



**24 SEPTEMBER 2012**

**Comments received on ECHA’s Draft 4th Recommendation for Pentazinc chromate octahydroxide (EC number: 256-418-0)**

*This document provides the comments received during the public consultation on ECHA’s draft 4<sup>th</sup> Recommendation for inclusion of substances in Annex XIV of REACH, which took place between 20 June and 19 September 2012.*

*ECHA’s responses to these comments are provided in a separate document:*

[http://echa.europa.eu/documents/10162/13640/axiv\\_4th\\_recommendation\\_chromiumvi\\_substances\\_rcom\\_en.pdf](http://echa.europa.eu/documents/10162/13640/axiv_4th_recommendation_chromiumvi_substances_rcom_en.pdf)

*N.B.: All public attachments are provided in a separate zip-file available on ECHA’s website (attachments claimed confidential are not provided with the public version of this compilation of comments received).*

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## I - General comments on the recommendation to include the substance in Annex XIV, including the prioritisation of the substance:

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
21	2012/09/19 21:30	European Environmental Bureau (EEB)  International NGO Belgium	The EEB supports the inclusion of this substance in Annex XIV due to its hazardous properties, high production volumes and wide spread uses. The use of this substance in the market is having adverse consequences for public health and environment and should be banned at European level.
20	2012/09/19 21:19	ChemSec  International NGO Sweden	We support the recommendation to include this substance in Annex XIV.
19	2012/09/19 20:16	TAP-Air Portugal  Company Portugal	<p>At TAP we provide MRO (maintenance, repair and organisation) services at the same time as we guarantee a whole raft of your requirements ranging from safeguarding air safety, properly managing aircraft operation, and minimizing costs.</p> <p>TAP is part of the Association of European Airlines (AEA) and works closely together on relevant technical issues if necessary.</p> <p>The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe), the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe.</p> <p>Therefore the following statement is identical for several AEA members.</p> <p>In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.</p> <p>Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA)</p>

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			<p>and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications. Any alternatives must be compatible with systems on existing and in-production fleets.</p> <p>The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium Chromate).</p>
18	2012/09/19 18:59  Confidential attachment removed	BRUSSELS AIRLINES  Company Belgium	see attached document AEA statement_brusselsairlines pentazinc chromate octahydroxide.pdf
17	2012/09/19 18:02  Confidential attachment removed	Individual  France	<p>General Comments</p> <p>In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.</p> <p>Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications. Any alternatives must be compatible with systems on existing and in-production fleets.</p>

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16	2012/09/19 17:45	European Trade Union Confederation  Trade union Belgium	ETUC supports the recommendation to include this substance in the Authorisation list. We
15	2012/09/19 16:48	Lufthansa Technik  Company Germany	<p>Lufthansa Technik appreciates the possibility to comment this draft recommendation. Lufthansa Technik is the leading provider of maintenance, repair, overhaul and modification services for civil aircraft. With tailored maintenance programs and state-of-the-art repair methods, Lufthansa Technik ensures the unbroken reliability and availability of its customers' fleets. Lufthansa Technik is an internationally licensed maintenance, production and development organization. The six business units of Lufthansa Technik (Maintenance, Overhaul, Component Services, Engine Services, VIP Services and Landing Gear Services) serve about 750 customers worldwide.</p> <p>The following comment is also stated for the Lufthansa Technik Group subsidiaries Lufthansa Technik Airmotive Ireland, Lufthansa Technik Aero Alzey, Lufthansa Technik Budapest, Lufthansa Technik Brussels, Lufthansa Technik Landing Gear Services UK, Lufthansa Technik Maintenance International, Lufthansa Technik Malta, Lufthansa Technik Milan, Lufthansa Technik Sofia and Lufthansa Technik Turbine Shannon.</p> <p>Via the Lufthansa Group we are part of the Association of European Airlines (AEA) and work closely together with other AEA members on relevant technical issues, if necessary.</p> <p>The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe), the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe.</p> <p>Therefore the following statement is identical for several AEA members.</p> <p>General Comments In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and</p>

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			<p>usage conditions through normal and required use.</p> <p>Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications. Any alternatives must be compatible with systems on existing and in-production fleets.</p> <p>The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and AEA and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium Chromate).</p> <p>Use of Pentazinc Chromate Octahydroxide</p> <p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p>Primer application This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed. This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p>Sealants Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p>

