

COMMENTS AND RESPONSES TO COMMENTS

Substance(s): Chromium trioxide

EC number: 215-607-8

CAS number: 1333-82-0

Detailed information about the uses: Use of chromium trioxide in solid form and in aqueous solution of any composition to modify the properties of surfaces made of metal or plastic, with or without current flow, in category III.

Consultation number: 0064-02

Legal entity name: HAPOC GmbH & Co KG

Consultation period: 27/04/2016 - 22/06/2016

NOTE:

The responses which are compiled here have been incorporated in identical form into the parallel processing of the uses 0064-1, 0064-2, 0064-3 and 0064-4.

Fundamental responses, applicable to all comments:

1 Assessment of the comments received and content-related classification

1.1 Classification in the context of the dossiers submitted

1.1.1 Reference to comments regarding previous applications for authorisation

Following the comments that have already been made and further discussions, the applicant would like to state at the outset that the requested product "surface modification by chromium trioxide" differs from the end customers' products that are the primary focus of the discussion that is taking place.

For this reason, the main focus is on presenting the assessment of the possibilities for using an alternative by the service provider. The aim of the dossier is to present this.

It is therefore emphasised that the consideration of specific products is done primarily by the end customer, but increasingly in cooperation with the instructed service provider. It should be borne in mind here that, due to the service provider's business model, it has numerous end customers and must offer, stock and deliver an extensive range of properties as products.

The applicant therefore points out that the comments received, which relate to specific end products of the customer and possible alternatives to them, can only be used to a limited extent by the service provider on its own.

At the same time, the applicant emphasises that the contents of the comments, for the decision-making process, frequently represent the state of the art that has long been in use. For this reason, analysis of the comments from the applications for the authorisation of

chromium trioxide that have been discussed previously shows that in the end they must be repeated and differ only in the detailed wording. This is why, in the following responses, reference is also made to the contents of previous public consultations in order to highlight the similar arguments and the differences to allow a comparison to be made. The link to the previous consultations is referenced by appropriate citations.

1.1.2 Reference to other applications

As part of responding to the comments, the applicant has attempted to place its own application in the context of the applications submitted. The aim is to substantiate the significance of the uses set out in the application for the service provider and its customers.

The available uses are presented from the specific perspective of the applicant. This describes the perspective of the end customers of the service provider.

In most cases (20 dossiers), the 28 applications and uses which are available for sorting document the importance of functional chromium plating (application 1 of the applicant's dossier). Depending on the material, this is variously associated with anodising (application 6 of the applicant's dossier).

A further use (5 dossiers) is decorative chromium plating (application 2 of the applicant's dossier) together with pre-treatment (application 5 of the applicant's dossier).

But further applications of the applicant (applications 3/electropolishing and 7/stainless steel dyeing) are also requested.

A further analysis reveals that the applications 3 (electropolishing) and 4 (decoating) are part of the overall production process or of necessary after-treatments.

It is important to the applicant to emphasise that this also documents from the other side that the applications described in the dossier are essential in their entirety for the production process.

However, in contrast to the dossier presented by the applicant, no differentiation is made between them due to the focus on the end product.

But this differentiation is of crucial significance to the service provider. What the dossiers have in common is that the requirements (specific cases) set out in the applications meet the requirements of the end customers of the service provider.

Furthermore, it is also important to the applicant to emphasise that the application in no way opens the floodgates to "uncontrolled" use but rather, particularly due to the precise nature of the portrayal of the need for the applications in the production process, enables an overview.

1.2 Summary classification of the comments

Of the 77 comments received (adjusted to remove duplications in each dossier), 37 can be attributed to the service businesses (coaters and surface treatment firms), 28 to their customers and 7 to interest groups (associations and authorities).

Five comments represent surface treatment processes for specific applications and one comment casts doubt on the substantive basis.

1. **From the point of view of the service businesses**, the following arguments are cited:

- The variety of requirements is presented due to the variety of products to be treated and supply chains. The “product” for the service businesses is the use of chromic acid for a variety of surface modifications as part of a range of applications. In contrast to the end user’s products, this represents a refinement of its products. Without the component from the end user, this service cannot be provided.
This is why the applicant has sought to present its case jointly and with a close link with the end customers that have presented the use of the product “surface finishing” for their various end applications in the comments.
- It is emphasised that the alternatives which are discussed are known for special applications and in some cases may be capable of delivering certain functions of end products/components of the end customers. However, the functions which the end customers demand are specific to their individual products/components and only cover a small proportion of the uses of the product “surface finishing by means of chromium trioxide”. The product “surface finishing” of the service providers covers a much broader and more diverse implementation of possible functions of the end product of the end customers. This is discussed and set out in detail in the dossier.
- It is frequently stated that the known alternatives available in the market are continuously being examined either by the surface service provider itself or jointly with the customer to determine a possible use.
- It is further emphasised that the methods which are currently being discussed as alternatives have already been known for a long time and have either demonstrated their suitability for specific, closely defined component uses or were not able to establish themselves.
- It is emphasised that the use of the product “surface finishing by means of chromium trioxide” is the basis for the work done by the service businesses and that, if this use is not sufficiently safeguarded, this will result in the closure of many businesses and therefore a loss of jobs due to an unstable basis for doing business. It is likewise stated in the comments by the service providers that this influences not only their own economic development but also affects the customers of the service providers.

2. **From the point of view of the customers**, the set of requirements needed for the specific product is underlined (not just chromium plating but also surface finishing and after-treatment).

A distinction should be made between the direct customers of the service businesses, which are frequently suppliers themselves, and the end customers, whose product is not processed any further.

- The comments which are presented describe the need to use chromium trioxide for coating and for advanced surface finishing, for example by staining or dyeing.

- What is striking is the large number of series of tests for assessing new technologies. In the view of the applicant, this shows that the choice of suitable processes is determined by the requirements of the customers or end users. The requirements here comprise not just technological and economic ones but also ecological requirements and those associated with managing risk.
 - However, in the overwhelming proportion of cases reported, other technologies are not able to achieve the required functions and quality standards.
 - Reference is furthermore made to the frequently outstanding approvals of the end customers, e.g. automotive, aviation or defence. The official approval by authorities is also addressed.
 - **It is clearly underlined that, right across all metal-processing and plastic-processing sectors, there are currently only alternatives to the use of chromium trioxide for chromium plating or for surface modification of the material itself in specific individual cases. This underscores the wide significance of chromium trioxide for the development of industry as a whole. It also emphasises the special position of the service providers which are reliant on the end users' product and therefore only have their own substitution possibility to a limited extent.**
3. **From the point of view of the alternative providers**, the processes are understood more and more to be additional offers within the framework of the discussions of the public consultations. They are specific applications which are suitable for a specific product. None of the offers considers the property profiles which are set out in the dossiers in full or proposes assessment criteria for selecting a suitable process. Selected properties are always considered.
- This is also confirmed by the experiences gained from the comments made in the applications for authorisation which have been submitted to date.
- For instance, HEF-Durferrit (Ref. 1031) cites the process presented as having already been in the market for 40 years. It should therefore only be regarded as a special process. Specific details are provided in the comment.
 - Oerlikon-Balzers (Ref. 1149) has, over the course of the various commenting procedures, presented both a plasma-diffusion process as a substitute for hard chromium and a combined PVD coating process as a substitute for decorative chromium plating. In the current commenting process, only the PCD coating process of ePD is presented. It is also outlined that **"As new technology, ePD is of course not a 1:1 chemical replacement of chromium VI. As such, it is neither always possible nor useful to compare any alternative directly, because of the very different characteristics."** This confirms that the process definitely produces additional characteristics and thus represents an addition to the existing processes but not a replacement.
- The process is therefore also not seen as a 1:1 alternative by the supplier.
- Likewise Poligrat (Ref. 945/electropolishing and 948/colouring) has already commented in other consultations. The processes presented have also been in the market for many years (Ref. 945) or are a new offering (Ref. 948), which means that they cannot be rated in comparison.
- Specific details are provided in the comments.

- The latter also applies to the offering from Savroc (Ref. 1160). What is presented is a newly developed offering for supplementing the coating processes based on nickel-phosphorus layers in combination with chromium layers comprising Cr(III). This is therefore based on many years of experience and offerings of nickel layers and is thus to be regarded as more of an addition to these layers.
Specific details are provided in the comment.
 - **It should be noted that the possibility of a 1:1 replacement which was outlined initially by the alternative providers has been withdrawn. It is apparent that all processes have their authorisation and areas of application. It is confirmed by the end users that only the processes which use chromium trioxide deliver the wide range of applications which meet the requirements of customers on which the service offered by the surface coating businesses is based.**
4. The comment by ChemSec is to be regarded **as a special case**. In this comment, it is noted that there would be sufficient alternatives which just needed to be exploited. However, the person commenting has failed to take account of the need to assess how the various processes can be implemented. At the same time, all processes are assumed to have equal standing alongside one another. This fails to take account of the fact that many of the processes cited have already been in the market for a long time and, although they have demonstrated their suitability for individual, specific applications, in no case do they deliver the full spectrum of properties that the service provider offers.
This is now also increasingly accepted and presented by the providers of the parallel technologies.

This is why the applicant emphasises that this very challenge of implementation in practice is a central point of the dossier. It is imperative for the commenter to bear this in mind as just listing ideal wishes, potential possibilities or ideas is far from satisfactory in practice.

2 General responses and important prerequisites from the dossiers

1. The analysis performed for the application for authorisation relates to the typical use of a surface-finishing service provider, which may result in various applications. **The analysis does not consider specific products, articles or their applications.** In fact, priority is given to the variable use of the substance by a surface-finishing service provider. This is necessary because it is the use of chromium trioxide that is to be authorised, and not the final use of the surface-modified component or article (which, in the scope of this application, does not contain the substance requiring authorisation). The latter are not influenced nor can be selected or modified by the surface-finishing service provider, rather they are always specified by the client.

2. The applicant defines conditions to be fulfilled by a downstream user in order to make use of the present authorisation and to be supplied on this basis. The applicant places particular value on a level playing field. Furthermore, it wishes to provide its own documented evidence that downstream users comply with the general conditions required for the authorisation. There should not be sole reliance on national implementation.
3. The aim of the analysis is to identify the possibilities that a surface-finishing company (service provider) and its customers may have to use another technology, and to evaluate and achieve its implementation (economic feasibility, cost-effectiveness and risk potential).

The surface-modification company itself has no possibility of reducing the risk by independently changing the technology because it would thereby have to give up providing its service as part of various supply chains.

However, it is possible for the company to optimise its own plant with a view to minimising a potential risk.

For surface-modification companies, most of the parallel technologies that are being assessed and considered are still at the development stage or have already been adapted multiple times.

Every kind of conceivable substitution of chromium trioxide-based uses needs to first be evaluated on this basis of the current situation. If the same or similar circumstances or risks are established, this solution should be rejected.

A swapping of risks (e.g. long-term against acute) must be avoided. In particular, the technical solutions whose intrinsic properties suggest that they will likewise need to be authorised may not be considered. The applicant attaches particular importance to this in the responses to the comments in the consultation.

2.1 Reference to criteria presented in the dossier which show the applicant's point of view.

In the dossier submitted, the majority of the conditions to be considered for assessing use are outlined in detail.

In order to outline the standpoint of the responses to the received comments which are presented here, the applicant would at this point like to list fundamental points once more:

- The service provider offers a wide variety of functions. Each (including future) product of the customer will be treated with the fundamentally available use of chromium trioxide – the customer determines the specific suitability for the component in advance. This means that the service provider offers a large number of different applications (products of the company) which are listed in the dossier.
- The customers need to be able to access a whole range of functions offered at competitive terms by the service provider (as its product).
- The potential alternative must have demonstrated its applicability in daily production or in meaningful field trials.

- The potential alternative guarantees the same functionalities that are ensured by the current process. This must also ensure that scrap is not increased in the life cycle of the end product, i.e. the working life and durability of the components is comparable with the current situation. Values of 90% of the present situation are assumed at this point to be a plausible basis to be able to present an alternative.
- Technologies suggested as potential alternatives must also demonstrate their feasibility in secondary aspects, such as their capacity for refurbishment, post-processing, waste water treatment etc.
- The potential alternative does not use any substance that is listed in Annex XV or that is being discussed for inclusion in Annex XIV or that has the corresponding intrinsic characteristics.
This must currently be considered for technologies that use nickel metal or nickel salts, boron compounds, such as boric acid or nanotechnology materials that have been discussed.
- The potential alternative processes need to present their safety and performance in the same way as the chromium trioxide-based processes; in a manner that is public and can be verified and reproduced. This is typically demonstrated by approval by the end customers (OEMs).
- The processes of customer approval of the potential alternatives must be able to be completed promptly and be cost neutral.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:161 Date: 2016/06/22 Type of comment :*	Affiliation: Individual Type/Role in the supply chain: Name of org/company: Country: Finland					Savroc TripleHard is trivalent chrome based cost efficient alternative to hexavalent hard chrome. The TripleHard technology is already working in the industry.		Comment 1161 Attachment .zip
Applicants' response:								
Preliminary remarks:								

It should be noted at the outset that before submitting the application for authorisation, the applicant endeavoured to obtain more detailed information about the suitability of the "Savroc application". The reason for this is the high marketing presence at various events and the applicant's experiences with other comments.

The applicant would like to begin by pointing out that a key argument cited against the technology presented as a substitute for chromium plating from aqueous chromium trioxide is the use of substances which are likewise being monitored to determine whether they need to be classified as SVHC substances (nickel compounds) or are already listed in Annex XV (e.g. boric acid).

At the same time, the applicant sees comparability with the other processes proposed in this consultation (Ref. 1031/HEF-Durferrit, Ref. 1149/Oerlikon Balzers, Ref. 945 and 948/Poligrat). In these cases, the commenting parties have described their process ultimately as an addition to the chromium-trioxide-based processes, but not as a 1:1 replacement. It is to be expected that this will also apply to newly presented processes, such as the TripleHard process from Savroc.

For the reasons set out above, it is necessary to look at the technology itself in detail.

Unfortunately, meaningful information from industrial application is not currently available! Even on request, no further information could be obtained.

There was informative correspondence by e-mail which resulted in this allegedly new and "ground-breaking" technology not being pursued any further as firstly it is itself based on substances which clearly have an SVHC character (nickel compounds, boric acid), as it was not available on the market and its technical and economic feasibility could not be verified without needing to make a considerable financial investment in advance – this situation still persists to the present day.

