Launch of the website dedicated to alternatives to hexavalent chromium-based treatments for metal coatings and conversion layers

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Result of the interreg project Alt Ctrl Trans.

PROMOSURF, the French-speaking part of the Belgian association for surface treatment of materials (VOM) developed in 2015 a website dedicated to alternatives to chromating. In 2022, the site was completed with alternatives for hard chromium applications. Thanks to the collaboration with Sirris, CRITT and Materia Nova.

Who is not looking for an alternative to hard chromium or chromating, treatments based on CrVI and used in all industrial fields for the protection against wear or corrosion of metals (bare steel, galvanized steel, aluminum, etc.)? For years, these treatments have proven their effectiveness. However, CrVI has proven to be toxic and carcinogenic, raising many concerns in scientific and political circles. With the REACH regulation, its use is subject to authorization.

By alternative to CrVI, we mean any technical solution that provides the same final functionality as that obtained by CrVI-based treatments. This solution can be a "product" alternative, a "process" alternative or a totally different "surface treatment" system.

The results of the work have been listed on the website http://alternative-cr6.vom.be. The website includes various general tabs that allow access to the content through different "entrances": chemistry, field of application, implementation or metal substrate to be protected.

This online tool, accessible free of charge via the VOM website, www.vom.be, has been designed to offer the maximum amount of useful information to manufacturers faced with the choice of one or more alternatives to replace processes using hexavalent chromium. It is neither a complete bibliographical study nor a scientific analysis but reflects the exchange of information that took place between the participants of the working group and the partners Sirris, Critt, Materia Nova and VOM in the ALT-CTRL-TRANS project.

The alternatives discussed were divided into 2 main groups:

1. Alternatives to chromating in conversion layers
2. Alternatives to hard chromium coatings

Regarding the first group, a number of alternative processes have been on the market for years with very good results. However, the situation is different for group 2. At present, there is no alternative that can match all the properties of hard chromium. Processes such as electroless nickel, PVD, heat treatment, thermal spraying and laser cladding can serve as alternatives for specific applications but not for all applications. In the Alt Ctrl Trans project, alternative coatings such as NiB, NiW, and Cr via PTA have been developed and have shown promising results, but these new alternatives are still too premature to be applied on an industrial scale.

For each alternative, there is a brief description of the properties, performance and industrial constraints associated with their implementation. This tool is not intended to be exhaustive, but the most common fields of application and metals to be protected are listed and described. It has also been designed to be as flexible as possible: documents, images and other data can be added in order to constitute a constantly evolving information tool. The content will be updated by the members of the working group but also thanks to the comments of the visitors.

We invite you to visit the site via the link http://alternative-cr6.vom.be.

Do not hesitate to send us any remark or information allowing us to complete it. You can send them to Julie Moreau.

Sirris

Authors