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			<p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations</p> <p><b>Research efforts</b>            All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications. Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p><b>Challenges</b>            The inclusion of Pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs. Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p>

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			This is why Lufthansa Technik strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.
14	2012/09/19 16:40	Scandinavian Airline System  Company Norway	<p>Scandinavian Airline System is part of the Association of European Airlines (AEA) and works closely together on relevant technical issues if necessary.</p> <p>The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe), the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe.</p> <p>Therefore the following statement is identical for several AEA members.</p> <p>General Comments        In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.        Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications.        Any alternatives must be compatible with systems on existing and in-production fleets.</p> <p>The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium Chromate).</p>

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13	2012/09/19 16:34	KLM  Company Netherlands	<p>KLM Engineering &amp; Maintenance (KLM E&amp;M) is a part of the AirFrance KLM group and works closely together with Air France Industries. At AFI KLM E&amp;M we provide MRO (maintenance, repair and organisation) services at the same time as we guarantee a whole raft of your requirements ranging from safeguarding air safety, properly managing aircraft operation, and minimizing costs. We are supported in this by our 75-year-plus track record during which we have achieved a level of undisputed excellence in managing large aircraft fleets. Next to the Airfrance and KLM fleet we have over 150 customers world wide.</p> <p>KLM Engineering &amp; Maintenance is part of the Association of European Airlines (AEA) and works closely together on relevant technical issues if necessary.</p> <p>The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe), the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe. Therefore the following statement is identical for several AEA members.</p> <p>General Comments In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use. Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications. Any alternatives must be compatible with systems on existing and in-production fleets.</p> <p>The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium Chromate).</p>



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			<p>Use of pentazinc chromate octahydroxide</p> <p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p><b>Primer application</b>          This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed.          This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p><b>Sealants</b>          Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p> <p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations</p> <p><b>Research efforts</b>          All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion</p>

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			<p>protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications. Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p>Challenges The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p> <p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.</p>
12	2012/09/19 15:46  See attachment #12_pentazinc. pdf	AUSTRIAN AIRLINES AG  Company Austria	See attached document "AEA_Austrian_comment_ pentazinc chromate octahydroxide"

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
11	2012/09/19 15:30	Finnair Technical Services Oy  Industry or trade association Finland	<p>Finnair Technical Services is a maintenance organization consisting of two companies, Finnair Technical Services Ltd. and Finnair Engine Services Ltd. Both companies are owned by Finnair Plc. The principal shareholder of Finnair Plc. is the State of Finland.</p> <p>Finnair is part of the Association of European Airlines (AEA) and works closely together on relevant technical issues if necessary.</p> <p>The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe), the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe. Therefore the following statement is identical for several AEA members.</p> <p>In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.</p> <p>Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.</p> <p>Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications. Any alternatives must be compatible with systems on existing and in-production fleets.</p> <p>The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and EASA and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium Chromate).</p> <p>Use of pentazinc chromate octahydroxide</p>

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			<p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p><b>Primer application</b>            This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed.            This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p><b>Sealants</b>            Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p> <p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations</p> <p><b>Research efforts</b>            All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications.            Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft</p>

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			<p>developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p><b>Challenges</b>            The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p> <p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.</p>
10	2012/09/19 15:25  Confidential attachment removed	International organisation France	
9	2012/09/19 15:15	Association of European Airlines  Industry or trade association	<p>In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Pentazinc chromate octahydroxide's use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.</p> <p>Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials,</p>

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			<p>Research efforts            All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMS and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications. Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p>Challenges            The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p> <p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application</p>

