



Managing chrome VI

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Last year, European Regulation 301/2014 came into force restricting Chromium VI (hexavalent Chrome) in leather articles. This regulation amends entry 47 of Annex XVII of the REACH regulation (1907/2006) and contains the following clauses.

5. *Leather articles coming into contact with the skin shall not be placed on the market where they contain chromium VI in concentrations equal to or greater than 3mg/kg (0.0003% by weight) of the total dry weight of the leather.*
6. *Articles containing leather parts coming into contact with the skin shall not be placed on the market where any of those leather parts contains*

chromium VI in concentrations equal to or greater than 3mg/kg (0.0003% by weight) of the total dry weight of that leather part.

7. *Paragraphs 5 and 6 shall not apply to the placing on the market of second-hand articles which were in end-use in the Union before 1st May 2015.*

These requirements apply to all products within the scope placed on the market from 1st May 2015 and include footwear and clothing made from leather.

The regulation cites EN ISO 17075 as the reference test method and 3mg/kg as the determination limit of this method and forms the basis for monitoring and enforcing these

requirements. This limit is, however, higher than the European Chemicals Agency - Committee for Risk Assessment Lowest-Observed Adverse Effect level and therefore there is pressure for a more sensitive test method to be developed.

The regulation is aimed at reducing the occurrence of chrome VI related allergic dermatitis from leather goods and it is envisaged that the instance of such reactions will fall by 80% when the regulation is in place. This requirement has meant that many more retailers are checking the products they supply which fall within the scope of this regulation for the presence of chrome VI.

SATRA carries out many tests either

as part of demonstrating the innocuousness requirement for Personal Protective Equipment (PPE) such as leather gloves or footwear or when products are being tested against retailer or sourcing company specifications. In its overall experience, around 10% of leathers tested fail the chrome VI requirement. There is however, no clearly observable trend in identifying the types of leathers that are more likely to fail, as failures have been observed in gloves, motor cycle boots, footwear linings, footwear uppers and leather swatches.

In order to address concerns about the impact of this regulation on the tanning and leather goods industry as a whole, the Society of Leather Technologists and Chemists convened a Chromium VI panel as part of their 119th Conference held at the University of Northampton in April this year. SATRA was represented on the panel by John Hubbard, its technical manager, alongside industry experts on leather production, tanning chemicals and leather research. The panel addressed questions from the conference floor of the conference as well as answering those that had been submitted prior to the conference from across the supply chain.

The questions received covered topics ranging from the impact of leather use on the environment and the frequency of failures, through the external factors that can influence the formation of chrome VI to issues surrounding testing for its presence, end of life concerns about disposal of leather goods in landfill and incineration.

The experts on the panel acknowledged that chrome VI was a recognised problem in the industry and that there are still unanswered questions about its formation, conversion and detection which will be the focus of an ongoing research project. The panel was able to reassure delegates that by following best practice such as the nine rules published by the IULTCS (International Union of Leather Technologists and Chemists Societies) then it is possible to produce good quality leather that should not exhibit the formation of chrome VI during its functional lifetime.



SATRA has found that around 10% of leathers tested fail the chrome VI requirement.

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1. Always use premium chrome tanning salts.
2. No use of oxidation agents (i.e. bleaching) on leather after tanning.
3. Finish the wet end processing at low pH conditions (3.5 - 4).
4. Carry out a final washing.
5. Avoid the use of excess ammonia prior to the dyeing process.
6. Use high performance softening chemicals (no unsaturated lipids or waxes).
7. Avoid the use of chromate pigments (yellow and orange inorganic pigments).
8. Use between 1% and 3% vegetable tannin extract as this provides antioxidant protection.
9. Use synthetic antioxidants where it is not possible to apply vegetable agents.

A number of specifications are now being written that include a pre-ageing step before testing for chrome VI to ensure that products should remain free from it during their useable lifetime. However, as there are unanswered questions about the mechanisms that

can influence its development, a number of different ageing methods have been proposed.

The European standards committees for leather and footwear have been working together to develop a single ageing protocol that will meet the needs of both sectors. It should be stressed that the regulation does not imply that the chrome VI content of a product should be determined after the product has been aged. Many retailers and sourcing companies nevertheless consider that such ageing could describe foreseeable use under the General Product Safety concept and by testing in this manner they show due diligence.

This correlates with SATRA's experience that there has been a marked increase in testing for chrome VI, particularly outside PPE, where it has been mandatory for several years in order to demonstrate that products placed on the market in the European Union are in compliance with the requirements of the new regulation. Nevertheless, there are no reasons for complacency as many products listed on the product recall database RAPEX are associated with the presence of chrome VI in leather goods. 