

Exemption Request Form

Date of submission: 2020-01-16

1. Name and contact details

1) Name and contact details of applicant:

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Name: Anton Lundqvist E-Mail: anton.lundqvist@dometic.com
Function: CTO Address: Hemvärnsgatan 15,
S-171 54 Solna, Sweden

2) Name and contact details of responsible person for this application (if different from above):

Company: Dometic Tel.: +46 70 7894903
Name: Bernt Andersson E-Mail: bernt.andersson@dometic.com
Function: Consultant Address: Hemvärnsgatan 15,
S-171 54 Solna, Sweden

2. Reason for application:

Please indicate where relevant:

- Request for new exemption in:
 Request for amendment of existing exemption in
 Request for extension of existing exemption in
 Request for deletion of existing exemption in:
 Provision of information referring to an existing specific exemption in:
 Annex III Annex IV

No. of exemption in Annex III or IV where applicable: 9a-II
Proposed or existing wording: Existing
Duration where applicable: 31.12.2025

Other: _____

3. Summary of the exemption request / revocation request

Dometic is applying for an extension of Exempt 9a-II in RoHS until 31 December 2025.
Please see more details in our letter and the attached documentation. We suggest the
same wording as for the existing (draft) exempt.

4. Technical description of the exemption request / revocation request

(A) Description of the concerned application:

1. To which EEE is the exemption request/information relevant?

Name of applications or products:

Anti corrosion inhibitor of the carbon steel cooling system for absorption refrigerators.

a. List of relevant categories: (mark more than one where applicable)

- | | |
|---------------------------------------|-----------------------------|
| <input checked="" type="checkbox"/> 1 | <input type="checkbox"/> 7 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 8 |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 9 |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 10 |
| <input type="checkbox"/> 5 | <input type="checkbox"/> 11 |
| <input type="checkbox"/> 6 | |

b. Please specify if application is in use in other categories to which the exemption request does not refer: No

c. Please specify for equipment of category 8 and 9:

The requested exemption will be applied in

- monitoring and control instruments in industry
- in-vitro diagnostics
- other medical devices or other monitoring and control instruments than those in industry

2. Which of the six substances is in use in the application/product?

(Indicate more than one where applicable)

- Pb Cd Hg Cr-VI PBB PBDE

3. Function of the substance:

Hexavalent chromium works very well as corrosion inhibitor thanks to a thin chromium oxide (Cr₂O₃) layer that is formed on the interior surface of the steel tubes. This layer is very thin and tight which protects the steel from further corrosion.

4. Content of substance in homogeneous material (%weight):

The average amount of Cr-vi used for an average model concerned is approximately 2 grams. The total refrigerant charge is 300 grams for this average model with a total weight of the product of 18 kg. Hence:

i) the concentration of Cr-vi in the homogenous material (the refrigerant) is approximately 0,6 % by weight.

ii) the concentration of Cr-vi in the application (the refrigerator) is less than 0,012 % by weight.

Details are attached in a separate document.

5. Amount of substance entering the EU market annually through application for which the exemption is requested:

Please supply information and calculations to support stated figure.

Approximately 100 kg per annum referring to units produced by Dometic. See detailed calculation for 2019 in the attached confidential document.

6. Name of material/component:

Sodium Chromate is used in the refrigerant (homogenous material) of cooling unit for absorption refrigerators

7. Environmental Assessment: _____

LCA: Yes

No

Comment: LCA of our fridges has been done, but the impact from the sodium chromate is limited in these analysis. The material databases are not well representing the effects of such substances.

(B) In which material and/or component is the RoHS-regulated substance used, for which you request the exemption or its revocation? What is the function of this material or component?

The substance, Sodium Chromate, is used as an additive to the refrigerant (cooling media) used in absorption refrigerators. Other components in the refrigerant are ammonia, water and hydrogen. Sodium Chromate is forming a thin corrosion protective layer of Chromium oxide on the interior tube surface

(C) What are the particular characteristics and functions of the RoHS-regulated substance that require its use in this material or component?

