



Hexavalent Chrome (Chrome VI) – The issues...

You may be aware of pending legislation which will have an impact on our industry.

Due to increased legislation on certain chemicals we use, some have now been classed as ‘substances of concern’.

As a result, different sectors have reacted by either restricting their use, or banning their use completely.

One substance that has been used extensively within the zinc-plating sector has been hexavalent chrome.

A simplified description of the process for zinc plating involves a deposit of around 5 microns of zinc followed by a thin film layer called a passivate, which is usually either yellow or clear in appearance. These combined layers then give your component protection against corrosion.



**Zinc plated plus
clear passivate**



**Zinc plated plus
yellow passivate**

When your components are in use, these two layers act as barriers with both offering sacrificial protection until ultimately the component itself starts to corrode.

The following table shows how long each of these layers last until the component starts to rust.

Finish	Passivate breakdown	Zinc layer breaks down
Zinc plate & clear passivate	15-24 hrs	130-172 hrs
Zinc plate & yellow passivate	72-96 hrs	180-240 hrs

Why is this substance a problem?...

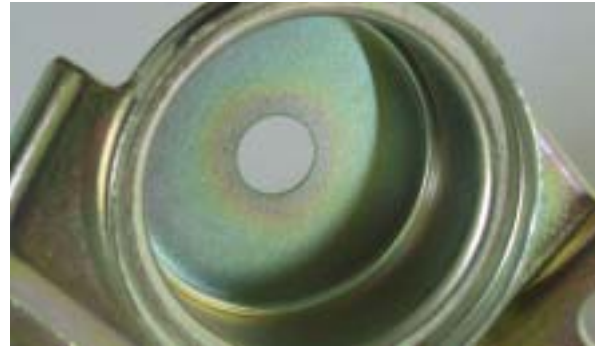
Hexavalent chrome is classified as a substance of concern for a number of reasons...

- It is a known carcinogenic product and can create other skin related problems. This is particularly pertinent if you, like us, have members of staff handling plated items. As the passivate is only a thin film, it will come off when handled, and therefore come directly into contact with the skin. Furthermore, and perhaps even a higher risk, once on someone's hands there is the risk of ingestion of this product – for example if hands aren't washed before breaks – which then increases the risk exposure significantly.
- Hexavalent Chrome is also classed as a non-recyclable product, so once it enters the environment, it remains there. This fact is relevant if any of your items need to be disposed of in the future. This is exactly the reason why the automotive industry has banned its use from 2007, as cars will have to be recyclable. Other sectors of industry will undoubtedly follow their lead.

Where the problem lies...

Hexavalent Chrome (Chrome VI) is found in the yellow passivate we use. None is present in the clear passivate. As you can see from the table on the previous page, the yellow passivate itself is very effective at producing excellent corrosion performance, and that is why it is used extensively.

This issue has been around for some time now, and the problem is that the large chemical institutions have found it difficult to produce an alternative which not only gives the same corrosion performance, but doesn't contain any Hexavalent Chrome.



The alternative...

After a number of years in development, an alternative passivate has now been produced which not only contains no hexavalent chrome, but also gives the same if not better corrosion performance.

We have been actively using this alternative passivate on a few selected components for some time now, and the results achieved have been very good.

The only difference you may notice is that it is not 'yellow' in appearance – please see attached sample to give you an idea of the colour produced.

Initially you may also find a slight increase in the plating cost of each component, as the alternative chemistry required is currently very expensive. However we will discuss with each and every customer any cost implications.

Responsibility...

As with all aspects of our business, it is purely customer driven. The timescale of the introduction of this alternative chemistry is entirely based upon when it's required by all of our customers. We all run our businesses as responsibly as possible, and we all have a duty of care towards both employees and the end user. Hopefully you can see from all the above why we should look at introducing this alternative chemistry sooner rather than later. Indeed by talking to one or two of our valued customers, this process has actually proven to be a valuable marketing tool to give them additional product enhancement.



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