1st Questionnaire (Clarification Questionnaire)

Request for renewal of exemption 41 *"Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council"*, requested for 5 years

Abbreviations and Definitions

Pb	lead
Stihl	Andreas Stihl AG & Co KG

Background

The Oeko-Institut and Fraunhofer IZM have been appointed within a framework contract[1] for the evaluation of applications for the renewal of exemptions currently listed in Annexes III and IV of the new RoHS Directive 2011/65/EU (RoHS 2) by the European Commission.

Stihl has submitted a request for a new exemption, which has been subject to a first evaluation. The information Stihl has referred has been reviewed and as a result we have identified that there is some information missing. Against this background, the questions below are intended to clarify some aspects concerning your request.

We ask you to kindly answer the below questions until 11 October latest.

Questions

1. You state that you need exemption 41 to be continued beyond 2018 to allow time to confirm the reliability of your devices in the field with a sufficiently high number of products. Please explain your standard quality and reliability assurance procedures including time lines for products with new technologies or when you change design details, components etc. in product series which are already in the market.

   Description of STIHL procedures related to standard quality assurance:

   Any change on products or processes on supplier side need to be applied to STIHL following the **internal standard** "STIHL Werknorm (SWN)" SWN 39001, see confidential attachment.

[1] The contract is implemented through Framework Contract No. FWC ENV.A.2/FRA/2015/0008 of 27/03/2015, led by Oeko-Institut e.V.

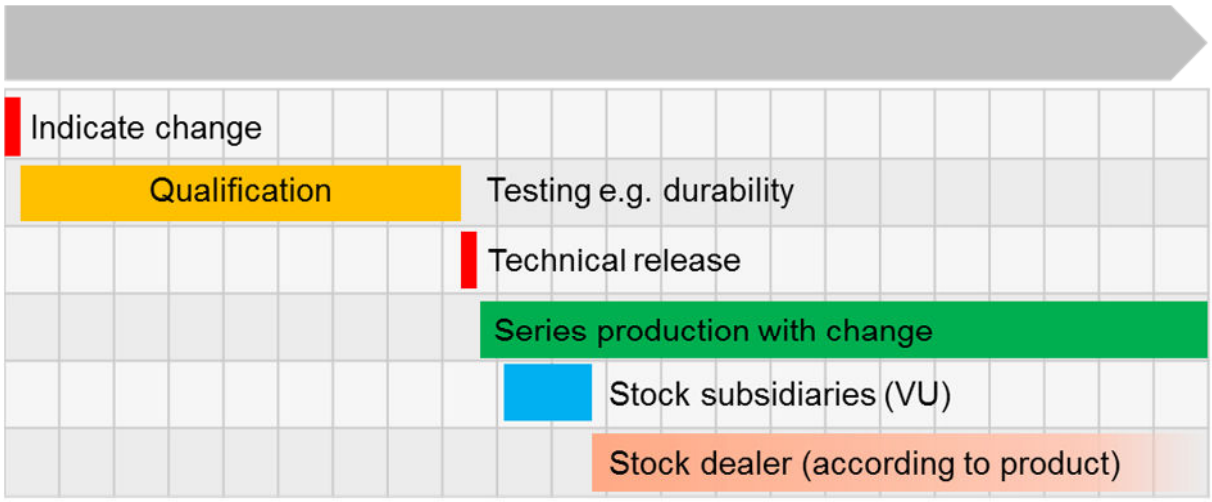
The verification of process and product quality follows our ***STIHL APQP procedure***.

Our APQP procedure is structure into 3 phases:

- 1st phase – Requirement consolidation:
  Drawing and specification review, definition of APQP (advanced product quality planning) profile per material number
- 2nd phase – Quality planning with supplier and test planning:
  Manufacturing feasibility, system/process FMEAs, definition of test-plans, purchase and installation of new test equipment
- 3rd phase – Verification of product quality:
  Process audits, production trial - e.g. Run@Rate, measurement system comparisons, new part evaluation, update test plans, machine capability studies, process capability studies, alignment about documentation.

The duration of these 3 phases is linked to the project milestones and varies from one project to the other depending on the project's complexity.

Typical timeline for technical change:



Dependent on scope of change and corresponding qualification time, it can take up to 5 years until a technical change arrives in the market

For the change to lead-free soldering material, the qualification phase is longer than in the typical case due to the necessity to qualify a sufficiently reliable and durable material for all application cases, i.e. practically all STIHL combustion engines.

The internal requirements for the testing are defined in the internal testing standard SWN 43457-02. An extract of the scope of the testing is listed below. Detailed contents cannot be disclosed. Extract of the content of the internal testing standard.

- Electrical data test bench
- Mechanical design
- Mechanical test
  - Endurance test (load cycle)
  - Field testing

    - Temperature cycle tests
        - Temperature shock in air
        - Temperature shock in liquid
        - Temperature cycles TGD (temperature gradient-test)
        - Long term temperature cycles
    - …
- Function in the engine
- Testing the SW-functions
- Specification of the Software
- …

2. As part of the evaluation, socio-economic impacts shall also be compiled and evaluated. For this purpose, please provide details in respect of the following:

    a. Please estimate possible impacts on employment in total, in the EU and outside the EU, should the exemption not be granted. Please detail the main sectors for which impacts are expected, i.e. manufacturers, supply chain, retail, etc.

    If the exemption will not be granted or only granted for a shorter period of time, this will lead to considerable efforts and costs. Exact values strongly depend on the granted period of time – the main part of efforts and costs being produced in the first years after the current deadline of exemption. Therefore, we expect in any case a socio-economic impact, especially on the supply chain in the EU and beyond.

    To which extend this will affect employment, can currently not be evaluated in a serious way as boundary conditions, like the general market condition at the time, are not clear at the moment.

    b. Is there any generation of additional waste to be expected if the exemption is granted vs. its rejection? If so, please quantify.

    If the exemption will not be granted or only granted for a shorter period of time, this will lead to a waste of precious resources (material, energy, work force) and to environmental pollution (exhaust fumes from transportation and waste burning, etc.).

    - Waste: Ignition control modules and similar devices need to be sealed with epoxy resin and therefore cannot be recycled.
      → We estimate 50 to 100 tons of complex lead containing waste.
      → We estimate the lead content in the waste of several hundred kilograms.
    - Energy will be wasted for transportation, waste scrapping, rework of machines, etc. The same steps will produce unnecessary environmental pollution (exhaust gases, waste residues in soil and water, etc.)
    - Work force is wasted for reworking machines.

    If the exemption is granted, the waste of material, energy and work force mentioned above will be avoided.

Please note that answers to these questions are to be published as part of the available information relevant for the stakeholder consultation to be carried out as part of the

evaluation of this request. If your answers contain confidential information, please provide a version that can be made public along with a confidential version, in which proprietary information is clearly marked.