Based on the information available, the applicant came to the following essential conclusions back in 2014:

1. As can be gleaned from the offer made by Savroc, application-oriented investigation of the technology and therefore of the envisaged implementation in the case of coaters as alternatives is not possible as it was rejected at Savroc's request. It is therefore also not possible to estimate what a company needs to do in order to effect a 1:1 replacement of its existing technology if applicable for functional chromium plating (further uses from the application for authorisation are not covered).
2. A comparison with the product range of a possible interested party is also not possible as only a few laboratory results are generated. A comparison with the properties of a functional chromium layer listed in the dossier is therefore not possible.
3. The patent shows a process consisting of combined Ni-Cr layers which subsequently need to undergo one or more heat treatment processes. As a multilayer process, as well as high investment costs considerably higher operating costs are therefore also to be

expected. Furthermore, it must be noted that not all coatable base materials and/or their processing or structural states (e.g. hardened) are suitable for a heat treatment. The high temperature load may trigger annealing and diffusion processes which crucially have an adverse effect on the material properties of the component coated with TripleHard and therefore preclude its suitability for practical use.

4. Savroc says itself that the process needs to be adapted depending on the product. Substitution in general is therefore questioned by the supplier itself.

Results from the investigation in 2014 by industry representatives:

- Nickel salts are themselves SVHC substances. They are therefore not a sensible alternative!
- Nickel plating (Ni-P) in the high-phos range is electroless - the complex inorganic chemistry demands, in contrast to Cr-VI, complicated waste water treatment, which has to be retrofitted and newly approved in most businesses.
- Chemical nickel plating (NiP) is a process that has long been used and complements chromium plating. The NiP layer as such is sufficient for achieving certain properties, but was not able to replace a chromium layer (see here also the results of the HCAT project presented in the dossier).
- The process cannot be found in mass production, the required investments could not be checked as no information was opened up and made accessible here.
- It is highly likely that the process will not be economical as previous hard chromium products had to undergo a more costly multistage process (nickel plating, chromium plating, heat treatment). The secondary waste-water treatments additionally increase the costs.
- The process certainly requires an expansion of the production facility as two additional steps need to be carried out (Ni coating, heat treatment).
- The heat treatment is generally not possible for highly stressed parts – as is normal in the case of hard chromium plating – as there would be a negative impact on their mechanical properties. This is already presented in the process which is presented by HEF-Durferri (Ref. 1031). Corresponding effects of a heat treatment are outlined in the comment made by Berndorf Bäderbau (Ref. 908).
- There is no capacity for repairs to be made; defective surfaces must be completely removed.
- Non-porous nickel plating may necessitate intermediate grinding processes, which is not possible on all components, makes the process even more expensive and in many cases requires new investments and even poses a risk to health and the environment (abraded dust containing nickel).
- The only thing that exists at present are Cr-III solutions which have boric acid as the essential electrolyte constituent. This is listed in Annex XV and therefore cannot be used for developing an alternative.
- The “Savroc application” does not correspond to all chromium-trioxide-based service applications. Consequently, even in the event that this technology is suitable as a supplement to functional chromium plating, existing technologies would have to be

retained or (if authorisation is not provided) investments would have to be made in further technologies. This is generally not economically feasible, in particular for the typical SMEs in the coating industry.

- Chromium-nickel combination layers represent common technology with Cr-VI solutions. Any type of corrosion comparisons would therefore need to be based on these combination layers and not on simple chromium layers. It can be assumed that Cr-III on nickel will not have any better corrosion figures but will tend to have corrosion figures that are worse than Cr-VI on nickel. In earlier comments in relation to chromium trioxide authorisations, there have been many contributions from the automotive industry in this regard (see authorisations 0032).

In order to examine whether there have been any changes to the assessment described above, the inputs and documents which Savroc has provided will be discussed and assessed below:

1. Fundamental aspects

The applicant's dossier comprises a use of chromium trioxide to provide a service. This relates to a full package of surface modifications that can be offered by using chromium trioxide. As is comprehensively outlined, the use is not for the purpose of manufacturing specific products or articles, but rather it is a service with a wide range of applications. Functional chromium plating is just one of these applications. For this application alone, the commenter claims to have found an alternative. It should therefore be recorded that it does not relate to the dossier as a whole, but merely parts of it.

It should be emphasised that the discussion regarding the capacity for using the process presented by Savroc must take place in the same context as the one regarding the other processes presented (in the current consultation Ref. 1031/ HEF-Durferrit, Ref. 1149/Oerlikon Balzers, Ref. 945 and 948 / Poligrat).

2. Procedural aspects

During the course of preparing the application for authorisation, it was pointed out repeatedly that developing an alternative which likewise uses SVHCs does not make sense. The ECHA and Commission now also recommend examining in advance (PACT, CoRAP, Annex 15) whether a substance which is used could with a high degree of probability be added to Annex 14 on account of its intrinsic properties. Such substances should be avoided in order to ensure that the innovative research and development does not become worthless. Now the proposed "Savroc application" TripleHard is based on a base layer of nickel which needs to be deposited in the overall process from nickel compounds whose properties mean that they are classified as belonging to the SVHCs.

France is currently working on a corresponding RMOA in relation to nickel compounds – as things stand at present, both occupational exposure limits and authorisation are being proposed as regulatory measures. The conclusion should therefore be drawn that a technology, such as the "Savroc application" cannot represent a sensible alternative. **But in particular Savroc's claim that the application is an "alternative to Cr3, Cr6 and Ni-based coating technologies" (see "Analysis of Savroc TripleHard as an alternative", submitted by the commenter itself) is to be refuted. This statement is incomprehensible due to the use of nickel and Cr III compounds and contradicts the available publications.**

3. Technical aspects, feasibility

First of all it should be stated that the "Savroc application" draws an inadmissible comparison. The application is evidently a combination of a nickel base layer, chromium layer and subsequent thermal treatment. The combination of these processes is well known from conventional functional chromium plating. The only difference between the "Savroc application" and the requested use is the alleged use of Cr-III-based processes for the chromium layer. Consequently, the comparisons of the technical properties are to pertain only to the chromium layer. If the nickel base layer and the thermal treatment are to be incorporated, analogous processes with Cr-VI-based chromium layers must be used and not chromium layers on their own, as the commenter has done! For this reason, the present application for authorisation has also been related inter alia to any desired metal surfaces, also including nickel of course! The consequences of this approach which is required for an objective comparison are discussed in more detail further below.

Furthermore, it should be recorded that the present comment only relates to parts of the requested use of chromium trioxide. As is discussed in detail in the dossier, the requested use allows different applications of chromium trioxide on surfaces. In some cases, the aqueous solutions/baths of chromium trioxide can be utilised without modification for various applications. The "Savroc application" which is cited is not capable of this, which means that the requested use cannot be fulfilled.

In the document entitled "Analysis of Savroc TripleHard as an alternative", the commenter analyses the suitability of its application itself. In 4.1, it discusses technical advantages based on hardness, abrasion resistance, adhesion and corrosion. The dossier discusses more than 30 different properties of the functional chromium layer and the process, most of which are ignored by the commenter. The applicant has proposed a method in the dossier for how the suitability of another technology as an alternative can be determined. What is important here is to fully compare the necessary properties. As the commenter claims to be able to offer a complete replacement, such an analysis would be necessary. The applicant is unable to perform this analysis because – as was stated above – it has not yet been provided with the necessary information.

In 5.1, the commenter discusses the properties of the surface layers which result from the different uses of SVHCs (it should be pointed out once again that this only accounts for part of the requested use!). Imprecise, in some case inaccurate details were provided here, which has a significant impact on the subsequent analyses, e.g. in relation to economic feasibility:

- a.) The layer thickness which can be achieved for functional chromium coatings is not 15 – 150 µm (unit is missing in the document, µm are a plausibility assumption). Rather, a few µm up to several millimetres (\Rightarrow 1000 µm) can easily be deposited.
- b.) In contrast to the details provided in the document, the coating rate that can be achieved is more than 100 µm/h and even up to 1000 µm/h with an appropriate hydrodynamic design.
- c.) The specification "Micro cracked" cannot be used for the purpose of assessment here. Functional hard chromium layers can also be deposited without any cracks ("hot chromium"). If suitable deposition parameters are chosen, functional chromium

layers can have 0 cracks per centimetre (= crack-free) but also more than 800 8?) cracks per centimetre. Depending on the specification, a corresponding adjustment of the surface properties is made here. Whether the "Savroc application" has similar flexibility is not known to the applicant (for the reason already mentioned above in 0032).

The document submitted by the commenter "Annex 10. Comparison tests_Hex-Cr vs. TripleHard.pdf" details allegedly detailed comparison tests between the TripleHard application and the conventional Cr-VI-based chromium plating. As was already stated at the beginning, these tests cannot be applied overall because they are not comparing technologies of the same type.

- a.) The nickel layer of the TripleHard application is itself generated using hazardous substances which have the properties for inclusion in Annex 14 (nickel compounds). Such layers may of course also be provided without any problems under chromium layers produced on a Cr VI basis. Layer systems of the same type are therefore assumed below in order to be able to compare the layer properties under the same conditions.
- b.) By its own admission, the chromium layer in TripleHard is deposited from Cr-III-based electrolytes. The only systems in use on the market are those which contain boric acid as the essential component. As no more precise information is provided, it must be assumed that TripleHard is also applied using boric acid. Boric acid is itself listed as an SVHC in Annex XV – it must therefore be assumed that this substance will require authorisation in the foreseeable future. The recommendations of the ECHA and Commission are that such technologies should not be pursued any further.
- c.) Results from salt spray tests are quoted on pages 4 to 8. They are alleged to suggest improved corrosion resistance resulting from the "Savroc application" TripleHard. In fact, the corrosion resistance of such a layer system can be attributed to the effect of the nickel base layer. This knowledge can be found in any textbook and does not require any further evidence. Chromium VI layers with a nickel base layer have at least the same levels of corrosion resistance; due to the higher corrosion resistance of the Cr-VI-based chromium layer in comparison to the Cr-III-based layer (this is down to the unavoidable foreign substance deposits resulting from the complex chemistry of the aqueous Cr III solutions), a slightly better level of corrosion resistance is in fact to be expected.
- d.) Page 1 suggests a higher hardness of the TripleHard compared to the Cr 6 reference. This is to be expected to the extent that TripleHard has undergone an additional heat treatment. No more detail is provided on the type of heat treatment; but as chromium does not have a hardness of 1800-1920 HV in any depositable crystalline form, it is entirely possible that, as a result of additives in the heat treatment, carbides or possibly nitrides are formed and they are responsible for the additional hardness. If the Cr 6 reference is subjected to a similar heat treatment, the same carbides are formed – the reaction is typical of chromium and not dependent on the starting material (Cr-III or Cr-VI). On the contrary, this reaction will be even better with a pure metallic chromium layer which is generated from a chromium trioxide solution because the chromium layer generated from chromium(III) solutions constitutes an alloy layer which very often contains iron (this iron which is incorporated into the chromium layer in the chromium(III) processes is responsible for its unsuitability as a decoratively functional layer (see FGK authorisation request) and the colour sample results which were presented at the "Chrom2020"

technical symposium on 10 November 2015 in Niedernhausen (near Wiesbaden, Germany) in the presence of an ECHA representative). The nature of the presentation therefore suggests an alleged technical advantage, but this does not exist under the same conditions.

- e.) Page 3 suggests a similar correlation for the abrasion resistance as for the hardness (see previous paragraph). A similarly heat-treated Cr 6 reference will have at least the same properties.

On the contrary, this reaction will be even better with a pure metallic chromium layer which is generated from a chromium trioxide solution because the chromium layer generated from chromium(III) solutions constitutes an alloy layer which very often contains iron (this iron which is incorporated into the chromium layer in the chromium(III) processes is responsible for its unsuitability as a decoratively functional layer (see FGK authorisation request) and the colour sample results which were presented at the “Chrom2020” technical symposium on 10 November 2015 in Niedernhausen (near Wiesbaden, Germany) in the presence of an ECHA representative). What is interesting is that Savroc indicates the alleged advantage with just half the layer thickness of the Cr VI reference, whereas in the subsequent economic analysis a layer thickness which is three-quarters lower than is mechanically sufficient is assumed. The consumption values have obviously been modified there.

4. Economic aspects, feasibility

It should first of all be pointed out that the commenter only refers to some of the areas of application of the requested use. As is set out in detail in the dossier, it is not economically feasible for the target group of the dossier to replace just parts of the use – reference is explicitly made to the statements made in the socio-economic analysis. The commenter does not adopt any position in relation to this, therefore does not set out the extent to which its technology can be a substitute for the requested use. It also does not state how a partial substitution could be economically viable (provided it were technically suitable, which has already been refuted previously). The commenter itself comes to the conclusion that its technology is at least of comparable cost to galvanic chromium plating. Its technology therefore meets one of the factual circumstances discussed in the dossier, which indeed does not satisfy the economic feasibility for the requested use.

In the document entitled “Analysis of Savroc TripleHard as an alternative”, Section 5.3, the commenter compiles its arguments in relation to economic feasibility:

- a.) Details are provided in relation to the alleged costs of the fees for authorisation. The question that arises here initially is whether fees in the case of a neutral authority should influence the economic feasibility of a technical solution. But above all the assessments made by the commenter for the present application are far from accurate. The undifferentiated approach indicates that the commenter has insufficient knowledge of the authorisation process.
- b.) The document “Annex 5. Cost Comparison Automatic Shock Absorber Plating Line_Galvatek” is written in Finnish and – in contrast to all other comments – has not been translated into English.
- c.) The document “Annex 4. Cost calculation manual operation.pdf” compares some pieces of data of TripleHard and Cr-6 with one another. This is allegedly comparative data for a manually operated facility. The compilation of the electrical energy

costs merely shows that the costs per component allegedly differ by a factor of 4. This corresponds precisely to the difference in layer thickness. Two facts should be highlighted from this:

First, it is unclear why different layer thicknesses were chosen. It was evidently assumed that just 20 µg of functional chromium were comparable with 5 µm of TripleHard. No reason for this is provided.

Second, the current efficiency in the case of TripleHard is evidently considerably lower. This conclusion can be drawn simply from the fact that, with the same layer thickness (so the same volume and mass), the costs are allegedly only reduced to a quarter. If the current efficiency were the same, an additional factor of 2 would be expected as with TripleHard deposition takes place from Cr-III and not from Cr-VI. The current efficiency of the TripleHard process for chromium deposition is therefore at least twice as inferior as conventional functional chromium plating processes – although this only applies to processes with current densities of $\leq 50 \text{ A/dm}^2$. In addition, the current efficiency of the processes for conventional functional chromium is significantly higher.

