

**Development of Ecodesign and Energy Labelling implementing measures for High Pressure Cleaners**

**Stakeholder consultation
 Professional HPC – Questionnaire on Technologies**

**June 2018**

The data that you provide will help us better understand current the technological progress; and your approach to environmental performance; life cycle aspects and improvement potentials/opportunities for **Professional High Pressure Cleaners**.

The answers received to this consultation are an important element of our work. Your time and expertise are greatly appreciated and valued. Please feel free to forward this document to other stakeholders whom you consider would have a potential interest. Please do not feel obliged to answer all questions. Should you require any further information in order to complete this questionnaire, please do not hesitate to contact us.

Thank you in advance for your support.

**You are invited to submit your feedback to:**

JRC-B5-HIGH-PRESSURE-CLEANERS@ec.europa.eu

Rocio.RODRIGUEZ-QUINTERO@ec.europa.eu

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**Dear Stakeholders,**

Please find below questions that will aid the team carrying out the preparatory study to obtain a better understanding, and to document the status, the technological progress related to life cycle aspects and improvement opportunities for **Professional High Pressure Cleaners**. We would appreciate your feedback to the project team in any form you prefer, also with attached documents and supporting information. Please do not feel obliged to answer all questions.

**Question 1 – In house test methods on cleaning efficiency/performance**

Do you have in-house testing methods to measure and assess the cleaning efficiency/performance, consumption of energy, water and consumables and power draw of your HPC products? If yes, please provide us with information of these test methods and procedures.

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| **Answer:** Yes/No e.g. Attachment 1,2 |

**Question 2 – Representative products for Professional HPC**

In order to assess and to model each HPC category separately, representative (average) products will be used as benchmark cases. Based on your expertise, could you suggest representative products for each category of HPC? Could you send us the technical characteristics (e.g. pressure, flow rate, motor effect) and/or brochures, technical factsheets etc. of these products?

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| * Cold water HPC single/three phase
* Hot water HPC single/three phase
* Cold water combustion engine
* Hot water combustion engine

**Answer:** Yes/No e.g. Attachment 1,2 |

**Question 3 – Basic differentiations of Domestic versus Professional HPC**

Could you propose to the investigation team which technical limits or properties you think would be relevant to differentiate domestic versus professional HPC (e.g. power and/or maximum flow and/or maximum pressure)? Which design features, performance parameters etc do you consider differentiate domestic versus professional HPC (e.g. in the materials selection, etc)

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| **Answer:** Yes/No e.g. Attachment 1,2 |

**Question 4 – Bill Of Materials (BOM)**

Could you send us a representative BOM for the product categories noted in Question 2? Below we enclose a table with the main components and materials we have noted until now. Please add, correct and/or send a new BOM when relevant.

| Component | Professional mobile  | Amount (g) or % of weight |
| --- | --- | --- |
| Motor/pump assembly* 1. Motor
	2. Water pump & piston chamber
	3. Housing
 | a. Steel, cast iron, aluminium sheet/extrusion, copper winding wire | Steel: xxx gCast iron: xx g |
| b. Cast iron, stainless steel |  |
| c. ABS |  |
| Water inlet | PP |  |
| High-pressure hose | HDPE, copper wire, aluminium sheet/extrusion, ABS |  |
| Cleaning attachment (i.e. lance) | ABS, steel sheet |  |
| Detergent hose and tank | HDPE |  |
| Fuel tank with burner | ?? |  |
| Casing | ABS, HI-PS, steel sheet |  |
| Wheels | PP |  |
| Safety components | ABS, CuZn38 cast (brass) |  |
| Integrated circuit board | IC's avg., 5% Si, Au |  |
| Packaging | LDPE, cardboard |  |
| TOTAL WEIGHT OF PRODUCT (g) |  |

**Question 5 –Product lifetime**

What is the design lifetime of each of the product categories in Question 2?

Do you have information on the critical parts that most often fail? And do you have information on repairability/ ease of repair (possibly including manuals/ instructions/ flowcharts/ diagrams)?

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| **Answer:** Yes/No e.g. Attachment 1,2 |

**Question 6 –Energy and water measurements**

Could you send us energy and/or power and water measurements during use, per HPC category in question 2? For example, energy consumption during use for full load or maximum flow rate; for 50% load; for rotating nozzle and during standby or other low power mode.

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| **Answer:** Yes/No e.g. Attachment 1,2 |

**Question 7 –Technological progress and Best Available Technologies (BAT)**

In the preparatory study we would like to document the latest technological progress of professional HPC and to quantify their effect in terms of energy and water savings or product lifetime extension. BAT will aid in differentiate the better performing products in each category. Could you please comment on the progress of **professional HPC** regarding following **9 technological areas listed below**? Please note some items are indicative, are used only as examples-inspiration from other product groups.