See B) above. A corrosion protective layer of hexavalent chromium has major technical advantages. To allow a long service life of the sealed cooling system the chromate protects the steel pipes from interior corrosion.

5. Information on Possible preparation for reuse or recycling of waste from EEE and on provisions for appropriate treatment of waste

1) Please indicate if a closed loop system exist for EEE waste of application exists and provide information of its characteristics (method of collection to ensure closed loop, method of treatment, etc.)

Yes, a closed loop exist for the product and the refrigerant. The products are covered by the WEEE directive and it is required to reclaim the refrigerant before other treatment of the refrigerator. Reclaimed refrigerant is considered hazardous waste and sent for separate treatment.

2) Please indicate where relevant:

- Article is collected and sent without dismantling for recycling
- Article is collected and completely refurbished for reuse
- Article is collected and dismantled:
- The following parts are refurbished for use as spare parts: _____
 - The following parts are subsequently recycled: See comments below
- Article cannot be recycled and is therefore:
- Sent for energy return
 - Landfilled

Comment 1: Refurbishment of complete refrigerators exist on some market, but the total number is very low (although increasing). We do not have figures on how many products (and consequently how much hexavalent chromium) this represent.

Comment 2: The products are at end-of-life recycled as other refrigerators in a step 1 process (reclaim of refrigerant) and step 2 (shedding and material separation).

Comment 3: Basically the whole refrigerator is recycled apart from the refrigerant and the insulation blowing agent that is treated as hazardous waste.

3) Please provide information concerning the amount (weight) of RoHS substance present in EEE waste accumulates per annum:

- In articles which are refurbished _____
- In articles which are recycled _____
- In articles which are sent for energy return _____
- In articles which are landfilled _____

For details on the Cr-vi content in products placed on the market 2019 we refer to Annex 1. The figures have not changed significantly over the last 10 years period. These products are all covered by the WEEE Directive and the refrigerant must be separately collected and treated at end-of-life.

The treatment at end-of-life for these products are covered by the package of new harmonised standards such as EN 50625

6. Analysis of possible alternative substances

(A) Please provide information if possible alternative applications or alternatives for use of RoHS substances in application exist. Please elaborate analysis on a life-cycle basis, including where available information about independent research, peer-review studies development activities undertaken

As we have described in previous applications for exemptions, Dometic (and previously Electrolux) has for a very long time put high attention in finding an alternative to Cr-vi as corrosion inhibitor. This work has been ongoing for decades studying not only inhibitor alternatives but also other materials.

We now feel confident that a new inhibitor (hereafter named Inhibitor #7) can replace CR-vi in our products, also the ones with higher boiling temperature, with an acceptable expected life time, performance level and safety level.

After the industrialisation of this system for products with low boiling temperature, we now continue the work on the remaining products with higher boiling temperature. As highlighted in previous Reach, RoHS and ELV applications, the challenges are bigger on products with higher boiling temperature. The work proceed however according to plan and we target to have all products with Cr-vi inhibitor phased out during 2025. Therefor we suggest that the exemption for these products could expire at December 2025 in line with the suggested time line for products covered by the ELV directive.

(B) Please provide information and data to establish reliability of possible substitutes of application and of RoHS materials in application

See answer above. Within the analysis of alternatives we are now only considering Inhibitor #7.

7. Proposed actions to develop possible substitutes

(A) Please provide information if actions have been taken to develop further possible alternatives for the application or alternatives for RoHS substances in the application.

See answer 6. above. We only consider Inhibitor #7 as an alternative.

(B) Please elaborate what stages are necessary for establishment of possible substitute and respective timeframe needed for completion of such stages.

Dometic now feel confident in establishing a time plan for substitution of Sodium Chromate. A full scale implementation of the substitute is however not possible before

the existing exemption in RoHS expires on 21 July 2021. To ensure a reliable and safe product we have some further steps to go before a full implementation can be made. In short the following tasks must be finalised:

Finalising and extension of field tests and increased internal testing of some specific models.