According to information from the commenter, the chemical costs with the TripleHard process are almost twice as high overall (nickel compounds plus chromium compounds) as they are with the Cr VI application. Per component, the commenter arrives at a figure that is 102.3% higher than with the Cr VI process. This fails to take account of the fact that the use of the nickel base layer requires additional expenditure in the area of waste-water cleaning. In contrast to the Cr VI process, measures for removing complexing agents need to be put in place and implemented here. The commenter has obviously forgotten to allow for the costs in this regard. The TripleHard process may well therefore result in considerably higher additional costs.

The details provided about the costs of the heat treatment are general and impossible to verify as no further specifications about the process were made.

Lastly, the commenter makes likewise unsubstantiated statements for the purpose of comparing the productivity of the two processes. Astonishingly, it arrives at a throughput that is higher by a factor of 2.13 in the case of the TripleHard process even though, with heat treatment and nickel coating, additional process steps need to be carried out. In addition, the chromium deposition is only faster by a factor of 2 in spite of only a quarter of the layer thickness. Even assuming that for comparison a quadruple layer thickness of the Cr VI process is required – which the applicant considers implausible and is not substantiated by the commenter – the assumptions in relation to the astonishingly higher production rate appear incredible. But without this assumption, it can easily be verified that the TripleHard process cannot harbour any cost-related benefits (see also under 5.).

- d.) It is known from the earlier consultations regarding the use of chromium trioxide – in particular for decorative-functional surface coatings – that the Cr-III coating does not have any financial advantages over the use of chromium VI. The present application for authorisation also provides clear details in relation to this. It is therefore implausible to assume that a technology which replaces Cr-VI with the more costly Cr-III and in addition involves further process steps could be cost-effective. It is obvious that such a change of technology from Cr-VI-based functional chromium plating to TripleHard will

entail a noticeable increase in the operating costs. Along with the not-insignificant investments that are required (nickel coating, heat treatment, additional room capacity), the positive assessment from Savroc is extremely doubtful. But above all, such a change of technology is not economically feasible particularly for the target group of the present application.

e.) The document "Annex 5. Cost Comparison Automatic Shock Absorber Plating Line_Galvatek.pdf" includes a cost comparison for chromium-plating lines once using Cr-6, and once using Cr-3. This document is of very limited informative value for the following reasons:

- There is a lack of detail on the reasons for various differences between the facilities;
 - It is not clear why the capacity of the cranes is different even though the components are supposedly the same (otherwise a comparison would be completely pointless).
 - It is unclear why the Cr-6 line should have a higher energy requirement – during the coating, in contrast to the Cr-3 version, additional heat is produced which means that the bath does not need to be heated; nevertheless the commenter reputedly reports a lower heat requirement in the case of Cr-III (calculated from 330kW-176kW = 154kW as the 176 kW supposedly have to be deducted for the heat treatment).
 - The difference in the costs for the tanks is measured very low: First of all, the additional Ni tanks are to be made from costly stainless steel; the lower throughput during chemical nickel plating means that a range of tanks need to be provided here. In addition, the specification for the heat treatment furnace, which is also to be designed to be large, is missing in order to guarantee the stated throughput for the overall facility.
 - The calculation ignores the cost comparison for the waste-water treatment, which looks to be considerably more extensive due to the additional use of boric acid, complexing agent and nickel in the Cr-III version than in the case of Cr-VI (all that needs to be provided here is a reduction (=precipitation) with a sludge press). In addition, some of the waste water from the Cr-VI line can be recycled, which is ruled out in the case of Cr-III due to the foreign-matter sensitivity (in this regard see also comment Ref.1083, here: page 9, point 3.a)

Unfortunately, the company Savroc has declined to respond to a request to carry out a direct comparison in existing facilities for the use of aqueous solutions containing chromium trioxide. The cost comparisons are therefore hypothetical because the framework conditions are unknown – just like the practicability of the installations (which are not described).

The cost comparison in the document "Annex 5. Cost Comparison Automatic Shock Absorber Plating Line_Galvatek.pdf" is therefore worthless as it cannot be transferred to the target group of the dossier and also does not permit any objective review.

5. Miscellaneous

In the document "Annex 9. Emission and Impurity Analysis of TripleHard Laboratory by Työterveyslaitos.pdf", the commenter states that its TripleHard application is already integrated in an existing coating line. However, the website of the company

Tecnocrom, which is named here, does not feature any reference to this. The applicant has so far not received any response to a request for further information made via the contact form on the Tecnocrom homepage on 13.07.2016.

Furthermore, the commenter states the following in the document:

"(...) The typical electroplating process used by Tecnocrom made the modification very easy. Only an additional plating vessel for TripleHard chemistry was required. (...)".

This sentence must be questioned as the intention is to achieve substitution of a Cr-VI technology with three different technologies: chemical-nickel, Cr-III-based electroplating and heat treatment. It is interesting that the TripleHard technology is alleged to have already been integrated in an existing line with nickel coating. However, this means that the nickel layer is no longer a particular feature of the TripleHard coating. Rather, the TripleHard application which is proposed by the commenter cannot be used in contrast to the pure use of Cr-VI without nickel. The commenter thus confirms the assessment made by the applicant above in the "Technical aspects, feasibility" section.

Moreover, the heat treatment cannot be carried out in a galvanic "vessel". Appropriate equipment apparatus must therefore either already be in place or be installed separately. This means an additional investment and additional ongoing costs in the event of substitution of functional chromium plating based on chromium trioxide.

In addition, the chemical solutions used for coating are very sensitive to foreign metals, which means that at least additional rinsing steps are to be expected (in this regard see again comment Ref.1083, here: page 9, point 3.a) Additional investments and modifications of existing chromium-trioxide-based facilities will be required for this.

The document does not provide any comprehensible data in relation to any of these aspects, but rather limits itself to presenting purported benefits for the purpose of marketing. In addition, technological requirements are set that are not applicable to the requested use. The requested use does not require optional additional technologies, such as nickel coatings and heat treatments. A comparison with installations that already have these optional additions for other reasons is therefore inadmissible.

Without more in-depth insights and evidence, this document cannot be used for a technology comparison as different prerequisites are assumed (the commenter is comparing "apples with oranges").

6. Concluding remarks

In one of Savroc's patent specifications for TripleHard WO 2016/005651, reference is made to the publication by P. Benaben, "An Overview of Hard Chromium Solutions", <http://www.pfonline.com/articels/anoverview-of-hard-chromium-plating-using-trivalent-chromium-solutions>. The author's results originated from previous research projects looking at the substitution of chromium VI in hard chromium plating. The author is now attempting to create an alternative himself and is marketing it through the company Trion. However, this is technology involving coating from ionic liquids. This method has repeatedly been the focus of research, but it still fails due to the technical results, the costs and the unresolved issues of constant process control, electrolyte management and disposal. Accordingly, this technology also lacks any evidence showing its suitability for routine production under industrial conditions.

However, what is crucial is that even the author and protagonist, whom Savroc itself invokes, does not see any future for hard chromium plating from aqueous solutions. The combination with nickel and heat treatment is indeed, as has already been stated, no alternative to simple hard chromium.

In his promotional brochure entitled "Environmentally Friendly Chrome Plating Technology Developed at Innovation Park at Notre Dame in South Bend, Indiana, P. Benaben also stressed that the technology is to be used *"to help affected manufacturers and metal surface finishers manage the September 2017 sunset date established by REACH"*. The marketing exploits the fear that those affected have about the sunset date and appears to offer a solution. The same is true of Savroc with the TripleHard process. There is good reason why Savroc argues that the authorisation ought to be refused in order to be able to market its own product better. In regular competition, Savroc has evidently so far not managed to do this.

It should be pointed out that a similar argument was advanced in a previous consultation by the company Oerlikon-Balzers. As has been outlined, this company has now changed its line of argument. This can also be expected from the argument put forward by the company Savroc.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1155 Date: 2016/06/22 Type of comment: * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Imhof Hartchrom GmbH Country: Germany					Substitution of chromium trioxide is not possible as hard chromium plating produces surface properties (high level of resistance to corrosion and wear, high surface hardness, temperature resistance, chemical resistance, safe for contact with food) which alternative methods do not produce.		Comment 1155 Attachment .pdf

Applicants' response:

The company Imhof is constantly competing with parallel technologies. Nevertheless, the company Imhof maintains its market share. By its own admission, this is because no other technology delivers the necessary set of properties of chromium-trioxide-based surface modifications (see dossier, AoA). Switching to another technology would degrade the service, reduce to destroy the market share and therefore result in a production loss (see comment section 5). Consequently, the statements from the company Imhof correspond to the statements of the application for authorisation. Alternatives are not available. Together with the low risk of use (see dossier), the comment provides a solid foundation for authorisation with the requested term.

The company Imhof is testing the possibilities for modified and widespread use of alternative technologies in various applications. It has extensive experience in this area and is therefore ideally placed to help to develop the assessment in relation to usage and ultimately implement it. The experiences outlined in the comment have been incorporated into the applicant's responses which are presented here. In particular the assessment of the process of HEF-Durferrit (Ref. 1031) is substantiated by this.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1151 Date: 2016/06/22 Type of comment :*	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Heidelberger Druckmaschinen AG Country: Germany					We do not regard other alternatives to hard chrome plated surfaces to be equivalent. None of the analyzed alternatives shows a comparable or better behaviour compared to a hard chrome plated surface. The submitted documents are a translation of the letter in german into english language.		Comment 1151 Attachment .pdf

Applicants' response:

The company Heidelberger Druckmaschinen GmbH confirms the large number of surface properties that are achieved as a result of chromium-trioxide-based surface modifications. As a globally operating company, it competes in many different areas and will certainly be confronted with parallel technologies – results in relation to tests of them evidently exist, but have not been made public. As a result, the company has evidently concluded that the chromium-trioxide-based technologies, as are requested for authorisation in the present dossier, are absolutely essential for their products. Consequently, Heidelberger Druckmaschinen GmbH supports the application in order to be able to maintain its own production and its own supply chains.

Reference number	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	

and date:								
Ref.No: 1149 Date: 2016/06/22 Type of comment : * The comment provides information that is generally not in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Oerlikon Balzers Coating Germany GmbH Country: Germany					Oerlikon Balzers' ePD™ (embedded Physical Vapour Deposition (PVD) for Design parts) is a combined technology of UV coatings and vacuum metallisation in the nanometer range. It replaces the entire electroplating process, including pre-treatment and post-treatment.		Comment 1149 Attachment .pdf

Applicants' response:

1. Responses / remarks in relation to the comments

Classification of the process by the commenter:

In the general presentation, the commenter refers to its process as

„Oerlikon Balzers' ePD™ (embedded Physical Vapour Deposition (PVD) for Design parts) is a combined technology of UV coatings and vacuum metallisation in the nanometer range. It replaces the entire electroplating process, including pre-treatment and post-treatment”

In the full comment (background dossier), this statement is qualified in that the process is portrayed as **one** possible alternative under certain circumstances, but this does not allow any direct comparison:

“As a new technology, ePD is of course not a 1:1 chemical replacement of chromium VI. As such, it is neither always possible nor useful to compare any alternative directly, because of the very different characteristics. The acceptance of the technology from the Original Equipment Manufacturers (OEMs), who are the user of the alternative technologies to Chromium VI e-plating, is consequently much more important as a benchmark. Oerlikon has obtained very positive feedback from OEMs so far on its new technology and the demand for ePD is continuously increasing.”

This statement can be confirmed by the applicant to the extent that the process which is presented can be and already is used successfully for certain products. It also underlines the representation of the comment that the level of acceptance among the end customers is the crucial criterion for possible use.

The applicant will closely watch further developments, and actively shape them if possible.

2. Testing of the process by the service providers

Due to the current discussions (in particular the information concerning the CTAC authorisation requests), the service providers stepped up their contact with Oerlikon Balzers. The aim is to be better able to assess the layer systems on offer as well as their advantages and disadvantages.

The essential result is that the statement outlined above, that a direct comparison let alone a substitution of chromium plating is currently not possible, is confirmed. For example, it has not yet proven possible to replace an established hard chromium layer with PVD. The alternatives discussed are regarded as additive processes which, depending on the particular requirement, satisfy very specific characteristics which cannot always be provided with chromium. It should likewise be mentioned that ePD and HED (both the decorative processes from Oerlikon Balzers) are not capable of coating simple iron and steel materials. For instance, the HED process is only capable of coating corrosion-resistant base materials (stainless steel or chemically nickel-plated steel) as a pure PVD process. Although other “single” or only “slightly alloyed” iron and steel base materials – the overwhelming majority of which are used in the metal-processing industry – can be coated with HED, they do not display any resistance to corrosion (statement from OB to a service provider that made an enquiry). According to information given by the commenter to a service provider, the ePD process has previously only been applied on plastics as the substrate. It should be mentioned that ePD and HED processes are not capable of coating the customary component sizes in the metal-processing industry (e.g. 50 x 50 x 50 cm) in an economical way as among other factors there is a lack of suitable coating facilities; an ePD facility with a plate size of 1600 mm x 400 mm is currently being developed. These dimensions show that the conventional components that have been mentioned cannot be introduced into the coating chamber!

Both OB processes (ePD and HED) have already been on the market for 10 years and have been unable to displace decorative functional chromium plating.

3. Reference to previous applications (here CTAC):

Here too the applicant would like to refer to the comments made by the CTAC:

“The technology Oerlikon Balzer is presenting is well known by the industry. The technique is referred to as “Lacquer+PVD” in the AoA of Use 3. The following statements were consolidated from companies from several sectors, which performed numerous tests with this technology. It can be clearly concluded that the performance presented from Oerlikon Balzers Coating Germany GmbH is not consistent with the experience from industry.”

“Oerlikon Balzer mentioned several times that its technology is free of boric acid while concluding that “Boric acid is currently used in the functional chrome plating process.” [Cr(VI)]. This statement is misleading. The chromium trioxide based baths do not contain boric acid. However, the entire process also includes nickel baths that contain boric acid.”

“- Most importantly for a potential use of this technology is the current non-compliance with drinking water legislation. As stated in the document (p.8), a UV lacquer is applied as top coat on the products. These lacquers have to be cured before the product can be used. UV lacquers are generally not limited to the outside of the product, but can also diffuse to the inner geometry (inner waterways) of a substrate. The curing procedure may not reach to the amount of lacquer in the inner waterways. Consequently, residues of non-cured particles can remain in inner geometries. UV lacquers are known to contain substances where an approval for materials in contact with drinking water is not likely to be granted. As of today, this issue is not solved, so that an approval for these UV lacquers will not be granted in terms of drinking water compliance. Referring to the AoA (p36), it is expected to take at least 10 years from the decision making for an alternative, until product safety and approval for the use in contact with drinking water has been achieved.”

