka surovin se zaměřuje především na výrobce nátěrových hmot a lepidel, výrobce stavební chemie a plastikářský průmysl.

Struktura sortimentu nabízených surovin:

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Plniva – vápence, talky, baryty, slídy, břidlice, mica

Additiva – dispergační prostředky, odpěňovače, rozlivová činidla, inhibitory koroze, akrylátové zahušťky

Sušidla – do rozpouštědlových a vodouředitelných systémů

Matovací a zahušťovací prostředky prostředky na bázi oxidu křemičitého

Saze – do rozpouštědlových a vodouředitelných systémů

Vzorkovnice – RAL

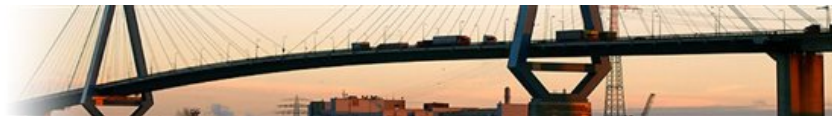
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Kovové obaly – lakovky, kovové láhve, kanystry, vědra, hoboky a sudy

Plastové obaly – kanystry, soudky, dózy

Skleněné obaly – láhve, lahve pro potravinářský průmysl

WWW.3P-CHEM.CZ



BIESTERFELD SILCOM s.r.o.

Společnost byla založena v roce 1992 jako Silcom s.r.o. V roce 2002 se připojila k mezinárodní společnosti Biesterfeld Spezial Chemie GmbH (součást koncernu Biesterfeld SE) a byla přejmenována na Biesterfeld Silcom s.r.o. Připojením k nadnárodní skupině se výrazně rozšířilo portfolio dodavatelů a tím i sortiment produktů dodávaných na český a slovenský trh prostřednictvím společnosti Biesterfeld Silcom. Na Slovensku působí dceřiná firma, Biesterfeld Silcom Slovakia s.r.o.

Společnost se od svého založení zabývá dovozem chemických surovin a speciálních chemikálií. Kromě vlastních dodávek chemikálií zajišťujeme také technické poradenství. Disponujeme sklady v Čechách i na Slovensku a díky tomu jsme schopni zajistit optimální logistický servis.

Na českém a slovenském trhu zastupujeme více než 60 významných světových výrobců a dodáváme suroviny do řady průmyslových odvětví (výroba polymerů, stavebních a nátěrových hmot, chemikálie pro textilní, kožedělný a papírenský průmysl, výroba kosmetických, čistících, dentálních a farmaceutických přípravků, pro gumárenství, výrobu polyuretanových pěn a pro řadu dalších aplikací). Dodáváme také hotové chemické přípravky – produkty určené pro přímé užití v široké škále odvětví (elektronika a elektrotechnika, energetika, strojírenství, nástrojářství a prototypová výroba, automobilní průmysl a výroba ostatních dopravních prostředků vč. letadel, výroba kompozitů, stavebnictví).

Kompletní informace o portfoliu naší společnosti naleznete na webových stránkách

<https://www.bisi.cz>

Cyklické korozní komory SSP, CCT, CRH



**Pracovní objemy
640 a 1100 litrů**

Modely Q-FOG SSP a CCT

- Komory pro zkoušky v solné mlze
 - NSS, AASS, CASS
- Kondenzační zkoušky
- Kombinované a cyklické zkoušky

Zkušební normy:

- ISO 9227, ASTM B 117, ASTM G85
- VDA 621-415, ISO 6270-2, Prohesion testy

Modely Q-FOG CRH-HTCR

- Zkoušky v solné mlze
- Kondenzační zkoušky
- Kombinované a cyklické zkoušky
- Regulace relativní vlhkosti
- Velmi rychlé teplotní změny
- Přímý postřik vzorků solným roztokem výkonnými samočisticími tryskami
- Klimatizační jednotka pro chlazení a sušení komory



Zkušební normy:

- Volvo VCS 1027, 149
- GMW 14872, SAE J2334
- Normy Ford, Volvo, Scania, Renault, VW, Chrysler, ISO, GB/T, JASO M 609

Programování a řízení všech modelů pomocí dvou barevných dotykových 7" displejů, menu v českém jazyce.

