Contribution to the Public Consultation on the REACH Restriction Proposal on Per- and Polyfluoroalkyl Substances (PFAS)

Sector: Applications of fluorinated gases

Sub-use: Propellants for technical aerosols for applications where non-flammability and high technical performance of spray quality are required

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Introduction

Our company is an international group based in Switzerland, active in the design, manufacture, and sale of finished watches, jewelry, watch movements, and components. Our group supplies nearly all components required by its watch brands, which in turn supply watch movements (i.e. the mechanism of a watch) and components to third-party watchmakers in Switzerland and around the world.

One company of the group is specialized in the production and commercialization of the regulating parts of the watch (escapements and oscillators), the mainsprings for watches (barrels) and the micro-turned components (rolling and hobbing) that make up mechanical watch movements.

Our company values the opportunity to submit comments regarding the proposed restriction of PFAS under the REACH Regulation. With this contribution, we would like to express our support to derogation 5(z) for propellants for technical aerosols for applications where non-flammability and high technical performance of spray quality are required.

In order to support our request, we are resubmitting the information on the application, expected resulting emissions, the absence of suitable alternatives as well as the negative consequences that an absence of derogation would imply.

Specific Information Requests

Question 1: Sectors and (sub-)uses: Please specify the sectors and (sub-)uses to which your comment applies according to the sectors and (sub-)uses identified in the Annex XV restriction report (Table 9). If your comment applies to several sectors and (sub-)uses, please make sure to specify all of them.

This contribution addresses the use of propellants for technical aerosols for applications where non-flammability and high technical performance of spray quality are required, which falls under applications of fluorinated gases. More specifically, it concerns the use the propellant for the pre-lubrication of escapement wheels.

An escapement is a mechanical linkage in mechanical watches that gives impulses to the timekeeping element and periodically releases the gear train to move forward, advancing the watch's hands. The escapement wheels are generally made of carbon steel with a galvanic nickel layer which rub on ruby pallet stones.

Figure 1 – Escapement wheel

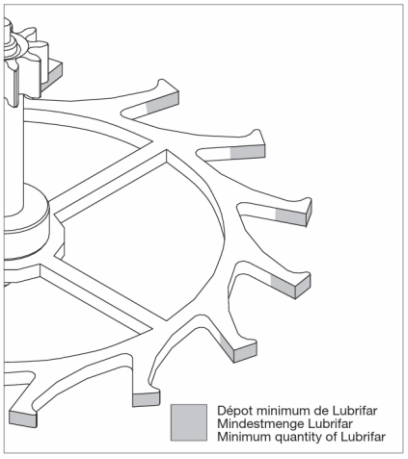
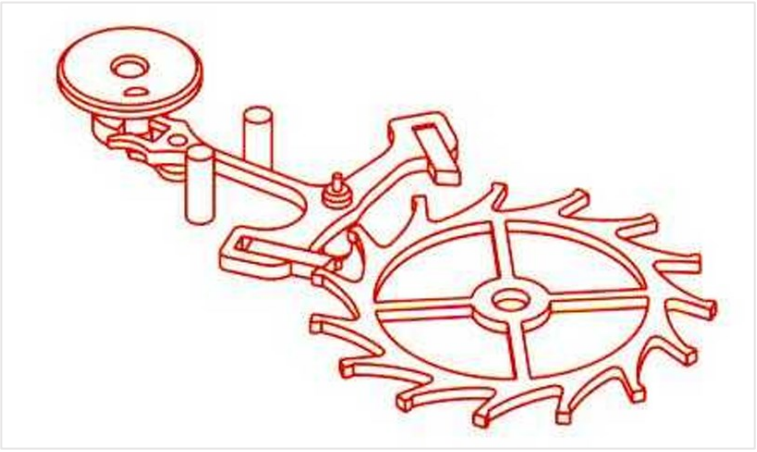


Figure 2 – Escapement with the escapement wheel



In order to ensure the proper functioning of the escapement of a mechanical watch, friction must be minimal. This is achieved by an efficient pre-lubrication of the escape wheels. For this purpose, a PFAS-based propellant is used, mixed with a non-PFAS lubrication oil and Molybdenum Disulfide (MoS_2), and spray the resulting mixture on the escapement wheels. Once the escapement wheels are assembled in the watch movement, the lubrication is completed by the movement manufacturer, usually with a specific escapement grease.

Question 2: Emissions in the end-of-life phase

Please also see answer to question 5.

We would like to underline that there are no PFAS residues in the watch because the solvent evaporates during the micro-spraying of the lubricant mixture. **Therefore, no PFAS residues are present in the articles placed on the European market resulting from this process.**

<u>Question 5</u>: Proposed derogations – Tonnage and emissions:

a) The annual tonnage and emissions (at sub-sector level) and type of PFAS associated with the relevant use.

i. Volumes

- A solvent that contains 10 % (w/w) of Methoxytridecafluoroheptene isomers, REACH N° 01-2129943760-37 is used

800 kg of solvent are used per year, which equal **<u>80 kg of PFAS per year</u>**. This represents 0.00001622-0.00026083% of the total amount of fluorinated gases annually used based on data in Table 3 of the Restriction Dossier, namely 30'671 to 493'173 t per year.

ii. Emissions

The production and application of the lubricant, which takes place in Switzerland, entails the following steps:

1. The mixture of solvent, oil and MoS_2 powder is prepared by dissolving the oil in the solvent and to disperse the MoS_2 powder.
2. The mixture is transferred to a tank equipped with a stirrer.
3. The escape wheel is placed into a polymer cap (to mask most of the wheel, except the teeth) and is put in rotation in front of the micro-spray.
4. The mixture is deposited, by micro-spray, on the escape wheel teeth.