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
			which means a complete stop for aviation business in Europe.
8	2012/09/19 11:04  See attachment #8_pentazinc.pdf	GIFAS  Industry or trade association France	see attached document
7	2012/09/19 10:29	MSCA  Sweden	We support the prioritisation of pentazinc chromate octahydroxide for inclusion in Annex XIV. The substance has relatively high priority due to relatively high volume and wide dispersive use. In addition, pentazinc chromate octahydroxide may be a substitute for other chromium(VI) compounds already prioritised for inclusion in Annex XIV.
6	2012/09/19 01:06  See attachment #6_pentazinc.pdf	Hawker Beechcraft Corporation  Company United States	Please see attachment
5	2012/09/18 16:45	Cessna Aircraft Company  Company United States	Pentazinc chromate octahydroxide is an essential substance used by aerospace suppliers in fabrication of chemical products such as sealants, anti-corrosion compounds and etc. for aerospace industry use. While our suppliers of these chemicals are conducting tests and research to find alternative substitutes, we have not been informed of availability or existence of suitable alternatives at this time. Aerospace specific use authorization should be given to aerospace suppliers until suitable alternative products with supporting test data become available.
4	2012/09/18 16:29 See attachment #4_pentazinc.pdf	ASD, Aerospace and Defence Industries of Europe  Industry or trade association Belgium	<p>Pentazinc chromate octahydroxide is used in the aerospace and defence sectors in wash primers, jointing compounds (sealants) for aluminium, steel or anodized aluminium substrates.</p> <p>These processes allow the industry to make use of the self healing corrosion protection properties in safety critical applications.</p> <p>Despite more than 20 years of testing alternatives, there are currently no known chrome VI free alternatives for these types of applications. The industry continues to research alternatives. However from the point at which a viable alternative becomes available, extensive empirical data will be required to establish product safety and function.</p>



#	Date	Submitted by (name, Organisation/ MSCA)	Comment
3	2012/09/14 16:35	MSCA  United Kingdom	<p>We have concerns over the priority given to this substance as it appears to be based on analogy to the uses and exposure levels of chromium trioxide, which we do not think has been sufficiently demonstrated.</p> <p>The exposure data which are used in the justification for all of these chromates to be included in Annex XIV are not substance specific. The reliability of the assumption that the data given in the Annex XV dossier for chromium trioxide would be the same as other Cr (VI) compounds has not been adequately addressed. This should be clarified with reference to the use of each substance relative to other Cr (VI) compounds.</p> <p>The arguments need to be strengthened with particular reference to how and where each of these chromium VI compounds are used and to show that there is a substance-specific risk that requires control. Metal treatment and surface finishing is a relatively broad sector and confirmation should be sought that these substances are actually used and for which processes and what exposure they really give rise to.</p> <p>We had concerns about the representativeness of these data when the chromium trioxide Annex XV dossier was produced, as there is no indication that the conditions under which these data were measured are applicable in all Member States. Now these same exposure data are being used to prioritise different chromium compounds without sufficient justification.</p>
2	2012/09/12 15:07	MSCA  Norway	The Norwegian CA supports the prioritisation of Pentazinc chromate octahydroxide for inclusion in Annex XIV.
1	2012/08/31 13:03 See attachment #1_pentazinc.p df	Company Spain	<p>The commercial aviation uses many primer, sealant, and adhesive materials that contain chromium compounds because these formulations provide corrosion protection that contributes to the safety of our airplanes. Many of these materials are also required when maintaining or repairing airplanes throughout their service life. Over the last 20 years, aircraft manufactures, Boeing for instance, have been working to find and develop materials that can replace chromium-containing products. While the research has been successful for some applications (e.g., exterior decorative paint/primer), there are some applications where the industry efforts have not yet found suitable materials that meet our engineering safety requirements. Attached is a representative list of products for which the industry has not found acceptable alternatives.</p> <p>Air Europa is extremely concerned about inclusion in Annex XIV of such products. If the proposed regulation goes into effect, this will adversely affect the industry's ability to maintain aircraft in Europe, so Air Europa will be presumably forced to accomplish such activity in non-EU countries in order to be able to maintain the airworthiness of the fleet, provided alternative materials will not be available in the type certification of the airplanes.</p> <p>The safety of aircraft operations relies on thoroughly tested and qualified products for maintenance. Forcing a ban or increasing administrative burdens for products without available alternative will diminish the safety.</p>

## II - Transitional arrangements. Comments on the proposed dates:

#	Date	Submitted by (name, Organisation/MSCA)	Comment
21	2012/09/19 21:30	European Environmental Bureau (EEB)  International NGO Belgium	As soon as possible
19	2012/09/19 20:16	TAP-Air Portugal  Company Portugal	<p>Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
17	2012/09/19 18:02	Individual  France	<p>Transitional arrangements</p> <p>Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is</p>