Záznam a zpracování naměřených dat z proběhlých testů.

Zajišťujeme prodej, servis, instalace, zaškolení, poradenství, kalibrace ISO 17 025

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info@labimex.cz
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PROVEDITELNOST**

**Pilotní
sonikátory
TESTY**

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sonikátory
PROVOZ**

- čištění profilů on-line
- dezintegrace
- dispergace
- extrakce / extrakce bylin

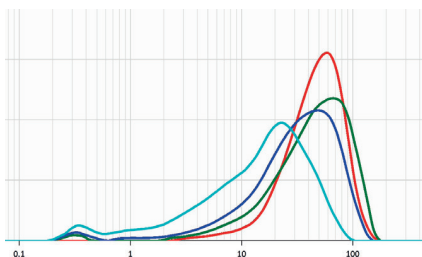
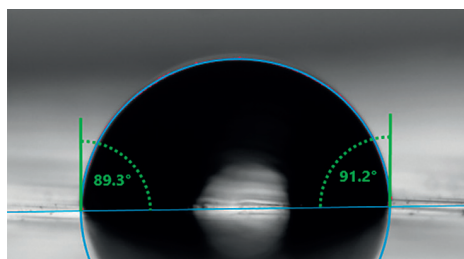
- emulzifikace
- homogenizace
- sonochemie
- redukce velikosti částic



Uni-Export Instruments, s.r.o.

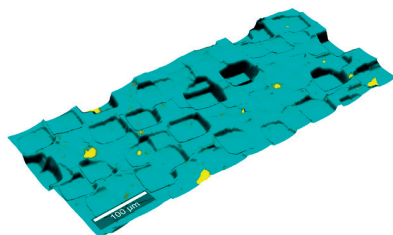
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Nová generace Ramanových spektrometrů
pro analýzu nejen pigmentů a pojiv



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typy vzorků.

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snadno a efektivně.
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- ❖ Podpora identifikace
a kvantifikace
- ❖ Soulad s regulacemi
(např. 21 CFR Part 11)
- ❖ Kompaktní design
a snadná integrace





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- Epoxidové pryskyřice
- Tvrdidla pro epoxidové pryskyřice
- Vodou ředitelné alkydové emulze
- Melamin-formaldehydové pryskyřice
- Fenolické pryskyřice
- CAB (acetobutyrát celulózy)

PIGMENTY

- Hliníkové pigmenty a pasty
- Zinkfosfáty
- Lamelární zinek
- Granulované a mikronizované NC chipsy
- Perleťové pigmenty

ADITIVA

- Dispergační aditiva a smáčedla
- Tixotropní aditiva
- Odpěňovače
- Koalescenty a neutralizační činidla
- Vosky a voskové emulze
- Organické inhibitory koroze
- Promotéry adheze (na kovy a plasty)
- Vodivá uhlíková vlákna



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průmyslová zařízení

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míchání a dispergace kapalin

