



## Development of new UV laser for customization at industrial level through high quality marking on different materials (UV-Marking)

<b>Programme area:</b>	FP7-2012-NMP-ICT-FoF Factories of the Future
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<b>Website:</b>	<a href="http://www.uv-marking.eu">www.uv-marking.eu</a>
<b>Duration:</b>	01/07/2012 – 30/06/2015
<b>Budget:</b>	€6.102.334 (EU contribution: €3.657.000)
<b>Contract number:</b>	314630

### Summary

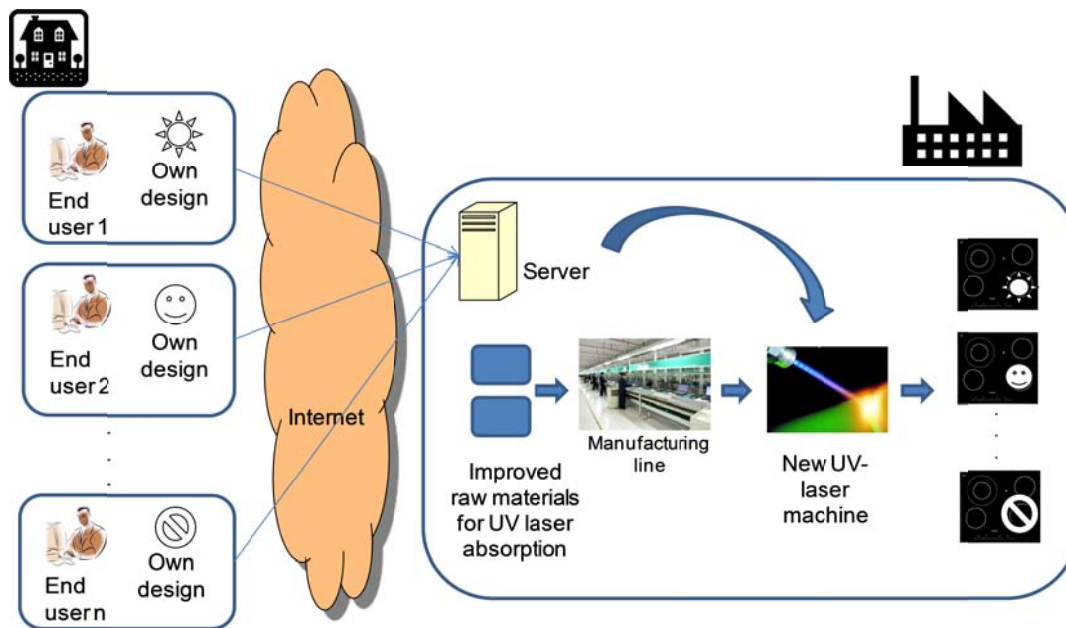
The **main objective** of this project is to develop a **new laser system in the ultraviolet wavelength** used for **high quality aesthetical marking in different materials** (glass-ceramic, ceramic and plastics). In order to maximize the project results, the project will work not only in the UV-laser system, but also in the improvement of existing materials for having a better beam absorption in the UV range.

Other important goal is to demonstrate that **unitary customization** will be possible at the end of UV-Marking project. A new SW application will be developed so that real customers

can create their own designs at home, and send them to the factory to be marked in real products.

Finally, **Industrialization** is a must, and therefore the laser system will be integrated into an industrial process to demonstrate its feasibility in a real scenario.

The final concept of the project is shown in the next figure:



## BACKGROUND

As well as in many industrial sectors, most of the printing and marking processes in the home appliance sector are based on fixed moulds and templates, and they must be done at an early stage in the manufacture line, before the assembly. These rigid processes encounter difficulties to be applied on certain conditions and materials, have high cycle times (mainly when changing models), make use of additives that could be environmentally unfriendly, are not energy efficiency processes, etc. Such is the case of tampon printing, or silk screen printing. Thus, in terms of costs, flexibility, quality, delivery time, service, etc. it is not assumable nowadays to think about unitary models.

## Expected Impact

The project aims at bringing UV-laser advantages for aesthetic marking into production of European key industries, by improving both materials and UV laser systems. The project

results will introduce high flexibility as it will be possible to mark at the end of a process. This will reduce stock levels (of similar pieces only with aesthetic differences), increase marking options for customization, reduce time to market of new and modified products, improve quality, delivery time, etc.

In terms of European laser industry, which is the most important over the world, this project will contribute to maintain this status. For other industrial sectors, European manufacturers suffer the global market pressure and they need products differentiation in order to strength their market shares (aesthetical differentiation, value added products, new performances, ...). This requires strong R&D efforts by European enterprises, and in order to optimise these efforts, a strong European consortium has been created within this project.

## Consortium

The UV-Marking consortium is formed principally by industrial partners. It covers the whole value chain of UV-laser marking with high level experienced entities. The consortium gather the principal industrial actors involved in marking: final user (BSH), laser developer (ROFIN), material and additives developers (ILVA, TORRECID, WIRTHWEIN, MERCK), a research centre expert on both material and laser giving scientific knowledge of the laser-marking process (ICMA), and a software developer expert on industrial integration software (U-Marq). The consortium has been built searching expert enterprises on each field, and it was needed a European approach to join all of them.

In summary, the role of each partner is shown below. BSH, one of the most important companies of the home appliance sector, will lead the project. They are the perfect validators because they use high variety of materials and aesthetics for commercial purposes is very important for them. ROFIN will be the laser developer, which is a leader company in this sector. U-MARQ is an ICT company that will work in the software for the integration of the laser in the industrial process, and the user application; WIRTHWEIN and MERCK are leader companies and will work with plastic materials to improve the absorption properties and to obtain concrete colors different than black or white. ILVA and TORRECID will work in the field of glass and ceramic materials. Finally, 3 different groups of ICMA (from University of Zaragoza and CSIC) will participate as experts on laser and materials.



B/S/H/	BSH	→ Requirements and validation
rofin	ROFIN-SINAR	→ Laser developer
MERCK	Merck KGaA	→ Pigments developer
WIRTHWEINAG	Wirthwein AG	→ Plastic molder
	Torrecid	→ Ceramic developer
ILVA	ILVA	→ Glass-ceramic manufacturer
icma	ICMA	→ Laser-Material Interaction research
U-MARQ	UMarq	→ Application software