



# WP1 – SPECIFICATIONS AND END USER REQUIREMENTS



## ABSTRACT

Main task objectives:

- To specify end user requirements from different manufacturing sectors and provide related specifications in terms of materials, additives and production
- To define laser related requirements
- To specify test cases and test planning for validation

Part Sheet		Item:	2020/0219	
Title:		Rev:	00000000	
<p><b>Part Sheet</b></p> <p>Washing group tub shells - ELECTROLUX/FINJA</p> <p>Item number: 2020/0219</p> <p>Revision: 00000000</p> <p>Function: Clean the drum and the water to perform the laundry washing process</p>				
<p><b>Description:</b> The two tub shells (front and rear) are welded (or screwed) together to guarantee the resistance to water leakage during the washing process. The joint process is automatic and performed along the assembly line.</p>				
<p><b>Current technology:</b> Hot plate welding - Screwing (limited)</p>				
<p><b>Main assembly problems:</b> The process is not flexible, not completely reliable (especially the screwing area), not user friendly and energy costly</p>				
<p><b>Objective:</b> Introduce the laser technology to increase product quality, flexibility in washing different washing groups (and in particular when new models are designed and manufactured) and reduce, if possible, the welding cycle time</p>				
Material	Composition Material A	PP + 40% CaCO <sub>3</sub> + additives (conditioners and colorants)	Surface finishing	cleaned from burrs
	Composition Material B	PP + 40% CaCO <sub>3</sub> + additives (conditioners and colorants)	Crafting	NA
Mechanism thermal loads	Temperature	NA	Transmission	NA
	Shock	NA	Scuffing	NA
Typical properties	Modulus	NA	Friction welding quality	Fracture: consistency
	Strength	NA	Fracture: consistency	Fracture: consistency
Geometry	Max. Min. dimension	300x100x100 mm	Fracture welding quality	Best job coupled with the rear tub
	Max. Min. weight	1.5 kg	Fracture welding quality	Fracture: consistency
<p><b>Machine Sheet</b></p> <p>Item: 2020/0219</p> <p>Rev: 00000000</p>				
<p><b>Description of process:</b> The two tub shells (front and rear) are welded (or screwed) together to guarantee the resistance to water leakage during the washing process. The joint process is automatic and performed along the assembly line.</p>				
Process requirements	General	<p><b>Flexibility:</b> Adaptability and automatic adjustment capable to weld different type of components with high quality and precision</p> <p><b>Accessibility:</b> Easy to access for maintenance and repair</p> <p><b>Safety requirements:</b> Respect of all LHD EN directives</p>	<p><b>Machine interface:</b> Easy to integrate in an existing plant</p> <p><b>Process monitoring:</b> High quality check and process control (if possible) feedback generation, laser process power, time, etc.</p>	
	Dimension	<p><b>Speed of use:</b> + current cycle time if possible</p> <p><b>Changeing devices:</b> Intelligent, adaptable to various components to weld</p> <p><b>100% production:</b> Yes</p> <p><b>Max. Min. dimension:</b> Actual welding cell dimension 1000x1000x1000 mm min</p> <p><b>Max. Min. weight:</b> NA</p>	<p><b>Setup process:</b> Adaptive and cleaning control</p> <p><b>Half controlled:</b> Yes</p> <p><b>Modular machine:</b> Capable to integrate in existing part of the cell and to modify the welding process according to the component to be welded</p> <p><b>Low setup:</b> Yes</p> <p><b>Cost:</b> Initial investment: complete hot plate welding cell + 20000€ of consumption + 50000€ of maintenance cost</p>	

Questionnaires to collect information



Parts and basic test samples

## METHOD

Methodology in order to collect information from the end-users:

- Telephone conferences and mailing to share information and track activities.
- Questionnaires to end users and developers to collect data for requirements and specification concerning industrial field, current products, materials in use, future needs of materials, product design.
- Meetings to discuss and specify in detail the end users needs and requirements in terms of products, materials, pigments, process, test samples and validation criteria

## HIGHLIGHTS

Each end user has defined one or more parts that represent their needs and goals for this project: reduce cycle time of the process while maintaining the quality of the Parts by using a safe, flexible and cost effective technology.

Basic test samples have been defined in order to analyze the interaction between laser and materials (like PP, PA66 etc) with different type of fillers (glass fibres, CaCo3, etc.) and different pigments.

An evaluation criteria has been defined for each industrial application and a test plan based on the definition of process requirements has been generated.

## OUTLOOK

- Relevant information in terms of specification of products, processes, and evaluation criteria could be consulted in the deliverable "Guidelines for suitable material combinations and joint geometries".
- Some of the selected products or specifications have been updated during project duration

## CONTACT

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