As a result of the experiences mentioned above, other companies, which manufacture sanitary products, confirmed that the technology of Oerlikon Balzers is currently not an alternative to electroplating with hexavalent chromium. The field tests contradict the results mentioned by Oerlikon Balzers. In conclusion, industry has investigated the ePD technology in great detail. The results show that this technology is actually not a general alternative for several reasons. The wear resistance of ePD surfaces is not in line with current quality standards, while the production quality and production efficiency of ePD is very low. Furthermore, costumers complained about colour mismatch compared to electrodeposited chromium. Another issue that was observed is the accumulation of the visible lacquer thickness at the edges of 3 dimensional parts.

“ To the knowledge of OEMs, the Oerlikon Balzers technique is not approved for these chrome plated parts. The PVD technology itself requires a lot of attention on the quality of the finishing of the injection tools of the plastic parts. “

“Even Oerlikon Balzers has justified in their comments that additional time is required until “...the coating market in the EU could be (fully) covered in 6-7 years ...”.

“The statements given by the sanitary sector and automotive sector were also confirmed by companies operating in other sectors e.g. in the furniture sector. When testing ePD e.g. on columns with flexible heights for the use, e.g., in ergonomic desks, the abovementioned technical failures occurred after few height adjustments. Clearly, hardness, scratch resistance and abrasive behaviour was not in line with the requirements, as grooves and scratches were observed. The products also failed in a climate test: Infiltration through pores let to severe discoloration of the product. Furthermore, complex geometries cannot be coated satisfactory.”

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1146 Date: 2016/06/22	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					no alternative available		Comment 1146 Attachment .pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/ company: Drägerwerk AG & Co. KGaA Country: Germany							
Applicants' response:								
Drägerwerk AG & Co KGaA is involved in the medical sector and requires the surface modification provided by chromium-trioxide-based processes to implement the required surface characteristics of the medical products. Many of these characteristics benefit patient safety. The company has stated that it has already tested parallel technologies, but has been unable to find any alternative of equal standing. Drägerwerk AG & Co KGaA therefore relies on the services whose authorisation is being requested with the present dossier.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1143 Date: 2016/06/22 Type of comment :* The comment provides information that is generally in support of the	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/ company: <i>Confidential</i> Country: <i>Confidential</i>					In our experience, substitution of chromium trioxide is not possible as the requirements placed on our products from the medical technology sector are very high and the alternatives which have already been tested do not meet them. More detailed reasons are appended and can be read under point 2. 'Public version' attachment.		Comment 1143 Attachment .pdf

applicatio n								
Applicants' response:								
The commenting company is involved in the medical sector and requires the surface modification provided by chromium-trioxide-based processes to implement the required surface characteristics of the medical products. Many of these characteristics benefit patient safety. The company has stated that it has already tested parallel technologies, but has been unable to find any alternative of equal standing. It therefore relies on the services whose authorisation is being requested with the present dossier.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type e	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	
Ref.No: 1139 Date: 2016/06/22 Type of comment : The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Neumeister Hydraulik GmbH Country: Germany					Our company sees no alternative to the hard chromium plating which is described in the dossier at present. For more details, see the attachment Yours sincerely Neumeister Hydraulik GmbH ppa. J. Englert		Comment 1139 Attachment .docx
Applicants' response:								
The company Neumeister Hydraulik GmbH itself uses chromium-trioxide-based technologies for a variety of components that are manufactured for customers, but in addition also relies 2/3 on the services of other businesses. It states analogous considerations to those described in the AoA for the present dossier. According to the results from its own tests, it was not possible to find any parallel technology as an alternative to the requested use of chromium trioxide. It is important to point out in this context that a non-grant of authorisation would not only result in the loss of this corresponding production line with 7 employees – rather the entire production operation with 300 employees would be lost. This “lever” of surface technology is typical and particularly pronounced with the processes involving the use of chromium trioxide. Neumeister Hydraulik therefore shares the assessment of the dossier and supports the requested authorisation. The requested review period is viewed as a minimum – strategic corporate planning takes account of investments and a technical focus over an even greater period of time.								

The company Neumeister Hydraulik is testing, as a user, various possibilities for the adapted and widespread use of alternative technologies. It has extensive experience in this area and is therefore ideally placed to help to develop the assessment in relation to usage and ultimately implement it. The experiences outlined in the comment have been incorporated into the applicant's responses which are presented here. In particular the assessment of the process of HEF-Durferri (Ref. 1031) is substantiated by this.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1136 Date: 2016/06/22 Type of comment : The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: WAVEC GmbH Country: Germany					There are no alternatives for the cold rolling mill at the steel industry!!		Comment 1136 Attachment .pdf

Applicants' response:

The company WAVEC GmbH is involved primarily in the steel processing sector as a provider of services for surfaces. It details the reasons why no general alternative is possible in this sector. These are firstly the requirements of the customers and secondly negative effects on energy demand, CO₂ emissions and gas consumption figures. WAVEC is another example of the fact that dispensing with chromium trioxide would leave an entire further-processing industry without any suitable replacement. The steel-processing industry would have to leave Europe in order to remain internationally competitive.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	

Ref.No: 1131 Date: 2016/06/22 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: manroland sheetfed GmbH Country: Germany					Chromium trioxide is essential for the hard chromium plating, see point 2 and point 3.		Comment 1131 Attachment .docx
--	---	--	--	--	--	--	--	---

Applicants' response:

The company manroland is testing, as a user in the field of printing machines, various possibilities for the adapted and widespread use of alternative technologies. It has extensive experience in this area and is therefore ideally placed to help to develop the assessment in relation to usage and ultimately implement it. The experiences outlined in the comment have been incorporated into the applicant's responses which are presented here. In particular, it is apparent with the corrosion resistance that at the present time no alternative process is able to meet the necessary requirements.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1120 Date: 2016/06/22 Type of comment : * The comment	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: STI France Country: France					En remplaçant nos traitements actuels, nous ne pourrions plus satisfaire et répondre aux mêmes exigences et spécifications. Avec les technologies de substitution toutes les exigences techniques ne peuvent être couvertes que partiellement. En effet, le		Comment 1120 Attachment .docx

provides information that is generally in support of the application						remplacement total d'une solution par une autre n'existe pas.		
--	--	--	--	--	--	---	--	--

Applicants' response:

STI France cites diverse applications of solutions containing chromium trioxide for surfaces in the aerospace sector which are used to produce specific surface properties. In total every year, there are around 500 customers from different sectors and they are integrated in long-standing projects in the aviation industry (e.g. A320, A380 among others). The properties obtained from surface treatments containing chromium trioxide, as are requested for authorisation in the dossier, provide the basis for this. STI France details the consequences that a restriction on the availability and permission to use aqueous solutions containing chromium trioxide would have for the company. The existence of this successful company would be jeopardised, which would be all the more incomprehensible given that it complies with the strictest occupational safety conditions that currently apply in Europe. It should be remembered that the end products contain **no** Cr-VI – accordingly only the occupational safety conditions are relevant to the assessment of potential risk!

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1116 Date: 2016/06/22 Type of comment :*	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Non-governmental organisation (NGO) Name of org/company: ChemSec Country: Sweden					various alternatives		Comment 1116 Attachment .doc

Applicants' response:

Unfortunately, the commenter does not make any specific suggestions about alternatives in its comment. Instead, it demands a statement by the applicant on alternatives that were discussed in previous public consultations. The commenter has failed to recognise that this is a discussion of possible alternatives to the requested use of the SVHC in question – in our case chromium trioxide – and not any other conceivable one. Only specifically described technologies that enable the same use of the

application for authorisation with feasible technological and economic results are to be discussed at this point - or indeed their non-suitability. The commenter submits no information in this regard, which renders the comment useless.

However, as the commenter, from the applicant's perspective, is evidently pursuing other aims of a more political or populist nature with its comments, some of its assertions should be presented in the proper light so that the objective discussion is not technically hampered by incorrect information. The applicant is interested in a serious analysis of specific, meaningful and substantial comments.

The present comment does not meet these qualities, as the following statements will demonstrate:

1. The commenter claims the applicant has not even considered alternatives. However, the AoA running to almost 90 pages details what is publicly proposed as supposed alternatives and to what extent existing technologies are capable of meeting the actual requirements. This is in no way done by way of "assumptions" and "estimations", but rather is based on many years of experience with the requested uses. Specific approaches and criteria are devised and they make it possible to assess other technologies and therefore identify genuine alternatives. The commenter has evidently not looked at this or not looked at it properly, or it lacks the necessary insights into the actual technical and economic circumstances which need to be considered according to REACH.
2. The quotation cited in the comment (*"It is not useful to specify an alternative because the subsequent uses require the prepared solutions. ... It is also clear that it is pointless to look at alternative substances."*) does not come from the dossier which is being commented on here, but rather from another from HAPOC GmbH & Co KG that examines the formulation. The obvious assumption is that the commenter has got confused between different applications. The commenter's statements based on the interpretation of this sentence are therefore of no value to the present application.
3. Quotation: *"As the applicant is "not considering specific products, articles or their applications" it is not possible to match safer alternatives against them as required in REACH."*

The REACH regulation demands that the use of the substance which is identified as a SVHC is addressed. In the present case, this is chromium trioxide. However, the products or articles whose surfaces are modified by the use of chromium trioxide in accordance with the present dossier are free of chromium trioxide!

- a.) Consequently, it is not necessary to look at the article or similar product as there is no risk here. In particular, the target group of the dossiers cannot – as is outlined in detail – carry out any appraisal of alternatives in relation to specific articles or products as the corresponding components are constantly changing and also cannot be predicted. The dossier contains detailed representations in this regard which the commenter ought to have been aware of if it had read the dossiers.
 - b.) The requested use does not relate to the specific components – whose subsequent place of deployment is often not known to the user of the chromium trioxide. Rather, the requested use generates specific surface properties on various base materials. An alternative consideration is needed here and this was carried out in detail in the analysis of the alternatives. If the commenter had read the dossier and looked at its contents, it would not have missed this connection. It is seemingly not familiar in particular with the service nature, which is discussed in detail in the dossier, of the target group of users of the present dossier.
4. The commenter demands that all alleged alternatives and alternative processes from previous applications must be looked at. The following points should be made here:

- a.) The present dossiers were compiled **before** comparable dossiers were discussed in the public consultation. The commenter is evidently not familiar with the processes of the authorisation procedure.
 - b.) Alternatives are only alternatives if they have demonstrated their suitability. Until this happens, they are merely technologies that exist in parallel with their own characteristic profile. The commenter's evident wishful thinking that any reference to another technology opened up the path to an alternative is technically unfounded and incomprehensible. It therefore cannot serve as the basis for a well-founded analysis of the content.
 - c.) The analysis of the alternatives of the present dossier focuses intensively on the possibilities presented by other technologies. It compares the properties and uses of the chromium-trioxide-based technologies with them. However, this is based on fundamental examinations of these technologies and not on every new "brand" which is to be highlighted by marketing activities. As has already been stated above, the commenter possibly lacks the necessary technical insight and experience to be able to assess similar technologies or "brands" as a whole. However, the applicant does not feel obliged to compensate for this possible deficiency.
 - d.) As can be recorded, the "alternatives" which were addressed by the commenter were dealt with in detail in the previous, comparable dossiers and commented on by the applicants and downstream users therein. Both applicants, users (downstream users) and customers of the users unanimously come to the conclusion that no alternative exists which does not already have its own market share. Additional substitutions are identified as being technically and economically unfeasible. The commenter should take note of this result even though it may not be the outcome it wants. A repeat of this discussion will not lead to a different outcome – especially as the commenter makes no contribution, or is unable to make any contribution, to the technical and economic background. At this point, the applicant therefore also has no possible way of responding further to the unspecific statements made by the commenter.
5. The commenter claims the application is based exclusively on assumptions that the risk to employees and residents could be neither calculated nor assessed. However, in part 1, CSR, the dossier includes tables of real measured exposure values for numerous businesses that actually exist. These values are presented using official dose-response relationships for the purpose of risk assessment and appraisal. Likewise, a presentation based on a spreadsheet was also submitted and this enables every single value of the applicant's assumptions to be reviewed and assessed.
6. The demand to disclose the businesses in which these measurements were carried out must be regarded as inadmissible. As an actor above the supply chain, there is no obligation from the REACH Regulation to disclose any business-specific data about downstream users! As is noted in the dossier, the corresponding measurement reports exist and can be made available to the decision-making authorities if necessary. However, they do not reveal any new findings because the authorities ought to have been aware of the real measured exposure levels for some time – the Attachment XV document for chromium trioxide makes reference to this!

Quotation from the comment: *"The applicant should specify the locations and sizes of facilities, the number of workers exposed to allow a sufficient assessment."*

- a.) By making this demand, the commenter places itself above possible data protection concerns of the businesses involved and possibly regards itself as an additional supervisory authority. We are not aware of such a transfer of sovereign rights to the commenter. In addition to the chemical regulations, there are other property rights that the commenter evidently does not

wish to observe any further here. As the party involved, the applicant had to pursue a lawsuit over many years to obtain a corresponding official insight into the official exposure level data.

- b.) The user of an authorisation must consider the risk in its own company. The totality of all companies does not have the capacity or is not required to form the basis for the risk assessment. It ought to be clear to the commenter itself that in this way the worthiness of protection of the individual would depend on the (changing) number of utilising businesses in Europe.
- c.) If the authorisation is granted, the dossier may serve as a basis for use for any number of the applicant's customers. The REACH Regulation explicitly leaves this open. The "primary" authorisation which is explicitly made possible by REACH does **not** demand
 - that anybody can gain an insight into any company,
 - that the users of the authorisation must be stipulated from the outset and thus monopolies are defined by the regulation. Preventing monopolies is an essential prerequisite for the working of the internal market – another aim of REACH.
- d.) The applicant offers in the dossier to independently limit the overall risk by reviewing the level of exposure of customers and comparing this against a maximum exposure level. If this level were exceeded, no deliveries would take place. This self-regulation already goes way beyond the requirements of the REACH Regulation and covers all future companies that want to and will make use of the authorisation which is to be granted. The commenter has overlooked this passage.

General comments:

It is not clear to the applicant what information it should take from the comment. The comment gives the impression that the commenting organisation has not seriously examined the material and has only read certain points in the present dossier and is therefore only able to assess its content to a limited extent.

Rather, it is evidently using the technically oriented tool of the "public consultation" for its own political point-scoring.

Quotation:

"The aim of REACH is to improve the protection of human health and the environment from the risks that can be posed by chemicals. Chromium Trioxide is long known for its hazardous properties. That the chemical is getting regulated and finally banned should have been noted by companies at latest when it was listed on the REACH candidate and authorization list. The arriving sunset date has initiated an innovative process with new companies developing new alternatives and processes. This preferable process, which creates jobs and eliminates pollution and health effects is disturbed or even halted, when granting authorization for future use. Instead of improving the protection of human health and the environment the authorization for such a broad scope would create new pollution and health costs society has to bear."