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- Výkon do 2,2 kW
- Pohodlné ovládání pomocí dotykové obrazovky
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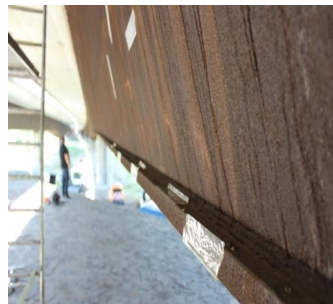
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Allnex 	Akrylátové pryskyfice Alkydy Aminové pryskyfice Hydrofobní polyoly Pryskyfice modifikující rheologii Nenasycené polyesterové pryskyfice Vodou feditelné polyoly a akrylátové disperze Aditiva pro dispergaci, rozliv, odpěnění, sušidla Epoxydové pryskyfice a tvrdidla Epoxy estery Vodou feditelné polyurethanové disperze a další	SETALUX, MACRYNAL SETAL, RESYDROL SETAMINE SETATHANE SETAL, SETALUX, SETAQUA ROSKYDAL SETAQUA, UCECRYL ADDITOL, MODAFLOW BECKPOX, BECKOCURE DUROXYN DAOTAN
Wanhua/Borsodchem (drive Vencorex) 	Samoemulsifikované polysokyanáty Alifatické isokyanáty (biuretové, trimery, nízkoviskozní) reaktivní rozpouštědla	EASAOUA TOLONATE TOLONATE X FLO 100
Huntsman 	Epoxydové pryskyfice (na bázi bis A, F, A/F) kapalně, pevné, v roztoku Epoxy fenol novolaky Epoxydová reaktivní rozpouštědla Tvrdidla pro epoxydové pryskyfice Tvrdidla pro epoxydové pryskyfice pro nízké teploty	ARALDITE ARALDITE EPN ARALDITE DY ARADUR ARACOL
West&Senior LTD 	Tónovací pigmentové pasty (epoxy, polyurethan, polyester, PVC) Monopigmentové preparace; RAL odstíny	FASTINT
Vliegenthart 	Oleje Rostlinné (ricinové, lněné, řepkové, sojové, tungové apod.) Hotové výrobky k přebalení (odstraňovače barev, PUR čističe apod.)	
Organometal 	Sikativní/Sušidla Zn, Ca, Co, Zn, Sr, Mn, Sušidlové směsi Dispergátory Odpěňovače (na bázi minerálních olejů)	ORGANO ORGANO MIX DISPORGAN ANTIFOAM
Lehmann&Voss 	Organická rheologická činidla pro rozpouštědlové a bezrozpouštědlové systémy (deriváty ricinového oleje, polyamidy a jejich směsi, polyolefiny) Anorganická rheologická činidla pro rozpouštědlové a vodné systémy Pasti (aditiva pro práškové barvy) Lehčená plniva (silikáty, aluminium silikáty apod.)	LUVOTIX LUVOGEL LUVOTIX OMEGA-SPHERES, TRI-SPHERES, OMEGA-SIL
Roquette 	Deriváty škrobu pro průmyslová lepidla Deriváty škrobu pro stavební chemii Kyselina glukonová a její deriváty	TACKIDEX POLYSORB
FP Pigments 	pigment částečně nahrazující titanovou bělobu	
Shandong Jinhai Titanium Resources Technology Co., Ltd. 	titanová běloba (sulfátový proces) titanová běloba (chloridový proces)	
Shamrock 	Mikronizované prášky, vosky (PE, PTFE) Čisté, směsi, v oleji, ve vodě Textury, matovačidla	SST, FluoroSLIP FluoroSPERSE, AquaFLON, HydroCER Cera SPERSE, EverGLIDE, Texture, TexMATTE
S+A Blackwell 	Antikorozní pigment (zinkfosfát)	DELAPHOS
a mnoho dalších ...		

Ústav strojírenské technologie Fakulta strojní ČVUT v Praze a Centrum pro povrchové úpravy v rámci celoživotního vzdělávání v oboru povrchových úprav připravují dvousemestrální studium

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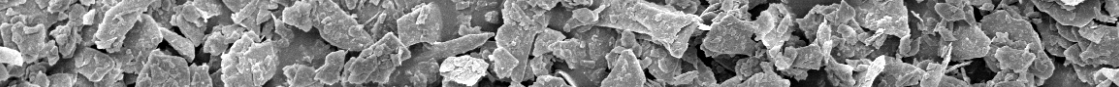
Studium schválené Certifikačním sdružením pro personál z.s. - APC.

Termín zahájení studia Korozní inženýr – 10. února 2026

Do studia je možné se již přihlásit

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