			<p>necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p> <p>Exemptions</p> <p>Due to its substance’s properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an ‘downstream user’ is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won’t be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
15	2012/09/19	Lufthansa Technik	Currently, no alternatives have been identified for most aerospace uses of pentazinc chromate octahydroxide

	16:48	Company Germany	<p>such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the pentazinc chromate octahydroxide materials. This is why Lufthansa Technik strongly supports the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, Lufthansa Technik urgently recommends an extended sunset date of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
14	2012/09/19 16:40	Scandinavian Airline System  Company Norway	<p>Transitional arrangements Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
13	2012/09/19 16:34	KLM  Company Netherlands	<p>Transitional arrangements Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p>

			<p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
11	2012/09/19 15:30	<p>Finnair Technical Services Oy</p> <p>Industry or trade association Finland</p>	<p>Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
9	2012/09/19 15:15	<p>Association of European Airlines</p> <p>Industry or trade association Belgium</p>	<p>Currently, no alternatives have been identified for most aerospace uses of Pentazinc chromate octahydroxide such as in primers and anti-corrosion interlay sealing compounds.</p> <p>Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Pentazinc chromate octahydroxide materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.</p> <p>Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.</p>
7	2012/09/19 10:29	<p>MSCA</p> <p>Sweden</p>	<p>We agree with the proposed dates.</p>

4	2012/09/18 16:29	<p>ASD, Aerospace and Defence Industries of Europe</p> <p>Industry or trade association Belgium</p>	<p>The extensive supply chain requires a “top-down” Authorisation approach, requiring extensive supply chain engagement in a consortium. Experience has shown that such consortia take years to form and deliver. There are many aspects of the process which are still unclear, particularly where large supply chains and multiple industry sector applicability are involved.</p> <p>We are in a situation where a new, complex and untried process is critical for our industry, and which will be implemented without industry having yet found a solution to this issue, despite substantial efforts applied. Industry needs time to develop its approach, to ensure that successful applications can be assured.</p> <p>A minimum 60 month delay from Annex XIV to publication is recommended, resulting in a sunset date in 2020 or later. This has the following benefits:</p> <ol style="list-style-type: none"> <li>1. To ensure a route can be found through the Authorisation application process in the difficult and unclear context described above;</li> <li>2. To increase the potential for alternatives to be found and substituted, thereby reducing the need for such Authorisation;</li> <li>3. To avoid unnecessary diversion of resources from the development and substitution of alternatives onto Authorisation activities.</li> <li>4. To allow for learning from Authorisation and substitute development relating to the 3rd Annex XIV recommendations.</li> </ol> <p>For products already in use that were manufactured using processes reliant on chromic acid, the continued maintenance and repair processes also rely on chromic acid being available for use both within and outside the European Economic Area.</p>
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### III - Comments on uses that should be exempted from authorisation, including reasons for that:

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
21	2012/09/19 21:30	European Environmental Bureau (EEB)  International NGO Belgium	All uses should be avoided
20	2012/09/19 21:19	ChemSec  International NGO Sweden	Being such a hazardous substance, no use should be granted a generic exemption from authorisation.
19	2012/09/19 20:16	TAP-Air Portugal  Company Portugal	<p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p><b>Primer application</b> This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed. This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p><b>Sealants</b> Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p> <p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major</p>

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
			<p>maintenance intervals and overhaul operations</p> <p>Research efforts All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications. Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p>Challenges The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p> <p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available</p>



#	Date	Submitted by (name, Organisation/ MSCA)	Comment
			<p>substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.</p> <p>Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
17	2012/09/19	Individual	Use of pentazinc chromate octahydroxide

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
	18:02	France	<p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p><b>Primer application</b>            This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed.            This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p><b>Sealants</b>            Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p> <p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations</p> <p><b>Research efforts</b>            All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications.            Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft</p>

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
			<p>developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p>Challenges The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p> <p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.</p>
15	2012/09/19 16:48	Lufthansa Technik  Company Germany	<p>Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European</p>