We have made measurements of the level of trans-dichloroethylene in the workshop and the values were well below the limits fixed by the Swiss regulation.

There are no emissions to water, as the preparation is sprayed, and when the mixture cannot be used, it is sent to a specialized waste treatment center.

We would like to underline that there are no PFAS residues in the watch because the solvent evaporates during the micro-spraying of the lubricant mixture. **<u>Therefore, no PFAS residues are present in the articles placed on the European market resulting from this process</u>.**

<u>Question 7</u>: Potential derogations marked for reconsideration – Analysis of alternatives and socio-economic analysis: Paragraphs 5 and 6 of the proposed restriction entry text (see table starting on page 4 of the summary of the Annex XV restriction report) include several potential derogations for reconsideration after the consultation. These are uses of PFAS where the evidence underlying the assessment of the substitution potential was weak. The substitution potential is determined on the basis of i) whether technically and economically feasible alternatives have already been identified or alternative-based products are available on the market at the assumed entry into force of the proposed restriction, ii) whether known alternatives can be implemented before the transition period ends (taking into account time requirements for substitution and certification or regulatory approval), and iii) whether known alternatives are available in sufficient quantities on the market at the assumed entry into force to allow affected companies to substitute.

a) The key functionalities provided by PFAS for the relevant use.

The key functionalities provided by the solvent are the following:

- Non-flammability;
- Capacity to dissolve the lubrication oil contained in the mixture;
- Low boiling temperature (< 50 °C) and high volatility (vapour pressure > 40 kPa at 20 °C) to be used as a spray.

b) The number of companies in the sector estimated to be affected by the restriction.

To the best of our knowledge, our group is the leading watchmaking company offering this lubrication mixture, which constitutes the best method to lubricate escapement wheels, in particular to guarantee a long durability.

Our company supplies the movement manufacturers of our group, which in turn supply to a wide range of watchmakers within the group, as well as outside the group.

c) The availability, technical and economic feasibility, hazards and risks of alternatives for the relevant use, including information on the extent (in terms of market shares) to which alternative-based products are already offered on the EU market and whether any shortages in the supply of relevant alternatives are expected.

The triple requirement of non-flammability, oil solubility and high evaporation rate does not allow the use of other solvents.

Eight different alternatives have been evaluated and tested. None of them could be used either because they did not allow a correct deposition of the molybdenum disulfide and oil based lubricant or because they were not compliant with the security or environmental legislation.

d) For cases in which alternatives are not yet available, information on the status of R&D processes for finding suitable alternatives, including the extent of R&D initiatives in terms of time and/or financial investments, the likelihood of successful completion, the time expected to be required for substitution (including any relevant certification or regulatory approvals) and the major challenges encountered with alternatives which were considered but subsequently disregarded.

As shown by our assessment of alternatives, no alternative without PFAS has been identified at present. In case a suitable alternative becomes available, which is not yet the case, we would need at least 4 years for the industrialization of the deposition and the tests by our customers. For this process, we estimate R&D costs of more than 500 kCHF.

e) For cases in which substitution is technically and economically feasible but more time is required to substitute, information is requested on the following points.

Not relevant, as non-flammable alternatives are not available.

f) For cases in which substitution is not technically or economically feasible, information on what the socio-economic impacts would be for companies, consumers, and other affected actors. If available, please provide the annual value of EU sales and profits of the relevant sector, and employment numbers for the sector.

i. Impact on consumer

There will be a quick loss of reliability of the mechanical watch movements due to insufficient lubrication of escapement wheels, leading to the early obsolescence of watches.

Without a pre-lubrication of the escape wheels, the service life of mechanical watches would be considerably reduced and consumer confidence in these products would similarly drop.

This may lead to a modification of the consumption behaviour of customers towards cheaper and disposable electronic watches, such as products from countries outside of the EU. This while electronics watches, as many other electronic devices, may also require the use of PFAS.

ii. Implications for your company

Since no alternatives have been identified at this stage, the only solution would be to supress pre-lubrication of escapement wheels. The cost would be the loss in turnover for the lubrication treatment on escapement wheels. This amounts probably in the few M€ range.

iii. Annual value of EU sales and profits of the relevant sector

Watches generated €2.44 billion in export revenues for the EU in 2020. In addition, €536 million of EU watch components and straps were also exported to Switzerland in 2020, and watches worth approximately €5.4 billion were imported from Switzerland in 2022. [1]

iv. Employment numbers for the sector

In 2020, the watchmaking industry and jewellery industry and downstream sectors employed 167,000 workers in the EU.[2] In Switzerland, around 61,000 workers are employed in the watch production (including 21,000 cross-border workers, mainly from France, Germany, and Italy).[3]

[1] Federation of the swiss watch industry, 2022.
[2] EuroStat, 2023.
[3] Convention patronale de l'industrie horlogère suisse, 2022.