GENERAL SERVICE LETTER

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General Service Letter No. 2956/15 – 2nd issue

This General Service Letter supersedes the issue dated January 25, 2016

Subject: All variants
Change in the appearance of certain part numbers following the substitution of surface treatments in the context of European REACh regulations.

Dear Sir or Madam,

The purpose of this Service Letter is to inform you of the change in appearance of certain Safran Helicopter Engines part numbers. In the future, the use of certain substances will be prohibited under European REACh regulations. Therefore, Safran Helicopter Engines is committed to developing a substitution process for surface coatings and treatments used during the manufacture or repair of parts.

In some cases, new ingredients and/or new processes may introduce modifications to appearance and/or color. Technical performances are not in any way affected.

A list summarizing the main appearance changes is mentioned in the Appendix 1. This list is not exhaustive. In case of doubt, please contact your usual Safran Helicopter Engines representative.

Please contact us if you require further information or assistance.

Yours sincerely,

J.F. ESCURET
Technical Support Department

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FOR INFORMATION

APPENDIX 1

SUBSTRATE	Treatments affected by REACh	Substitution treatments	Significant cosmetic appearance deviations	Appendix 2 illustrated by picture:
Aluminum	Anodizing: CAA (Chromic Acid Anodizing) Standard SAA (Sulfuric Acid Anodizing)	Anodizing: SAA + Cr^{3+}, TSA with or without Cr^{3+}	Change in color from iridescent white or yellow-light green (sometimes intense golden yellow) to colorless-light opalescent gray-green (pictures in appendix 2.1)	1 2
Aluminum	Chemical conversion with Cr^{6+} "Alodine 1200"	Chemical conversion Cr^{3+}	Change in color from yellow-brown to colorless-iridescent bluish gray (pictures in appendix 2.2)	4
Magnesium	Chemical conversion with Cr^{6+} "Chromating"	Chemical conversion with Cr^{3+}	Change in color from dark-brown to light golden brown (pictures in appendix 2.3)	3
All families of steels	Hard chromium (process Cr^{6+})	HVOF thermal spraying WC/Co/Cr 86-10-4 (ground condition) Hard chromium, base Cr^{3+}	Change in color from glossy light gray with Cr^{6+} to dark mat gray with WC/Co	
Non- or low-alloyed steels	Alkaline oxidation	Alkaline oxidation (process without Cr^{6+})	No significant appearance change (dark brown to black)	
Non- or low-alloyed steels	Phosphate treatment with manganese or zinc	Phosphate treatment with manganese or zinc (process without Cr^{6+})	No significant appearance change	
Stainless steels and superalloys	Passivation	Passivation (process without Cr^{6+})	No significant appearance change	
All families of steels	Cadmium (passivation Cr^{6+})	Zinc-Nickel (passivation Cr^{3+})	Change from an iridescent yellowish to iridescent bluish appearance (pictures in appendix 2.4)	5
All families of steels and cuprous materials	Zinc (pure) (finishing Cr^{6+})	Zinc (pure) (finishing Cr^{3+})	Change in color from iridescent yellow or khaki green to opalescent light blue or green	
All families of steels	Category S paint (process with Cr^{6+})	Category S paint (process without Cr^{6+})	Change in color from khaki green to aluminum (pictures in Appendix 2.4)	6

APPENDIX 2

Information regarding changes in the appearance of certain Safran Helicopter Engines part numbers following the substitution of surface coatings and treatments affected by the European REACh regulation.

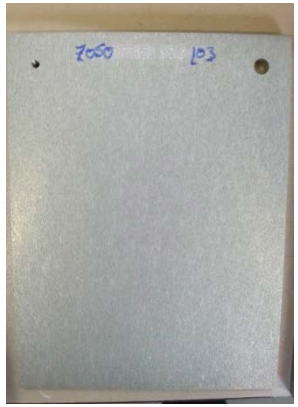
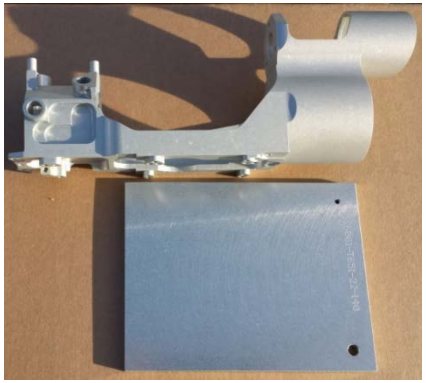
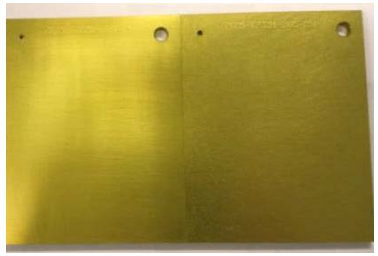
This document illustrates, with pictures, potential changes in the appearance of Safran Helicopter Engines part numbers.

This document has been distributed for information purposes only and shall not be updated.

Illustrations

The pictures below are not contractual, but they give an idea of possible color variations for certain treatments by comparing previous versions of treatment with new versions.

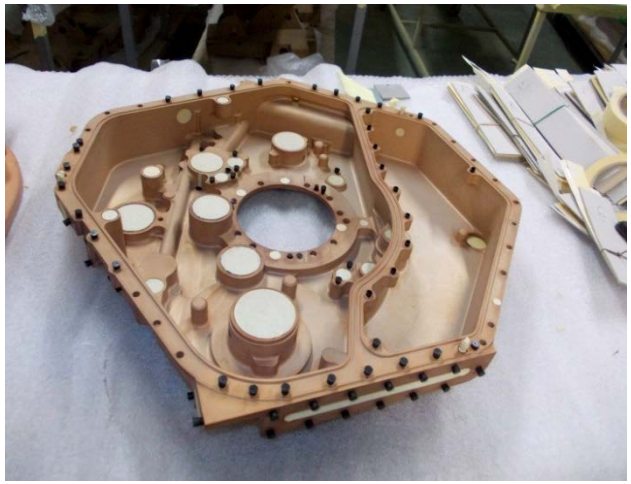
APPENDIX 2.1

PICTURE 1	**Aluminum Substrates / Before** Anodizing with Cr^{6+}: **CAA**	**After** Anodizing without Cr^{6+}: **SAA**
	 	 
PICTURE 2	**Aluminum Substrates / Before** Anodizing with Cr^{6+}: **SAA**	**After** Anodizing without Cr^{6+}: **TSA**
	  	 

APPENDIX 2.2

	Aluminum Substrates / Before Chemical Conversion with Cr^{6+} (Alodine 1200)	After Chemical Conversion with Cr^{3+}
PICTURE 4	 	 

APPENDIX 2.3

	Magnesium Substrates / Before Chemical conversion with Cr^{6+} (chromating)	**After** Chemical conversion with Cr^{3+}
PICTURE 3		

APPENDIX 2.4

PICTURE 5	**Steel Substrates / Before** Cadmium + passivation Cr^{6+}	**After** Zinc-Nickel + passivation Cr^{3+}
		
PICTURE 6	**Steel Substrates / Before** Category S paint - Khaki	**After** Category S paint – Aluminum