Political convictions, own goals and world views are conveyed here, but there is no robust or useful content in relation to technical alternatives. As the purpose of the comment is not apparent, this makes it much harder to come up with real solutions and findings. The applicant shall therefore refrain from responding to the commenter's political, seemingly polemic, but unsubstantiated assertions and expressions of opinion in the paragraph quoted above.

Reference to the available responses from previous consultations:

(Bosch, Grohe, Kromatek)

What can be inferred from all responses is that the applicants are missing specific details. The comments are regarded as being not very helpful for the purpose of practical assessment. In particular, the assessment of the alternatives is regarded as being too sweeping.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:111 Date: 2016/06/22 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: HARTCHROM-beck GmbH. Country: Germany					Our experience tells us that substitution of the chromium trioxide is not possible! In our experience, substitution of the chromium trioxide is not possible!		Comment 1111 Attachment .pdf
Applicants' response: The company Hartchrom Beck is evidently involved in numerous supply chains which are dependent on the results of the uses of solutions containing chromium trioxide for surface modification. In addition, it is by its own admission a user of solutions which contain chromium trioxide itself and offers its know-how on use as a service in the market. The availability of solutions containing chromium trioxide is therefore a prerequisite for the continued existence of the company, which by its own admission is more than 90% dependent on this service for other industries. The company sees no possibility of an alternative even though it has maintained its position in the market for 50 years in competition with rival technologies. If authorisation is not granted, the company would have to stop offering its service, close and shed 22 jobs. This situation along with the low real risk of the requested use mean that even an authorisation with a short term of less than 12 years seems disproportionate.								
	Submitter:	Alternative:						Attachments:

Reference number and date:		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1105 Date: 2016/06/22 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Helmut Gossmann Metallveredelungs GmbH Country: Germany					Our company is currently not aware of any alternative that would result in the required properties.		Comment 1105 Attachment .docx
Applicants' response:								
<p>The company Gossmann Metallveredelung is evidently involved in numerous supply chains which are dependent on the results of the uses of solutions containing chromium trioxide for surface modification. In addition, it is evidently a user of solutions which contain chromium trioxide itself and offers its know-how on use as a service in the market. The availability of chromium-trioxide-based technologies is therefore a prerequisite for the continued existence of the company, which by its own admission is more than 80% dependent on this service for other industries. Without valid authorisation, the company would have to cease its production.</p> <p>As by the company's own admission no negative health effects have been observed during the course of its existence, a failure to grant the authorisation would be incomprehensible. Even a grant with a short review period seems disproportionate in comparison with the existence of companies and jobs.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1101	Affiliation: BehalfOfACompany					there is no reliable alternative to functional		Comment 1101 Attachment .doc

Date: 2016/06/22 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/ company: Confidential Country: Confidential					chrome plating or our application			
Applicants' response: <p>The commenting company is a provider of services for surfaces and in doing so uses aqueous solutions containing chromium trioxide, as described in the dossier. By its own admission,</p> <ul style="list-style-type: none"> - to provide its service the company requires the natural properties of surfaces that can be adjusted using solutions containing chromium trioxide, - the company has, as part of the continuous improvement process, tested a range of parallel technologies, none of which was able to prove itself as a viable alternative, - the company is constantly competing with rivals from outside Europe which, if the authorisation is not granted, would take over the market shares in spite of currently offering an inferior level of performance – with the same technologies being used that would not be authorised in Europe, - the company's existence depends entirely on offering the service with chromium-trioxide-based surface modifications, so it would have to close if the authorisation is not granted; this would logically bring with it negative consequences for the considerably larger customer sectors – such as machinery and plant manufacturers; this could extend as far as a relocation of production operations to other countries outside Europe. <p>With this in mind, a refusal to grant the authorisation or a grant with a short term (less than the requested terms) seem disproportionate.</p>									
Reference number and date:	Submitter:	Alternative:						Attachments:	
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling		

Ref.No:1 098 Date: 2016/06/ 22 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Industry or trade association Name of org/company: BDSV e.V. Country: Germany					BDSV confirms that the authorisation of Chromium trioxide is of vital interest to our member companies. Surface treatment with chromium trioxide is needed for many components of various defence products. To date, no suitable alternatives have been identified. Thus BDSV supports the authorisation for the period specified in the application of HAPOC.		Comment 1098 Attachment .pdf
--	---	--	--	--	--	--	--	--

Applicants' response:

The German Federation of Security and Defence Industries (BDSV) describes in general how the requested uses of chromium trioxide and its aqueous solutions are an essential component in many multinational supply chains in the security industry. Nevertheless, according to the BDSV, in quantitative terms the security industry is only a minor customer for the service providers in the surface industry. An "individual exception" for security and defence projects is therefore ruled out because the contracting companies could not exist on this alone.

If the requested authorisations are not granted or are granted without a sufficient review period, the BDSV thinks that numerous security and defence projects and supply chains will be jeopardised. At the very least, large elements would migrate to other countries outside Europe, which would be unacceptable for the defence and security of Europe.

The BDSV further points out that the defence industry has been looking for a replacement for surface modifications using chromium-trioxide-based systems and technologies for many years – in most cases without any success. In this sector in particular, exclusively technical defects were probably the factor that tipped the scales.

The comment by the BDSV confirms the meaningfulness of the definition of use in the present dossier. The use is not to be related to individual products but rather to the creation of necessary surface properties on any products/components for any sectors.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1 094	Affiliation: BehalfOfACompany					Parallel or alternative technologies can only cover		Comment 1094 Attachment .pdf

Date: 2016/06/22 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/company: STI Deutschland GmbH Country: Germany					partial aspects of hard chrome's property profile. Replacing the wide scope of hard chrome's property profile is only partially possible, even by combining several technologies.		
Applicants' response:								
<p>STI Deutschland gleans its experiences from 100 years of surface technology. Although alternatives to chromium-trioxide-based surface processing have always emerged as competition in the market, the search for possible alternatives again increased with the market uncertainties resulting from REACH. The typically competing technologies are assessed, including plasma nitriding (see in this regard also the comments 1029, 1030, 1031 by HEF-Durferri), PVD (see comment 1149 by Oerlikon-Balzers), thermal spraying, laser deposition welding, hard chromium plating with Cr-II-based electrolytes (see in this regard comments 1161, 1162 by the company Savroc, although a pure chromium layer is not described) as well as surface finishes based on other metals. As a result, none of the other technologies achieves the technical properties of the chromium-trioxide-based surface modifications or they likewise use substances with SVHC properties.</p> <p>STI reports on regular medical check-ups for the workforce without any negative anomalies. The prerequisite for this is that the usual personal protective equipment is worn. STI takes this as a clear indication that the safeguards which were introduced many years ago and have been constantly improved ever since offer effective and reliable protection.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1091 Date: 2016/06/22 Type of comment	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company:					Based on our many years' experience in the surface coating of sleeves, cylinders and embossing rollers, we are not aware of any substance or technical alternative to chromium		Comment 1091 Attachment .pdf

<p>:* The comment provides information that is generally in support of the application</p>	<p>Saueressig GmbH + Co KG Country: Germany</p>					<p>trioxide/hard chromium plating which meet all of the required technical demands in one process.</p>		
<p>Applicants' response:</p> <p>The Saueressig GmbH & Co KG group of companies is able to draw on the experiences of five different companies from three EU member states. Agreement with the contents and assessments of the dossier which is commented on is found right across the group of companies. In particular, a rejection of the application for authorisation or a curtailed review period is considered to be disproportionate. The reasons for this are the massive economic repercussions without the group of companies expecting any health improvements as no negative consequences for the health of the workforce have so far been observed. Here too, the numerous investments in employee and environmental protection have obviously hitherto reliably prevented any deleterious effects from the use of chromium-trioxide-based technologies.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
<p>Ref.No:1087 Date: 2016/06/21 Type of comment : * The comment provides information that is generally in support of the</p>	<p>Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Servitec GmbH Country: Germany</p>					<p>Owing to our many years' experience of using mixing rollers which are hard chromium-plated (with chromium trioxide) and the requirements of our customers, we see no alternative.</p>		<p>Comment 1087 Attachment .docx</p>

applicatio n								
Applicants' response:								
As an SME, this company confirms the lack of any alternatives to the chromium-trioxide-based surface finishes. It is involved in many sectors and states that the requirements of its customers can only be met by uses, such as the one that is applied for here.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	
Ref.No: 1 083 Date: 2016/06/ 21 Type of comment :* The comment provides informatio n that is generally in support of the applicatio n	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: LKS Kronenberger GmbH Metallveredlungswerk Country: Germany					No technically and economically suitable alternatives to the uses requested in the application for authorisation exist; reasons will be set out in detail. Explanation is given as to why LKS Kronenberger GmbH is existentially reliant on the further use extending beyond the sunset date.		Comment 1083 Attachment .docx
Applicants' response:								
LKS Kronenberger GmbH presents a comprehensive analysis of the situation surrounding the use of aqueous solutions containing chromium trioxide for surface modification. The intention is not to repeat it here – but the applicant recommends an in-depth examination of the findings and presentation of real circumstances in a service company in the surface technology industry. From its own specific experiences, LKS Kronenberger comes to the same conclusions as the present dossier with a request for authorisation. In particular, the company sees no technically or economically feasible alternative for itself as a service provider and for its customers, but rather identifies the continued availability of the use from the application as being the basis for its own continued existence.								
Referenc e number	Submitter:	Alternative:						Attachments:
		Type	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	

and date:								
Ref.No:1078 Date: 2016/06/21 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Confidential Country: Confidential					From a current perspective, we see no alternative to hard chromium - please consult the attachment for more details.		Comment 1078 Attachment .pdf
Applicants' response: The commenting company is, as a customer of the service providers in the surface technology industry, involved in a specific sector in which particular requirements are placed on its components. As is stated, an attempt was made to identify possible substitution options particularly due to the current discussion surrounding chromium trioxide. However, none of the parallel technologies that are currently known and under discussion was able to deliver all of the necessary properties. This comment also shows the universal suitability of the chromium-trioxide-based processes due to the large number of positive properties of the resulting surfaces. If the use should shortly no longer be available, the commenting company expects considerable disadvantages. It considers this to be disproportionate as in its view the massive disadvantages are not offset by any measurable potential for improvement in the area of health protection and environmental protection. This company also considers the requested review periods to be a minimum with regard to product life cycles and planning certainty.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1073 Date: 2016/06/21	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					Currently, in major worldwide industrial automotive markets, such as North America, Europe, Japan, Korea, Southeast		Comment 1073 Attachment .pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/company: Teikuro Corporation Country: United States					Asia, China, and the United Kingdom, the preferred coating process for the automotive press dies has been and still remains to be hard chrome.		
Applicants' response: The company Teikuro states that it repeatedly has to compete in the global market, namely with the parallel technology of PPD. By its own admission, it has repeatedly been demonstrated that the chromium-trioxide-based surface processes are the only method of choice for the applications of the components. There is a detailed specification of which factors cannot be achieved by the parallel technology(ies). As one of the many customers from the numerous supply chains in which the requested use is embedded, Teikuro confirms the extent to which this technology is relied upon across industry. Along with the non-observable actual risk of use, Teikuro's plea not to restrict this use and therefore the entire supply chains in a disproportionate way, or even render them entirely impossible, is understandable.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1070 Date: 2016/06/21 Type of comment :* The comment provides information that is generally	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Metallisierwerk Peter Schreiber GmbH Country: Germany					Our experience of over more than 90 years in the field of surface technology has led us to conclude that substitution of the chromium trioxide is not possible. The technical layer properties from chromium plating for components, machinery or for the end product produced with it are essential and indispensable.		Comment 1070 Attachment .docx

in support of the application								
Applicants' response:								
Metallisierwerk Peter Schreiber GmbH has been involved in the service sector for 90 years. It caters for the target group for which the present dossier requests authorisation. Over these 90 years, the company has certainly repeatedly come across technologies that exist in parallel. It can be assumed that other technologies which were better able to produce the required surface properties for specific components have repeatedly been selected in the market. However, the fact that the service offered by the company Schreiber has endured over such a long period of time shows that the properties of the chromium-plated surface cannot generally be replaced by another technology.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1066 Date: 2016/06/21 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Heyer GmbH Oberflächentechnik Country: Germany					In our experience, substitution of chromium trioxide is not possible as there is currently no chromium-trioxide-free alternative allowing a coating of equivalent quality to be produced.		Comment 1066 Attachment .docx
Applicants' response:								
The company Heyer confirms the assessments of the present dossier as a service provider and user of aqueous solutions containing chromium trioxide for surface modification. Primarily there is confirmation that the use is not a product-related use but rather a requirement-related use. As the company is also unaware of any 1:1 alternative for all of its end customers and future components, a ban on use would be tantamount to the loss of its own production capability and probably the entire company. Due to the particular sectors in which Heyer operates as a service company,								

the requested review periods are also viewed as a minimum to allow companies and customers to plan with a sufficient degree of certainty and thus safeguard their continued existence.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1063 Date: 2016/06/21 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Dr. Schneider Kunststoffwerke GmbH Country: Germany					No substance available to substitute CR6 on a short or mid term Basis. To secure our supply chain to our customers (OEM) with long term agreements we need this substance.		Comment 1063 Attachment .pdf
Applicants' response:								
The company Dr. Schneider Kunststoffe is a globally sought-after supplier and development partner that manufactures for well-known automotive manufacturers. The company is constantly in contact with its customers in order to assess modified coating processes. There is currently no sign of any process that is able to replace chromium plating from Cr(VI) electrolytes and safeguards the long-term supply capability that is required. An assessment of the life cycle of a model of a car as being 27 years is noteworthy. Over this period of time, the parties involved in the supply chain need to be able to reliably access the respective suppliers, so also the surface technology service providers.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1060	Affiliation: BehalfOfACompany					We currently see no alternative to the chromium plating, as described in the		Comment 1060 Attachment .pdf