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
			<p>aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above Lufthansa Technik highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
14	2012/09/19 16:40	Scandinavian Airline System  Company Norway	<p>Use of pentazinc chromate octahydroxide</p> <p>Pentazinc chromate octahydroxide is widely used in the aerospace sectors within primers and sealants for aluminum, steel or anodized aluminum substrates. These processes allow the industry to make use of the corrosion protection properties in safety critical applications as well as the inherent properties that allow components to run against seals or in highly loaded applications such as the construction parts.</p> <p><b>Primer application</b> This process provides corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed. This process is used on structural components with expected life cycles in excess of 30 years e.g. military and civilian airlines and space equipment.</p> <p><b>Sealants</b> Anti-corrosion interlay sealing compounds are applied along a joint and faired or shaped to meet the required dimensions or are applied to one or more surfaces that will be placed in intimate contact upon assembly.</p>

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			<p>Many areas of the products needing primers and sealants are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations</p> <p><b>Research efforts</b>            All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMS and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications. Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for pentazinc chromate octahydroxide. Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness. This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.</p> <p><b>Challenges</b>            The inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.</p> <p>As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.</p>

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			<p>This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.</p> <p>Exemptions</p> <p>Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since</p>

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			<p>decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
13	2012/09/19 16:34	KLM  Company Netherlands	<p>Exemptions</p> <p>Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p>

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11	2012/09/19 15:30	Finnair Technical Services Oy  Industry or trade association Finland	<p>Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
9	2012/09/19 15:15	Association of European	Due to its substance's properties pentazinc chromate octahydroxide will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though



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		Airlines  Industry or trade association Belgium	<p>chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy pentazinc chromate octahydroxide and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing pentazinc chromate octahydroxide or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of pentazinc chromate octahydroxide in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.</p> <p>Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.</p> <p>Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.</p> <p>Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of pentazinc chromate octahydroxide from the authorization process.</p>
5	2012/09/18 16:45	Cessna Aircraft Company  Company United States	<p>Aerospace use of Pentazinc chromate octahydroxide should be exempted from the REACH regulation until suitable alternatives have been identified.</p> <p>Pentazinc chromate octahydroxide is used in the aerospace sector as an anti-corrosion agent for the formulation of primers and jointing compounds (sealants).</p>

#	Date	Submitted by (name, Organisation/ MSCA)	Comment
4	2012/09/18 16:29	ASD, Aerospace and Defence Industries of Europe  Industry or trade association Belgium	Any consideration of product sector exemption is only viable with continued and sustainable supply.
1	2012/08/31 12:46	Company Spain	Airplane maintenance accomplished by Maintenance Organizations approved in accordance with EASA Part 145. Airplane maintenance is done under a very controlled environment. Continuous audits in accordance with existing regulation are performed to ensure workers strictly adhere to the approved procedures. Already approved procedures in aviation maintenance require providing protective instructions for use of healthy-risk products. Thus adding further Authorization requirements in the aviation maintenance activity does not provide added value.

#### IV - Comments on uses for which review periods should be included in Annex XIV, including reasons for that:

#	Date	Submitted by (name, Organisation/MSCA)	Comment
19	2012/09/19 20:16	TAP-Air Portugal  Company Portugal	For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.
17	2012/09/19 18:02	Individual  France	Review periods For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.
15	2012/09/19 16:48	Lufthansa Technik  Company Germany	For the reasons outlined above, if extended application and sunset dates are not possible, Lufthansa Technik suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, Lufthansa Technik believes a review period of 5 - 10 years would be appropriate.
14	2012/09/19 16:40	Scandinavian Airline System  Company Norway	Review periods For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.
13	2012/09/19 16:34	KLM  Company Netherlands	Review periods For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.
11	2012/09/19 15:30	Finnair Technical Services Oy  Industry or trade association Finland	For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.
9	2012/09/19 15:15	Association of European Airlines	For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.

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		Industry or trade association Belgium	appropriate.
4	2012/09/18 16:29	ASD, Aerospace and Defence Industries of Europe  Industry or trade association Belgium	The Aerospace and Defence industry operates very long life cycle products, many in excess of 40 years in service. The industry is heavily regulated and the introduction of new processes and design changes (even when approved) still takes a considerable amount of time. In addition these new processes are unlikely to be backwards compatible - they cannot be used to repair or maintain products which are already in service (the original process will still be required).  In this context, the recommendation is for review periods of 10 years or more in order to reflect the complex nature of developing and obtaining approval for safe and functionally effective alternatives.