

Making chromium VI detection easier

Deputy Editor **Tom Hogarth** speaks to Sébastien Bagot, Technical and Quality Manager at the Association pour l'Assurance Qualité des Fabricants de Bracelets Cuir (Association for Quality Assurance of Leather Bracelets Manufacturers or AQC) about the association's development of a quick test for chromium VI in leather watch straps.

The quick test is designed to be used by anyone.



Sébastien Bagot,
Technical and
Quality Manager
at the AQC.

The AQC, with its five founding and total members (Brasport, Camille Fournet, Hirsch Armبänder, Interstrap and Multicuir) is in a unique position for an association in that it is pulled in fewer directions and has a more focused drive to achieve its members goals. One of these main goals is dealing with chromium VI in leather. The AQC serves the leather watch strap manufacturing industry, with a focus on ensuring a responsible global supply chain. Together with its members, the association works with watch brands, tanneries, component suppliers, laboratories and alligator farms to achieve its goals.

While there is some amount of chrome-free tanning in the watch strap manufacturing industry, the AQC notes that most of its members deal with chrome-tanned leather either solely or primarily. In fact, while some have attempted to move away from chrome to eliminate the issue of

chromium VI entirely, this has resulted in problems in other areas such as weaker overall performance.

In 2021, the organisation brought to a close a five-year stability study for leather and leather bracelets, which aimed to propose an ideal storage method for watch bracelets and leather to prevent the development of chromium VI, chromium VI reverse as well as pH and formaldehyde stability. The result of the study was the satisfactory development of a storage solution to prevent and even correct levels of chromium VI above the currently accepted level of 3mg/kg. Now, the AQC has developed a quick test to detect chromium VI in leather and leather watch straps. Tested more than 2,000 times with its members, the quick test is available for public sale and at a discounted rate to its members and can detect chromium-VI in three hours.

While manufacturers regularly test leather for the presence of chromium VI above regulated levels, this requires sending samples off to a lab and waiting for the results. This new test will add another option to the toolkit to detect chromium VI sooner and reduce delays in manufacturing.



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Sébastien Bagot, Technical and Quality Manager at the AQC, explained that the association began developing the test in 2016 using the colorimetric method for detecting chromium VI. One of the major objectives in development was ensuring that the test, with some minor equipment, could be performed by anyone and not just a lab technician. With this in mind, the AQC also selected reagents and other chemicals as part of the test that wouldn't present a risk to the user, particularly if they weren't trained in handling these sorts of chemicals or tests. The people that are expected to actually use the test, at least in the example of the five AQC members, are the people performing the physical tests on leather. Brands are also able to use the tests and Bagot explained that they are now also able to conduct quick chromium VI testing on watch straps they have in storage as well.

Training and equipment

Conducting the test does require some training and equipment, but the AQC has kept this as minimal as possible. It requires a rotating device and a scale, as well as the one gram leather sample to be tested, and then a four-hour training session

provided by the AQC. After three hours of incubation and some basic steps, the rest will reveal whether or not the sample contains chromium VI above the 3mg/kg level with a simple colour match. The kit also includes a fake sample to mimic the colour of a test presenting 3mg/kg for comparison.

In 2022, the AQC also conducted a study with an independent institute for leather in Italy, Polo Tecnologico Conciario (POTECO), performing the test on 100 samples with 30 known to be positive for chromium VI as per the standard restrictions and the rest negative. POTECO conducted both the AQC quick test and their accredited ISO testing method on the samples. The results, Bagot explained, revealed that the AQC test has an accuracy of more than 94%, with just one of the 30 positive chromium VI samples providing a false result.

One problem for the AQC and the wider industry is the current move in legislation circles, notably in the European Union, to bring the limit of chromium VI down to 1mg/kg. The major problem here is that there is currently no standardised way to test for chromium VI with this accuracy.

Bagot said: “The regulator's role is to protect the consumer and the environment. So, when they decide the limit, it's for the health of the consumer and for the good of the environment. So sometimes they make some decisions about limits or methods that do not exist and they hope that we are going to issue some method to answer the limits.”

Now that it has completed its storage study and developed this quick test, the AQC will continue to place the management of chromium VI at the top of its agenda. Though there are no confirmed projects on the horizon, Bagot explained there are a few areas that could yield interesting projects or new products, such as with new tests to predict the development of chromium VI or avoiding it entirely.

For now, the test is complete. The AQC has no definitive plans to further develop the kit or improve on what is essentially exactly what it set out to create. Bagot noted that there could be a very minor improvement to reduce the minor amount of solvent present in the kit now, but that it presents no problems as it is. Of course, if the limits on chromium VI change in Europe then not only will the AQC have to race to adapt and meet this currently unobtainable testing accuracy, but no doubt the wider leather industry will find itself in a scramble to meet the requirements.

The test is available to non-members for SFr228 (€234.20), including materials to conduct six tests, while the four-hour test training is available for SFr1,232 (€1265.40). |