Could you provide supporting information-documentation of the technological innovation per thematic area? What are the benefits? Is any of the listed items relevant for HPC, and if yes could you provide some details?

**7.1 Technology area 1 – Energy efficiency**

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| **Examples*** Energy efficient water pumps
* Motors with variable speed drive / Variable power motors
* Environmentally friendly burner boilers / Boilers with electric preheating systems
* Improved thermal insulation of heated parts
* Motors efficiency (also of Brushless DC Motors)
* Waste heat from motor used as part of water heating (for hot water HPC)
* Motor/pump only operates when the spray lance is operated
* Weight reduction of heated parts

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.2 Technology area 2 – Sensors and automatic controls**

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| **Examples*** Automatic detergent dosage systems
* Leakage control
* Automatic control of important parameters
* Eco-modes / Mode selection – optimisation of pressure/flow/detergent for specific cleaning task
* Electronic temperature control
* Self-diagnosis systems
* Temperature stabilisers
* Enabling default to low-power mode, and stages/ timing involved (see also Technology area 6)
* Pressure and/or flow regulation

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.3 Technology area 3 – Spraying technology and benefits**

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| **Examples*** Improved nozzle designs e.g. high-pressure nozzle as a concentrated jet
* Rotary nozzles
* Nozzles with different spray patterns

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.4 Technology area 4 –Materials selection**

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| **Examples*** Use of recycled plastic
* Materials that increased the lifespan of critical component (e.g. ceramic valves)
* Critical components identification
* Optimal materials per component?
* Ceramic components for increased resistance to wear, corrosion, soap, acids etc
* Stainless steel internal components / ceramic valves - pistons / brass head.
* Environmentally-friendly detergents
* Use of recycled materials or re-used components (and potential in-house checking procedures to verify that they are still fit for use)
* Avoidance or reduction of use of "Critical Raw Materials", as defined by the European Commission

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.5 Technology area 5 – Consumer feedback mechanisms**

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| **Examples*** Displaying detergent dosage recommendations
* Indication of water and energy consumption during use

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.6 Technology area 6 – Low power modes**

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| **Examples*** Automatic shut down if idle for some time
* Energy measurements during standby/idle mode

**Answer:** Yes/No e.g. Attachment 1,2 |

**7.7 Technology area 7 – Maintenance and durability aspects**

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| **Examples*** Modular build up designs[[1]](#footnote-1) / Easy access to all components.
* Is pump & valve easy to access for maintenance and/or repair?
* Weather-wear-corrosion-chemical resistance of critical components
* Damages caused by hard water
* Water seals

**Answer:** Yes/No e.g. Attachment 1,2 |

**Question 8 –Best Not yet Available Technologies (BNAT)**

Do you have any collection system of old high pressure cleaners which are ready to be disposed of (i.e., "reverse logistics" collections)? If not, who makes the collections, sorting and disposal? Is it, for example, the local authorities?

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| **Example[[2]](#footnote-2)** Additive Manufacturing or 3D printing**Example[[3]](#footnote-3)** Internet of Things (IoT) **Answer:** Attachment 1,2* Technology 1
* Technology 2
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**Question 9 – End of Life treatment**

Do you have any collection system of old high pressure cleaners which are ready to be disposed? If not, who does the collection, sorting and disposal, the local authorities?

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| **Answer:**  |

Please also feel free to forward this document to other stakeholders whom you consider would have a potential interest. Should you require any further information in order to complete this questionnaire, please do not hesitate to contact us.

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On behalf of the HPC project team

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1. *European Environmental Agency Report, No 6/2017 – Circular by design, Products in the circular economy. ''Modular design is still a very small, niche trend. Nevertheless, if this trend grows, it could extend product lifetimes by enabling the remanufacture and repair of product components. In the business-to-consumer market, the impact of modular design on product circularity depends on the role of modularity in the business model. Modular design might render products more easily repairable, but replacement parts and/or services need to be available to the user or repair service provider. Likewise, by enabling changes in a product to refit it to the changed needs of the user, or to the different needs of the next user, modularity could increase the lifetime of the product's basic structure, but not necessarily its components.''*  [↑](#footnote-ref-1)
2. *European Environmental Agency Report, No 6/2017 – Circular by design. Products in the circular economy ''3-D printers could be used for printing spare parts, so that companies could reduce the spare part stock and warehousing, or that consumers could use these techniques to repair products themselves''* [↑](#footnote-ref-2)
3. *European Environmental Agency Report, No 6/2017 – Circular by design, Products in the circular economy ''IoT enables products to be tracked for location, status and quality, and to be remotely controlled in unprecedented ways. For example, this interconnectedness of devices allows the efficiency of product use to be monitored, and facilitates the predictive maintenance of products in ways that were previously inconceivable. In addition, it enables actual consumer patterns and needs to be tracked, vs the predicted needs and use patterns which were envisaged at the moment of designing the product.''* [↑](#footnote-ref-3)