Date: 2016/06/21 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/company: Hartchrom GmbH Country: Germany					dossier to be commented upon. Please see the attachment for the details of our reasons.		
Applicants' response: The commenting company emphasises that 50% of its sales are generated by non-foreseeable services that are provided at short notice. Supply chains, customers and components are constantly changing here. General alternative technologies are therefore difficult to define. Nevertheless, the company has devoted considerable effort to this and also found alternatives in some areas. In other areas – in particular with the requested use – there are no technically and economically feasible alternatives. In addition, the investigations highlighted future component prices which would not be at all acceptable in the market. The company assesses the loss of chromium-trioxide-based production by the non-granting of authorisation to be a serious risk to its own existence as 70% of its sales are based on this.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1057 Date: 2016/06/21 Type of comment :* The comment provides	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Industry or trade association Name of org/company: <i>Confidential</i> Country:					advice to the alternatives.		Comment 1057 Attachment.docx

information that is generally in support of the application	Confidential							
Applicants' response:								
The commenter states in detail the need for the continued use of chromium-trioxide-based surface technologies. Its assessments for the industrial sector that it represents are in line with those in the present dossier.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1053 Date: 2016/06/21 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: MAN Diesel & Turbo Country: Germany					Avoiding chromium plating on piston rings and optimization of lubrication oil supply to the piston ring land for improving tribological effects as alternative to chromium plated piston rings could not be applied as technological standard to the series.		Comment 1053 Attachment .pdf
Applicants' response:								
The commenting company makes use of the service of companies that belong to the target group of the application which is commented on. Based on its specific requirements, it is demonstrated that no technically feasible alternative exists.								
	Submitter:	Alternative:						Attachments:

Reference number and date:		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1049 Date: 2016/06/20 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Industry or trade association Name of org/company: ZVO - Zentralverband Oberflächentechnik / Federal Association of Surface Treatment Country: Germany					General Comment		Comment 1049 Attachment .pdf
Applicants' response: The commenting Association for Surface Treatment (ZVO) in Germany states in detail and with professional expertise the need for the continued use of chromium-trioxide-based surface technologies. The target group of the present application is part of the sector that the ZVO represents. The ZVO can therefore be regarded as an expert association for utilisation of the requested use. Its assessments are based on broad knowledge of the service providers and their customer sectors.								
Reference number and date:	Submitter:	Alternative:					Attachments:	
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1045 Date: 2016/06/20	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					As things stand today and based on our many years of experience, substitution of chromium trioxide is not feasible because the substitute coatings		Comment 1045 Attachment .docx

Type of comment :* The comment provides information that is generally in support of the application	Name of org/ company: <i>Confidential</i> Country: <i>Confidential</i>					currently available do not meet the required complex properties of the hard chrome layers we offer.		
Applicants' response: The commenter evidently applies the requested use itself. For more than 50 years, the company has also constantly competed with parallel technologies to the requested use. However, it maintains its market share simply because no suitable technically and economically feasible alternatives exist. 95% of total sales depend on the requested use – a lack of authorisation would be tantamount to the loss of the company; the service would then also be lost for all supply chains in which the company is active.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1041 Date: 2016/06/20 Type of comment :* The comment provides information that is generally in support of the	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/ company: Interprecise Donath GmbH Country: Germany					In our opinion, substitution of the hard chrome layer is not possible for our products. See annex for justification.		Comment 1041 Attachment .pdf

applicatio n								
Applicants' response:								
The commenting company Interprecise Donath GmbH states, as a customer of the surface industry, in detail and with professional expertise, citing examples and its own practical experiences, the need for the continued use of chromium-trioxide-based surface technologies. Experiences with a range of parallel technologies for the finished assemblies for textile machinery and rolling bearings are set out. A technically and economically feasible alternative could not be found.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type e	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	
Ref.No: 1 037 Date: 2016/06/ 20 Type of comment :* The comment provides informatio n that is generally in support of the applicatio n	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: <i>Confidential</i> Country: <i>Confidential</i>					We see no alternative as our own search for substitute materials has been unsuccessful so far.		Comment 1037 Attachment .doc
Applicants' response:								
As a service provider in the surface technology sector, the commenting company fully matches the target group for the present application. It confirms the statements made in the application. As since the company was founded more than 60 years ago no negative effect has been seen from the requested use, a failure to grant and also a reduction in the requested review period is viewed as disproportionate.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type e	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	

Ref.No: 1029 Date: 2016/06/20 Type of comment : * The comment provides information that is generally not in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: HEF-DURFERRIT Country: France					Alternatives exist to replace Hard Chromium (Chromium trioxide) processes on a high proportion of parts who are currently Hard Chromium plated. Nitrocarburizing is one alternative. It offers technical improvement (corrosion resistance, wear resistance, surface flaking resistance...) and cost advantages.	Comment 1029 Attachment .pdf
--	---	--	--	--	--	---	--

Applicants' response:

1. Reference to the discussion in the dossier:

The applicant makes reference in relation to assessing the method presented to the discussion in the submitted dossier (p. 62). The discussion points presented there are unfortunately not picked up by the commenter:

Alternative for: functional chromium plating

Using elevated temperatures and the addition of reactive gases, reactions are initiated between the base material and the gases. The coatings show increased roughness and low dimensional precision.

Tests performed by users from VECCO give the following results:

- After nitriding, the users surveyed (members of VECCO e.V.) detected a greatly reduced level of shine and high discolouration.
- The surface hardness was not significantly increased.
- A reduction in corrosion protection was detected.
- As a result of high thermal distortion, a precision coating was not possible.
- Adequate corrosion protection can only be achieved if the base material (steel) already contains at least 13% Cr.

Risk assessment

- Not known

Outlook

- User tests show that this process is unsuitable.

Based on these results, several end customers have transitioned to precision chromium plating.

- The process is technically unsuitable as an alternative.

2. Responses / remarks in relation to the comments

a. Classification of the process by the commenter:

In the general presentation, the commenter refers to its process as

„Alternatives exist to replace Hard Chromium (Chromium trioxide) processes on a high proportion of parts who are currently Hard Chromium plated. Nitrocarburizing is one alternative. It offers technical improvement (corrosion resistance, wear resistance, surface flaking resistance...) and cost advantages.”

In the full comment (background dossier), this statement is qualified to the extent that the process is set out as **one** conceivable alternative which could be applied under specific circumstances:

*“Alternatives exist to replace Hard Chromium (Chromium trioxide) processes on a high proportion of parts who are currently Hard Chromium plated (Functional Chromium Plating). Nitrocarburizing is **one alternative** offering in the meantime technical improvement (corrosion resistance, wear resistance, surface flaking resistance...) and cost advantages.”*

This statement can be confirmed by the applicant to the extent that the process which is presented can be and already is used successfully for certain products. The essential limitation is insufficient dimensional accuracy and insufficient corrosion resistance (see point outlined above).

b. Assessments from the literature very much see the benefits of the process, but also note that it has not become established (e.g. H.-G. Burkart (Hydrosaar GmbH, Sulzbach): Piston Rod Coating – Processes, Quality Assessment & Trends; Industry Colloquium of the IFAS-RWTH Aachen, 16.09.2011)

“For piston rods used in applications that favour corrosion, essentially the types of coating which are listed in Table 1 are used (....). Thin-film processes, such as gas nitrocarburising, plasma nitrocarburising, and PVD (Physical Vapour Deposition), a special gas-phase coating process, have not been able to establish themselves.”

Based on the research that has been carried out and discussions that have been held, the applicant is of the view that the reason for this is that, when the processes are presented, the improved properties are emphasised. The disadvantages in other parameters only become apparent in field trials or under application conditions. However, the whole package must be used as the basis for making a decision. The result of this in practice is that processes are also removed from the market again.

c. At this point, the applicant would also like to refer to the comments that have been received

- Comment of Neumeister Hydraulik (Ref. 1141):

"Most of our cylinders are used in mobile hydraulics. The properties of hardness and corrosion resistance are required here. In particular, salt and stone chippings are a problem for the coatings. In addition, our customers demand a long service life and resistance to chemicals." ... The processes of nitrocarburising plus oxidation or plasma nitriding plus oxidation were also tested, but they do not meet the requirement for corrosion resistance that is demanded in the automotive sector."

- Comment of STI (Ref: 1000, 1096)

"Plasma nitriding

- *For most applications, the function is only provided by the thin connecting layer (white layer).*
- *Wear on this results in tribological deterioration and anti-adhesion*
- *Actual corrosion protection is only provided in a lubricated system*
- *Hardness, hardness penetration depth and hardness profile are primarily dependent on the base material and are not properties of the layer.*
- *Warping resulting from high thermal stress severely limits the possible applications"*

3. Reference to previous applications (here CTAC):

Here too the applicant would like to refer to the comments made by the CTAC:

"These recent test results show that nitro carburizing is far from providing a substitute for hard chrome plating in the automotive industry, as well as in automotive tooling. Even in the current day, further improvements in engine technology, downsizing and further decrease in fuel consumption exclude forms of nitrocarburised parts and require the use of more hard chrome plated parts. The use of the techniques in austenitic steel leads to decreased corrosion resistance e.g. on engine valves and cannot replace hard chrome plating. The assessment of nitrocarburised parts on component test benches demonstrated that the parts clearly failed due to insufficient flexural rigidity resulting in cracks. Consequently, no further testing was performed."

"In summary, the proposed technology has been well known to the industry for decades and can be used for limited applications where the performance requirements are comparably low. In this regard, it is not possible to define or exclude specific applications from the authorisation as no specific part is affected. According to the available data, as presented in this AfA, it is clear that nitrocarburising can by no means be considered as a general alternative for key applications within the automotive or other sectors. "

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No:1026 Date: 2016/06/20	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					There is no technical alternative that could be used by our company. Buying- out of EU is impossible if Chromtrioxid		Comment 1026 Attachment .pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/company: <i>Confidential</i> Country: <i>Confidential</i>					will not be authorized it will not be possible for small or medium sized business (KMU) to continue the delivery of such products.		
Applicants' response:								
For its own deliveries in the automotive sector, the commenting company requires possibilities for procuring galvanised plastic parts within Europe. The plans for longer-term product lines are currently being hampered by the uncertainty surrounding future authorisations. Competition from outside Europe is benefiting from this. If the authorisations should not be available in the future – with sufficient review periods – the company will probably lose further shares of the market to non-EU companies. The company regards this possibility as being disproportionate in view of the high safety standard that currently exists for its service providers that carry out the requested use.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1024 Date: 2016/06/20 Type of comment :* The comment provides information that is generally in support	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Industry or trade association Name of org/company: European Committee for Surface Treatment (CETS) Country: Germany					There is no general alternative available for companies concerned by the applications referred to.		Comment 1024 Attachment .pdf

of the application								
Applicants' response:								
<p>The European Committee for Surface Treatment (CETS) comprises numerous national federations of the member states of the EU. Its clientele primarily includes SMEs in the surface industry, in particular the target group of the present application. As the committee associates itself fully with the statements made in the dossier, the applicant feels vindicated. The extensive investments made in occupational safety and environmental protection over many years have managed to generate a high level of safety. Negative effects on health from the requested use can no longer be found in such businesses. As it is aware of the existential threat to the SMEs in the surface technology sector, the CETS also regards a failure to grant the authorisation or a shortening of the requested review periods as unreasonable and disproportionate. Across Europe, all investment measures supervised by the authorities to minimise the risk would be declared ineffective and superfluous.</p> <p>When asked, the committee stated that its comment was submitted for the dossiers 0064-02, 0064-03 and 0064-04. Inexplicably, it was only referred to in 0064-02.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1021 Date: 2016/06/20 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: ANDRITZ Fiedler GmbH Country: Germany					The alternative coating technologies do not replace the current hard chrome layer. The alternative coatings do not show the same performance in terms of wear resistance and surface quality.		Comment 1021 Attachment .pdf
Applicants' response:								
The commenting company has a leading position in the global market for paper and pulp. It describes in detail the surface properties that its products require. Accordingly, a range of different surface treatments were tested, but they could not meet the requirements. The applicant is								

aware that the special properties of paper and pulp place high requirements on the surfaces. Chromium-trioxide-based processes can only be substituted with technologies of significantly inferior quality. The competitiveness of the businesses inside the EU would therefore be dramatically reduced if the use is lost or the review period is too short.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1018 Date: 2016/06/20 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Windmüller & Hölscher Country: Germany					Chromium trioxide is essential for galvanic chromium plating in order to improve the properties of machine components in terms of slippage, anti-adhesion, corrosion protection, wear resistance and chemical resistance. Other coatings are inferior and lead to extra costs.		Comment 1018 Attachment .doc

Applicants' response:

The commenting company makes use of service companies in the surface industry to finish its mechanical products. The requested use plays a central role here. Alternative surface treatments were again nowhere near able to reproduce the required properties.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1013 Date: 2016/06/20	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					Substitution of chromium trioxide is not currently possible as there is no single alternative/method that meets all the		Comment 1013 Attachment .pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/company: Henkel Beiz- und Elektropolier technik Betriebs GmbH Country: Austria					necessary quality criteria of our customers.		
Applicants' response: The comment presented here clearly demonstrates how closely linked the applications of the requested use referred to in the dossier are. In each of the stated applications, alternatives have repeatedly been tested over many years, but in most cases the required properties were missing. The requested use therefore remains the central process that can only be substituted without any drawbacks in specific individual cases. The service provider therefore has a special legitimacy. If the authorisation is not granted or there are shortened review periods, not just the surface finishing sector but numerous other sectors would also be significantly affected, and it is not possible to foresee all of the technical and economic consequences. The level of complexity is high; reciprocal effects are wide-ranging.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1010 Date: 2016/06/20 Type of comment :* The comment provides information that is generally	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: GTW Galvanotechnik Werl GmbH Country: Germany					Substitution of chromium trioxide is not possible as the necessary requirements cannot be achieved with alternative processes.		Comment 1010 Attachment .docx

in support of the application								
Applicants' response:								
The commenting company GTW Galvanotechnik Werl GmbH states, as a customer of the surface industry, in detail and with professional expertise, citing examples and its own practical experiences, the need for the continued use of chromium-trioxide-based surface technologies. The lack of alternatives is underlined.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 1006 Date: 2016/06/20 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: manroland web systems GmbH Country: Germany					thermal spray processes, nickel plating, nickel-dispersion plating, electroless nickel plating		Comment 1006 Attachment .pdf
Applicants' response:								
The commenting company manroland web systems GmbH states, as a globally operating customer of the surface industry, with professional expertise citing its own experiences, the need for the continued use of chromium-trioxide-based surface technologies. It emphasises the lack of alternatives and the economic risks of non-granted authorisations or shortened review periods. This is alarming in particular for globally operating companies as customers of the service businesses.								
	Submitter:	Alternative:						Attachments:

Reference number and date:		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 998 Date: 2016/06/17 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: STI Group Country: Switzerland					Chrome plating out of trivalent chromium electrolyte; thermal spray processes, nickel plating, nickel alloy plating, nickel-dispersion plating, electroless nickel plating, PVD (CrN and DLC), plasma nitriding, gas nitriding, explosion cladding, magnetron sputtering, nano Cobalt Phosphor plating.		Comment 998 Attachment.pdf
Applicants' response: The commenting STI Group from Switzerland, which likewise operates in the EU area, states in detail and with professional expertise, citing examples and its own practical experiences, the need for the continued use of chromium-trioxide-based surface technologies. The necessary prerequisite for this is the availability of suitable aqueous solutions. The company continuously tests the possibilities of applying different processes. But the comment shows that this is only possible to a limited extent. In the present consultation, the results of the company support in particular the assessment of the comments of HEF-Durferriet (Ref. 1031) and Oerlikon-Balzers (Ref. 1149). Furthermore, the results in relation to the use of chemical nickel plating indicate the limits that are vital for assessing the process presented by the company Savroc (Ref. 1160).								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 992	Affiliation: BehalfOfACompany					As Heidelberger Druckmaschinen AG we see no alternative to chromium		Comment 992 Attachment.pdf

Date: 2016/06/17 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/company: Heidelberger Druckmaschinen AG Country: Germany					trioxide. None of the known technical alternatives fully meets the requirements that are currently met by a hard chromium coating on the components.		
Applicants' response:								
Heidelberger Druck is well known as a globally operating company that has a dominant position in the market. It is in constant competition and therefore has in-depth knowledge about the suitability of other technologies compared to the requested one. In this industrial sector too, there is evidently no technically and economically feasible alternative to the requested use.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 989 Date: 2016/06/17 Type of comment :* The comment provides information that is generally	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Gedore Werkzeugfabrik GmbH & Co. KG Country: Germany					GEDORE is a global tool-making company headquartered in western Germany. Banning the use of Chromium Trioxide or substitution by numerous technologies used in parallel would lead to dramatic consequences for our enterprise.		Comment 989 Attachment.pdf

in support of the application								
Applicants' response:								
Gedore represents another sector that is reliant on the service provided by the surface coating businesses that use chromium trioxide. There is no apparent alternative. Without authorisation or with shortened review periods, a customer enterprise would face major existential problems here too.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 986 Date: 2016/06/17 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Liebherr Components Kirchdorf GmbH Country: Germany					The use of chromium trioxide for functional chrome plating (hot and hard chrome plating and coating systems) is of vital importance for Liebherr. Experience with alternative coatings has shown that no equivalent substitute can be achieved for coatings containing chromium trioxide (hot chrome, hard chrome) for hydraulic cylinders.		Comment 986 Attachment.pdf
Applicants' response:								
The company Liebherr Components manufactures hydraulic cylinders. The use of chromium trioxide for functional chrome plating (hot and hard chrome plating and coating systems) is of vital importance for this. Experience with alternative coatings, such as NIL35, nitriding and spray coatings has shown that no equivalent substitute can be achieved for coatings containing chromium trioxide (hot chrome, hard chrome). Alternatives are in some cases extremely delicate, sensitive with regard to seals, limited by the choice of materials or component size and are frequently not economically viable from a cost/benefit point of view. The experiences outlined in the comment have been incorporated into the applicant's summary assessments cited at the beginning.								
	Submitter:	Alternative:						Attachments:

Reference number and date:		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 983 Date: 2016/06/17 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Confidential Country: Confidential					Our own experience of alternatives within the company — in particular in the case of matt and black chrome — has not yielded any alternatives that are suitable for high volume production and process-capable either in terms of the material (e.g.: chromium III) or the technology (e.g.: PVD, paint) used.		Comment 983 Attachment.pdf
Applicants' response:								
115 years of experience in surface technology speak for themselves. The applications of the requested use are utilised in diverse ways. There is no alternative solution for the achievable properties; the company therefore agrees with the dossier in every way. No negative effects on health have been observed in the business to date. With a 20% share of sales, a loss of this use would present a major existential risk for the company.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 980 Date: 2016/06/17 Type of comment	Affiliation: Individual Type/Role in the supply chain: Name of org/company:					Based on our experience, substitution of CrO3 is not currently possible and there is no viable alternative for its use. Its high levels of wear resistance and resilience over long periods		Comment 980 Attachment.pdf

<p>:*</p> <p>The comment provides information that is generally in support of the application</p>	<p>Country: Germany</p>					are unmatched. Only by using CrO3 can a long service life of piston rods, valves, crank shafts and similar products be achieved.		
<p>Applicants' response:</p> <p>The commenting company Viemetall states that as a user of chromium trioxide it itself performs surface modifications based on solutions containing chromium trioxide. Based on its many years of experience, it comes to the conclusion that renunciation of these technologies would lead to substantial degradations or even a loss of products in many areas. To this extent, the comment is fully consistent with the dossier for the application for authorisation.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
<p>Ref.No:976</p> <p>Date: 2016/06/17</p> <p>Type of comment :*</p> <p>The comment provides information that is generally in support of the application</p>	<p>Affiliation: BehalfOfACompany</p> <p>Type/Role in the supply chain: Manufacturer</p> <p>Name of org/company: Mero-TSK International GmbH & Co. KG</p> <p>Country: Germany</p>					Comment regarding galvanic chromium plating with chromium trioxide.		Comment 976 Attachment.pdf

Applicants' response:

The company Mero TSK manufactures facade structures made of steel girders and glass as well as flexible systems for use in interior design, airport technology and for innovative exhibition systems. The company continuously tests other processes, such as wet lacquering or powder coating. The alternative "chrome look" which was propagated for visual processes some time ago was unable to live up to either the technical or the economic requirements. The comment shows in turn that alternatives which have been discussed can only be considered once they have demonstrated their suitability in application.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 973 Date: 2016/06/17 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: <i>Confidential</i> Country: <i>Confidential</i>					see complete version		Comment 973 Attachment.pdf

Applicants' response:

The company states that no other technology can be considered for its customers. With an [REDACTED] share of sales, a change in technology would, in addition to the lack of technical feasibility, place an excessive strain on the company's finances, organisational structure and personnel. Non-granting of the authorisation or shortened review periods would very obviously be disproportionate for a company that has invested heavily in measures to minimise risk.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	

Ref.No: 969 Date: 2016/06/16 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Other Name of org/company: Confidential Country: Confidential					There are no alternatives to the existing quality of high-gloss chromium plating for our company. Alternatives in the areas of trivalent chromium, zinc, zinc-iron, zinc-nickel were not acceptable to customers and do not offer the same value highlighted by chromium plating's blue high gloss.		Comment 969 Attachment.pdf
---	---	--	--	--	--	---	--	--

Applicants' response:

The commenting company is involved in a specific sector itself as a customer of the surface industry. It states in detail that it requires the properties of the surface modifications resulting from chromium-trioxide-based applications for its specific products. It faces international (non-European) competition in which these surfaces are demanded. It is therefore reliant on these technologies through service companies to be able to defend its market shares.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 965 Date: 2016/06/16 Type of comment : * The comment provides	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain: Industry or trade association Name of org/company:					See alternatives listed in the Analysis of Alternatives (AoA) under consultation 0064-02, -03, 04.		Comment 965 Attachment.doc

information that is generally in support of the application	VDA, Verband der Automobilindustrie e.V. Country: Germany							
Applicants' response:								
The VDA explicitly supports the positions and formulation of the application of HAPOC GmbH & Co KG. It has appended its own position paper. In the view of the applicant, the agreement of one of the largest industry associations obviously suggests that its disproportionate restriction of the requested use, which is widespread and for which there is no alternative in most sectors, harbours considerable risks for large parts of European industry. This contrasts with very questionable potential, which is undoubtedly extremely small at the very most, to reduce risk.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 960 Date: 2016/06/16 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Rolls-Royce Power Systems AG Country: Germany					Currently there are no suitable alternatives available for Chromium trioxide for the use in functional hard chrome plating. Rolls-Royce Power Systems favors the issue of authorization for Chrome (VI) compounds for use in functional chroming processes.		Comment 960 Attachment. pdf
Applicants' response:								
The commenting company Rolls-Royce power systems AG states, as a globally operating customer of the surface industry, with professional expertise citing its own experiences, the need for the continued use of chromium-trioxide-based surface technologies.								

In the view of the applicant, the agreement of a globally operating company obviously suggests that a disproportionate restriction of the requested use, which is widespread and for which there is no alternative in most sectors, harbours considerable risks for large parts of European industry. This contrasts with very questionable potential, which is undoubtedly extremely small at the very most, to reduce risk.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 956 Date: 2016/06/16 Type of comment : The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Hartchrom GmbH Country: Germany					It is not possible to replace chromium trioxide since the customer does not accept any alternatives as potential alternatives do not meet the required specifications.		Comment 956 Attachment.pdf

Applicants' response:

Hartchrom GmbH Werner Kreuz is another service business for the requested use that confirms that scenarios highlighted by the applicant.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 953 Date: 2016/06/16	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					Currently there are no suitable alternatives available for Chromium trioxide for the use in functional hard chrome plating. Rolls-Royce		Comment 953 Attachment.pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/company: Rolls-Royce Power Systems AG Country: Germany					Powersystems favors the issue of authorization for Chrome (VI) compounds for use in functional chroming processes.		
Applicants' response:								
<p>The commenting company Rolls-Royce power systems AG states, as a globally operating customer of the surface industry, with professional expertise citing its own experiences, the need for the continued use of chromium-trioxide-based surface technologies.</p> <p>In the view of the applicant, the agreement of a globally operating company obviously suggests that a disproportionate restriction of the requested use, which is widespread and for which there is no alternative in most sectors, harbours considerable risks for large parts of European industry. This contrasts with very questionable potential, which is undoubtedly extremely small at the very most, to reduce risk.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 949 Date: 2016/06/16 Type of comment :* The comment provides information that is generally in support	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: GMN Paul Müller Industrie GmbH & Co. KG Country: Germany					From a technical and commercial viewpoint, there are currently no alternatives to the use of chromium trioxide.		Comment 949 Attachment.pdf

of the application								
Applicants' response:								
The commenting company produces a large number of special components for the machine tool industry. This requires a large number of surface properties to be guaranteed simultaneously. In particular, there is a need to recondition the high-precision components. GMN sets out in detail why parallel technologies are not a suitable alternative.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 946 Date: 2016/06/15 Type of comment :* The comment provides information that is generally not in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: POLIGRAT GmbH Country: Germany					POLIGRAT has developed an alternative process for dyeing stainless steel, the VEROSPECTRAL process. It substitutes the colouring process based on chromium acid which has been marketed as POLISPECTRAL-process. VEROSPECTRAL® is a colorless, transparent glassceramic coating, safely adherent to the metal surface and containing inorganic pigments.		Comment 946 Attachment.pdf
Applicants' response:								
1. Responses / remarks in relation to the comments The commenter presents two processes which it has developed (see also Ref. 945). The first, VEROSPECTRAL, is developed as an alternative to the process of colouring using chromic acid (POLISPECTRAL process). Reference is made to a new patent specification from 2015. The process is based on the formation of a sol-gel layer by heat treatment at between 200°C and 250°C using colour pigments.								

2. Testing of the process by the service providers

The service providers using it (company Lahner, Ref. 927, and company Berndorf Bäderbau, Ref. 908, as users) are already familiar with the process of a sol-gel layer. For instance, it has already been tested in the area of swimming pool products.

The processes which are currently used successfully for colouring stainless steel modify and strengthen the natural passive layer of the stainless steel and therefore utilise the properties of the material itself without adding any extra substances. A chromium (III) oxide-rich transparent coating forms. Depending on the coating thickness, the interference effects of incoming light result in the characteristic colour tones. No dyes or pigments are added.

Whereas the larger manufacturers overwhelmingly perform colouring themselves based on chromium trioxide, the smaller manufacturers have the stainless steel coloured at an external service provider or lacquer the stainless steel. The quality of the lacquered surfaces produced thereby is considerably inferior to the surfaces coloured with chromium trioxide. Once in use, the lacquer flakes off in the water and crevice corrosion appears as well, which can lead to the complete penetration by rust of the bottom of the swimming pool.

It is important to stress that the external service provider must cater for the full range of customers' requirements.

These experiences show that it is applicable under certain conditions. The essential limitation is provided by the high thermal load of the base material. This process is therefore not suitable for use in the swimming pool sector as here a corresponding heat treatment of up to 250°C to produce a strip on "aligned" 6-metre-long stainless steel boards may lead to corresponding wave formations (thermal stresses) as a result of the heat treatment.

Furthermore, the process does not allow embossing, which is required for specific parts, as this will mechanically deform and damage the coating.

There is also a lack of any long-term experience with the coating adhesion on the base material, the corrosion resistance in chlorinated water, the UV resistance etc.

Overall, it is a complicated and costly process which can only be used to a limited extent.

3. Reference to previous applications (here CTAC):

Here too the applicant would like to refer to the comments made by the CTAC, which emphasises its many years of experience with Poligrat products:

"The commenter presents two commercially available products for the passivation of steel. The product "POLINOX PassTec" is composed of magnesium nitrate hexahydrate, phosphonobutane tricarboxylic acid, maleic anhydride, and sodium 3-nitrobenzenesulfonate. The product "POLINOX B Protect" is composed of magnesium nitrate hexahydrate, citric acid, sodium 3-nitrobenzenesulfonate and etidronic acid.

As stated in the AoA for Use 4, products based on citric and nitric acid "can be used and are already implemented for decades, although they may not be applicable to all kinds of stainless steels. However, research is ongoing."

The aerospace sector mandates a complex approval process to be completed before a substance/technology can be implemented. Depending on the type of steel, requirements for corrosion resistance up to 750 hours must be fulfilled. For the products mentioned by POLIGRAT, no information on the

performance of the passivated product was provided. None of the stainless steels used in the aerospace industry have been included in the PassTec test programme. Martensitic precipitation-hardened stainless steels are the most challenging ones to protect without Cr(VI).

Several companies in the aerospace sector stated that they have not previously tested the mentioned products. Before beginning any test program it would be helpful if the commenter could provide technical data in English as well as its own test data showing that key OEM requirements are met for a range of alloys. At this point a decision by each individual OEM can be made to initiate testing, or not. In order for this candidate alternative to be selected for qualification and certification, it would need to meet the key OEM-specific requirements for the specific alloys where nitric acid and citric acid are not currently qualified.

Based on available information, the products presented by POLIGRAT can currently not be considered as alternatives to chromium trioxide. According to the fact, that the products are not yet under R&D at OEMs from the aerospace sector, at least 12 to 15 years are necessary for passing the complex and time-consuming development and approval process until full implementation of the alternative products into the supply chain."