Redesign of our cooling units to decrease the boiling temperature and minimising the risk for corrosion inside the tubes. This is an extensive work as we have close to 100 different models of cooling units in production. This task will be partly be coordinated within our regular re-design plan and phase out plan for older models than anyhow needs update.

- Update of the control parameters for the safe guard system monitoring the boiler temperature.

An updated road map on the critical activities is attached in a separate document. Most of these activities are common for products specifically designed for recreational vehicles and consequently within the scope of ELV.

8. Justification according to Article 5(1)(a):

(A) Links to REACH: (substance + substitute)

1) Do any of the following provisions apply to the application described under (A) and (C)?

- Authorisation
 - SVHC
 - Candidate list
 - Proposal inclusion Annex XIV
 - Annex XIV
- Restriction
 - Annex XVII
 - Registry of intentions
- Registration

Remark 1. Reach Authorisation numbers: REACH 17/7/0, REACH 17/7/1, REACH 17/7/2, REACH 17/7/3.

Remark 2. Sodium Chromate (and Sodium dichromate) is registered under Reach by our supplier.

2) Provide REACH-relevant information received through the supply chain.

Name of document: Not available

(B) Elimination/substitution:

1. Can the substance named under 4.(A)1 be eliminated?

- Yes. Consequences? _____
- No. Justification: Products without any corrosion inhibitor stop to operate within months.

2. Can the substance named under 4.(A)1 be substituted?

Yes.

Design changes:

Other materials:

Other substance:

No.

Justification: _____

3. Give details on the reliability of substitutes (technical data + information):

We here refer to previous application (ELV and ROHS) and to the fact that we have now finalised the substitution for our products with low boiling temperatures. No significant issues related to the substitute can be reported.

4. Describe environmental assessment of substance from 4.(A)1 and possible substitutes with regard to

1) Environmental impacts: _____

2) Health impacts: _____

3) Consumer safety impacts: _____

The impact on environment, health and consumer safety for the existing inhibitor Sodium Chromate is well known and documented. The substance is classified as SVHC and is subject for authorisation according to the RECAH regulation.

For our refrigerant including the new inhibitor #7 we have put together an MSDS. This document is attached but considered confidential at this point of time.

⇒ Do impacts of substitution outweigh benefits thereof?

Please provide third-party verified assessment on this: _____

The question is not relevant for Dometic as we have decided to substitute Sodium Chromate.

(C) Availability of substitutes:

a) Describe supply sources for substitutes:

A supplier of Inhibitor #7 is selected and deliver to us for our production of products with low boiling temperature.

b) Have you encountered problems with the availability? Describe: No

c) Do you consider the price of the substitute to be a problem for the availability?

Yes No

d) What conditions need to be fulfilled to ensure the availability?

The supply of inhibitor #7 will follow the processes as for other substances and articles. A supplier is already selected and deliver to us for products with low boiling temperature.

(D) Socio-economic impact of substitution:

⇒ What kind of economic effects do you consider related to substitution?

- Increase in direct production costs
- Increase in fixed costs
- Increase in overhead
- Possible social impacts within the EU
- Possible social impacts external to the EU
- Other: _____

⇒ Provide sufficient evidence (third-party verified) to support your statement: _____

As production with the new inhibitor is now running, the calculation on the increased costs are rather accurate. We consider however this information to be strictly company internal. Furthermore, we refer to information previously given in other applications related to exemptions in ELV and RoHS legislations.

9. Other relevant information

Please provide additional relevant information to further establish the necessity of your request:

10. Information that should be regarded as proprietary

Please state clearly whether any of the above information should be regarded to as proprietary information. If so, please provide verifiable justification:

Please note that it is our request that part of the information we have submitted to you should be considered as confidential, which we have clearly marked at the documents. The material contain business confidential material both of technical and financial nature. If you feel that the exemption cannot be justified on the basis of the confidential information we have submitted please let us know as soon as possible and we will try to find an acceptable agreement for both parties