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 943 Date: 2016/06/15 Type of comment : * The comment provides information that is generally not in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: POLIGRAT GmbH Country: Germany					Electrochemical working process working with current and without chromiumtrioxide for electropolishing of all kind of metals such as stainless steel alloys, mild and tool Steel, aluminium, titanium. Chemical working process working without current and without chromiumtrioxide for chemical polishing of metals such as Mild and Tool Steel , zinc.		Comment 943 Attachment.pdf

Applicants' response:

1. Responses / remarks in relation to the comments

The commenter presents two processes which it has developed (see also Ref. 948).

The second process presented here includes various solutions for staining (material removal, can be used for staining and decoating) which have already been commercially available for many years and are optimised for various metals (Poligrat E268 for steel alloys, Poligrat E520 for different metals, Poligrat E285 for aluminium and aluminium alloys, Carbochem C600 for tool steel). The commenter states a considerable, acutely toxic potential hazard for each solution. The applicant assesses the potential hazard to be comparable as it is based essentially on the hazard posed by the acids. In both cases, this acutely toxic situation compels the operator to exercise extreme caution. In addition, the use of a large quantity of strong acids presents particular challenges when it comes to waste-water treatment.

2. Testing of the process by the service providers

Series of tests for different material qualities already exist with the latter process. However, the processes are not able to replace the required oxidising function of the chromium trioxide. This resides in the fact that foreign particles are reliably oxidised on the surface. At the same time, the passivating effect of the chromium trioxide ensures that the material can be removed with control, which consequently protects the base material. For materials that are coatings and can be passivated, such as steel substrates, it ensures that this base material is not attacked (passivation effect). This is stated in detail in the dossier.

3. Reference to previous applications (here CTAC):

Here too the applicant would like to refer to the comments made by the CTAC, which emphasises its many years of experience with Poligrat products:

„The commenter presents two commercially available products for the passivation of steel. The product “POLINOX PassTec” is composed of magnesium nitrate hexahydrate, phosphonobutane tricarboxylic acid, maleic anhydride, and sodium 3-nitrobenzenesulfonate. The product “POLINOX B Protect” is composed of magnesium nitrate hexahydrate, citric acid, sodium 3-nitrobenzenesulfonate and etidronic acid.

As stated in the AoA for Use 4, products based on citric and nitric acid “can be used and are already implemented for decades, although they may not be applicable to all kinds of stainless steels. However, research is ongoing.”

The aerospace sector mandates a complex approval process to be completed before a substance/technology can be implemented. Depending on the type of steel, requirements for corrosion resistance up to 750 hours must be fulfilled. For the products mentioned by POLIGRAT, no information on the performance of the passivated product was provided. None of the stainless steels used in the aerospace industry have been included in the PassTec test programme. Martensitic precipitation-hardened stainless steels are the most challenging ones to protect without Cr(VI).

Several companies in the aerospace sector stated that they have not previously tested the mentioned products. Before beginning any test program it would be helpful if the commenter could provide technical data in English as well as its own test data showing that key OEM requirements are met for a range of alloys. At this point a decision by each individual OEM can be made to initiate testing, or not. In order for this candidate alternative to be selected for qualification and certification, it would need to meet the key OEM-specific requirements for the specific alloys where nitric acid and citric acid are not currently qualified.

Based on available information, the products presented by POLIGRAT can currently not be considered as alternatives to chromium trioxide. According to the fact, that the products are not yet under R&D at OEMs from the aerospace sector, at least 12 to 15 years are necessary for passing the complex and time-consuming development and approval process until full implementation of the alternative products into the supply chain.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 940 Date: 2016/06/15 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Anke GmbH & Co. KG Country: Germany					In our experience, it is not possible to replace the chromium trioxide as there is no single substance or single technology available which can fully replicate our service.		Comment 940 Attachment.pdf

Applicants' response:

The company Anke GmbH & Co KG states, as a user of solutions containing chromium trioxide for surface modification, that it always has to compete with "alternative technologies". Despite this competition, Anke manages to retain a stable market share. There are no discernible general alternatives for this service provider and its customers either.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 933	Affiliation: BehalfOfACompany					Currently there is no sufficient alternative, that can handle the		Comment 933 Attachment.pdf

Date: 2016/06/14 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/company: Adler Galvano GmbH Country: Germany					requirements, fulfilled by Chromium trioxide.		
Applicants' response:								
The company Adler Galvano GmbH likewise cannot find any suitable alternative to chromium-trioxide-based surface modifications for its applications.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 929 Date: 2016/06/14 Type of comment :* The comment provides information that is generally in support	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: ESN Deutsche Tischtennis Technologie GmbH Country: Germany					From our perspective, there is no alternative, because using hard chrome meets all our requirements.		Comment 929 Attachment.pdf

of the application								
Applicants' response:								
<p>The comment confirms on the one hand that in most sectors of industry there is no alternative to the requested use in spite of decades of research in some cases and intense competition. But in addition, the comment demonstrates particularly clearly the number of different branches of industry and manufacturing in which the requested use provides the foundation for added value. It can be assumed that many sectors are not yet known about as the problems associated with authorisation possibly not being granted have not yet affected them.</p> <p>The applicant would again like to point out in particular that the requested use, carried out at service companies, is intermeshed within the industrial landscape in an extremely complex way. The consequences of a lack of authorisation or shortened review periods are still largely incalculable. Ill-considered measures can quickly lead here to serious consequences that would only be evident once they arise and would be irreversible.</p>								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 925 Date: 2016/06/14 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Lahner KG Country: Austria					In our experience, it is not possible to use a substitute for chromium trioxide, because only chromium trioxide coatings can cover the broad spectrum of essential customer requirements.		Comment 925 Attachment.doc
Applicants' response:								
The scenarios of the application are again confirmed in full. The commenting company is itself a service provider of the requested use for end applications, some of which are specific, but also in the contract coating sector. Despite constant reviews with new parts, it has so far not been possible to find any alternative.								

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 922 Date: 2016/06/14 Type of comment : * The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Breyer GmbH Country: Germany					The surface quality we currently provide for our high-grade components can only be achieved using electrolytically deposited chrome plating (chromium trioxide). At the present time there are no other coatings that can provide the required roughness values and gloss level. You will find the details in the complete version we have uploaded.		Comment 922 Attachment.doc
Applicants' response: The customer company of the service providers in the surface industry makes the situation succinctly clear: The necessary properties of the surface can only be delivered with chromium-trioxide-based technology (functional chromium plating), so service companies offering the requested use are absolutely essential. If these companies are not available or only available insufficiently, relocation would be essential but this would not be feasible for cost reasons. The business segment would be greatly endangered among international competition.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 919 Date: 2016/06/13	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User					In our experience, there is no possible substitute for chromium trioxide. There is no other way of producing hard chrome plating.		Comment 919 Attachment.pdf

Type of comment :* The comment provides information that is generally in support of the application	Name of org/ company: Hartchrom Beuthel GmbH Country: Germany							
Applicants' response: The company Hartchrom Beuthel describes the situation of a surface technology service provider that offers surface modification of any components using chromium-trioxide-containing aqueous solutions. In its own words, it regularly caters for more than 300 customers who prescribe precisely the technology that is on offer for their products. The specific components can change here in an arbitrary way. The customers of the company Hartchrom Beuthel tested various technologies that exist in parallel and identified and specified the chromium-trioxide-based technology as the one that they require. It can be assumed that the customers will continue to need to access the chromium-trioxide-based technology of the type offered by Hartchrom Beuthel, for example.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 915 Date: 2016/06/13 Type of comment :* The comment provides information that is generally	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/ company: Kunststofftechnik Bernt GmbH Country: Germany					It is not possible to use a substitute for chromium trioxide because: 1) There is not sufficient production capacity for any conceivable alternative. 2) No conceivable alternative can fully replace the existing processes. 3) As far as the automotive industry is concerned, long product life cycles mean that any process change is		Comment 915 Attachment.pdf

in support of the application						necessarily drawn-out and difficult.		
Applicants' response:								
The commenting company operates both as a parts manufacturer (plastic injection moulding) and as a service company with the requested use. The companies engaged in plastic coating in particular have invested heavily in seeking to find suitable alternatives. However, it has not yet been possible to replace chromium trioxide without losses in product safety and quality. The customers expect production commitments for way beyond 10 years ahead. Without authorisation of the requested use or with shortened review periods, it would not be possible to cater for a large number of potential orders. The competitiveness and existence of the company would be in great jeopardy. What is striking with this type of company in particular is that the loss of the requested use would not just mean that the directly affected employees would lose their jobs. The preparatory activities could not be maintained either, thus multiplying the number of employees affected.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 912 Date: 2016/06/10 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Kurt Zecher GmbH Country: Germany					In our experience, it is not possible to use a substitute for chromium trioxide, because none of the known alternatives provides all the technical properties of an electrolytically deposited chromium trioxide coating.		Comment 912 Attachment.docx
Applicants' response:								
The scenarios of the application are again confirmed in full. The commenting company is itself a service provider of the requested use for end applications, some of which are specific, but also in the contract coating sector. Despite constant reviews with new parts, it has so far not been possible to find any alternative.								

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 909 Date: 2016/06/09 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Berndorf Metall- und Bäderbau GmbH Country: Austria					On the basis of our experience it is not possible to substitute chromium trioxid. Alternative methods don't create coatings, which conform to requirements of end users.		Comment 909 Attachment.pdf
Applicants' response: In another specific sector, the company Berndorf Metall- und Bäderbau GmbH describes very vividly how irreplaceable the surface properties are that result from the use of chromium-trioxide-containing solutions. It will obviously be essential in most sectors to maintain these technologies, so to authorise them. In the present comment, the lack of alternatives in a specific end application becomes very clear. The service provider with the requested use is therefore also essential.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 905 Date: 2016/06/03	Affiliation: BehalfOfAnOrganisation Type/Role in the supply chain:					Hard Chrome plated surfaces provide unique combination of key functionalities that are indispensable for many uses. Alternatives for		Comment 905 Attachment.pdf

Type of comment :* The comment provides information that is generally in support of the application	Industry or trade association Name of org/company: VDMA- German Engineering Association Country: Germany					surface coatings tested by member companies of our individual engineering sectors did not offer the same functional profile.		
Applicants' response: Like the VDA previously, the German Mechanical Engineering Industry Association also confirms that there is largely a lack of alternatives in its own industry to the requested use. The entire mechanical engineering industry – one of the largest around – makes use of the service companies in the surface technology sector that offer the requested use. The absence or restriction of the availability of this use would have serious, unforeseeable consequences for the industrial applications in customer sectors. A number of examples are cited by the VDMA.								
Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 902 Date: 2016/06/01 Type of comment :* The comment provides information that is generally in support of the	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Wilhelm Bauer GmbH & Co.KG Country: Germany					We consider that a substitution of chromium trioxide is currently not possible since there are no alternatives that can cover the necessary range of properties required in the end product.		Comment 902 Attachment.pdf

applicatio n								
Applicants' response:								
The scenarios of the application are again confirmed in full. The commenting company is itself a service provider of the requested use for end applications, some of which are specific, but also in the contract coating sector. Despite constant reviews with new parts, it has so far not been possible to find any alternative.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classificati on and Labelling	
Ref.No: 899 Date: 2016/05/25 Type of comment : The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: <i>Confidential</i> Country: <i>Confidential</i>					We cannot forego chromium plating as it is an essential feature of our products.		Comment 899 Attachment.doc
Applicants' response:								
Following detailed representation, the commenting company comes to the conclusion that for its components no technically and/or economically feasible alternative to the requested use exists.								
Referenc e number and date:	Submitter:	Alternative:						Attachments:
		Type	Generi c name	EC Numbe r	CAS Numbe r	Description of technical alternative	Classification and Labelling	
Ref.No: 895	Affiliation: BehalfOfACompany					SMC as the manufacturer of		Comment 895 Attachment.docx

Date: 2016/05/22 Type of comment :* The comment provides information that is generally in support of the application	Type/Role in the supply chain: Downstream User Name of org/company: SMC Pneumatik GmbH Country: Germany					pneumatic actuators is the downstream user of piston rods with hardchromated surface. The use of hardchrome is necessary as it have good emergency running conditions as well as a long lifetime with side loads due to its hardness.		
--	---	--	--	--	--	---	--	--

Applicants' response:

SMC Pneumatik GmbH likewise confirms the essential demand for surfaces whose properties are generated by technologies using chromium-trioxide-containing solutions. Each granted authorisation for such technical components with no alternative confirms the demand for chromium-trioxide-containing solutions, and this dossier requests the authorisation to produce them. An alternative to these solutions and their production is inconceivable.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 891 Date: 2016/05/19 Type of comment :* The comment provides	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Groz Beckert KG / Groz Beckert CZ s.r.o. Country:					In our view and experience, alternative processes are currently unable to match the functional properties of hard chromium coatings deposited from		Comment 891 Attachment.pdf

information that is generally in support of the application	Germany					hexavalent chromium electrolytes. Please refer to the attached comments for further details.		
---	---------	--	--	--	--	--	--	--

Applicants' response:

The company Groz Beckert uses chromium-trioxide-based hard chromium plating processes at four sites, two of which are within the EU, to coat tools for textile machinery in various supply chains. Optimum gliding behaviour of yarns on tools coated with hard chromium can be generated thanks to the anti-adhesive effect. The company is testing various possibilities for the modified and widespread use of alternative technologies. It has extensive experience in this area and is therefore ideally placed to help to develop the assessment in relation to usage and ultimately implement it. Experiences show that it is only possible to utilise another technology in individual cases. The experiences outlined in the comment have been incorporated into the applicant's assessments cited at the beginning.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 888 Date: 2016/05/19 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Manufacturer Name of org/company: Derichs GmbH Country: Germany					In our opinion there is no alternative to using chrometrioxyd, because alternatives either are not tested enough or technical not feasible for our (or our customers) requirements.		Comment 888 Attachment.docx

Applicants' response:

The company Derichs is involved in a specific sector itself as a customer of the surface industry. It states in detail that it requires the properties of the surface modifications resulting from chromium-trioxide-based applications for its specific products.

Reference number and date:	Submitter:	Alternative:						Attachments:
		Type	Generic name	EC Number	CAS Number	Description of technical alternative	Classification and Labelling	
Ref.No: 85 Date: 2016/05/19 Type of comment :* The comment provides information that is generally in support of the application	Affiliation: BehalfOfACompany Type/Role in the supply chain: Downstream User Name of org/company: Chrom-Schmitt GmbH & Co. KG Country: Germany					See Point 2, "Public version" of the Annex. What is described is a technical alternative that is plainly not available, as it cannot match the many necessary properties of surface systems produced using chromium trioxide.		Comment 884 Attachment.pdf
Applicants' response:								
The company is itself a provider of services with the requested use. Its detailed information makes it clear that no technically and economically feasible alternative can exist for a company of this type! The statements are therefore fully consistent with the results of the present application for authorisation.								