CANUNDA
BY CAILABS

CASE STUDY

NCLA optimizes its **laser micromachining processes** with CANUNDA-SPLIT

The partner

The **National Centre for Laser Applications (NCLA)** is a research center at the National University of Ireland, Galway, which is focused on laser materials processing research and development with the aim of developing innovative industrial solutions.

The application

Micro-drilling and micro-milling are common tasks performed by industry. Ultra-short pulse lasers greatly improve these processes and are therefore experiencing a growing interest from manufacturers.

The issue

NCLA is working to develop solutions to **improve the performance of micro-drilling and micro-milling processes using ultra-short lasers**. Parallel machining is one of the most promising solutions, but it requires a beam splitting technology that is compatible with these high power lasers.

The CANUNDA-SPLIT solution

CANUNDA-SPLIT is a **beam splitting module** which can be used for parallel machining. With its **fully reflective design**, this module can handle high energy femtosecond laser pulses with stability. CANUNDA-SPLIT makes it possible to select different beam splitting patterns (number of spots, etc.). This solution can also be **easily integrated** in an industrial environment.

Key performances of CANUNDA-SPLIT

High-quality beam shaping
> 96% beam homogeneity
High-quality sub-beams

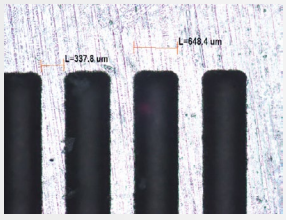
An industrial solution
Compatible with **galvo scanners**
Preserved shape in the full field of view of the F-theta lens

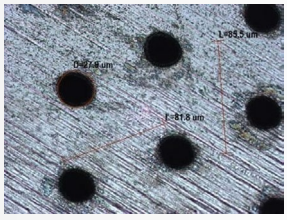
For an improved process
42% increase in micromachining rate
Laser power fully exploited
Production costs reduced

"CANUNDA-SPLIT produces high quality uniform beam splitting in a galvo configuration. For processing of periodic features, it enables much increased throughput particularly for micromachined periodic features where a large number of motion paths are required."

Alan Conneely
NCLA Centre Manager

Turn the page to find out more about the **process results**





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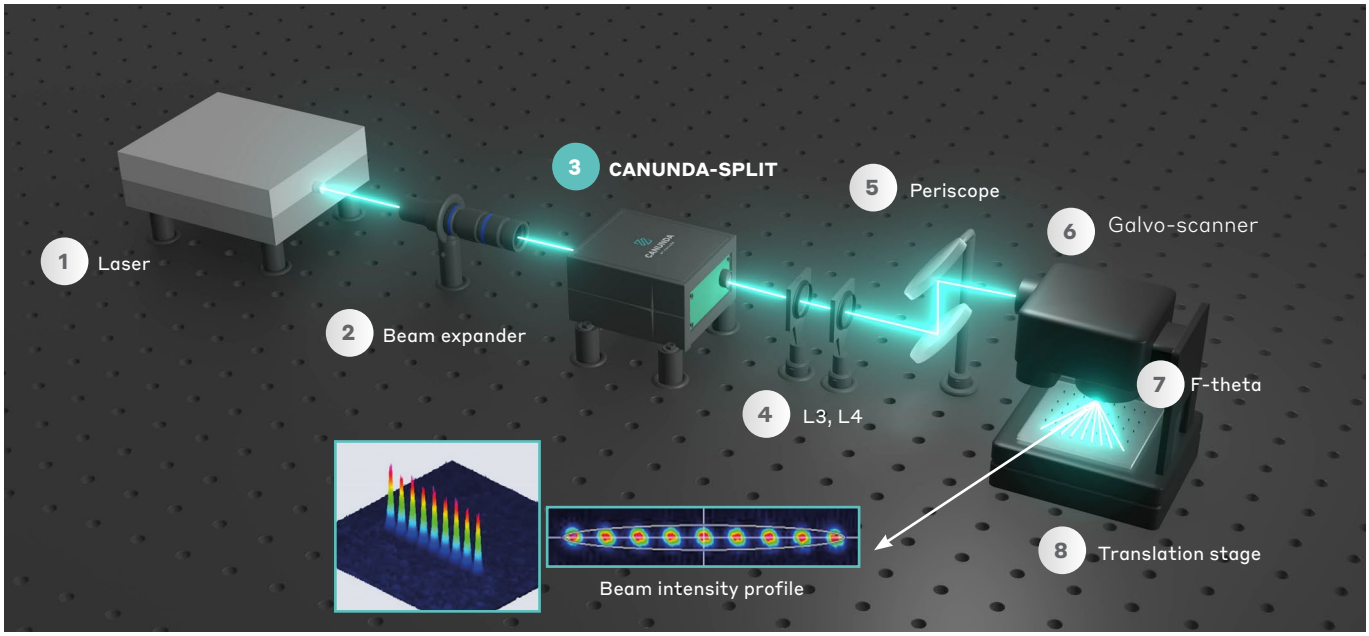
SHAPING THE LIGHT

Industrial integration of CANUNDA-SPLIT

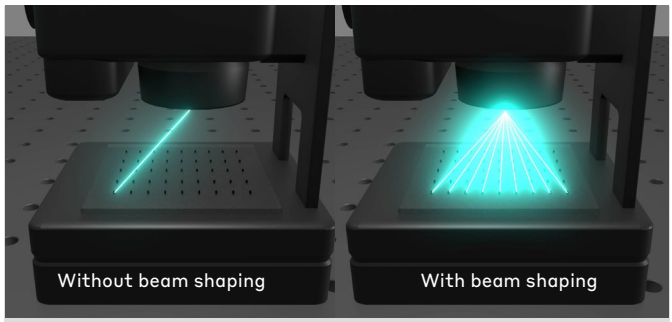
CANUNDA-SPLIT was used at NCLA's premises on an optical bench to perform micro-drilling and micro-milling on stainless steel.



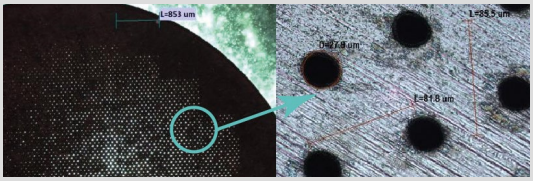
CANUNDA-SPLIT was used to split a single input beam into 9 individual sub-beams with a 17 µm waist on the working plane, each spaced 80 µm apart.

Laser	
Laser type	Trumpf Trumicro 5050
Wavelength	1030 nm
Power	50 W
Energy per pulse	125 µJ @400 kHz
Pulse duration	< 10 ps

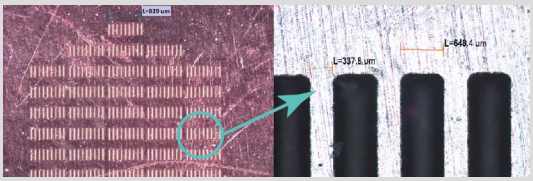
Set-up	
Galvanometric scanner	Scanlab Intelliscan 14
F-Theta lens	Telecentric 100 mm
Product reference	CASP-P01-1030



+42% **Micromachining rate**
With beam shaping



8,400 holes drilled in 58 seconds at a repetition rate of 40 kHz



774 features milled in 95 seconds at a scanning speed of 60 mm/s

About Cailabs

Cailabs was established in 2013 in Rennes and is a French deep-tech company which designs, manufactures and sells photonic solutions.
By combining our state-of-the-art beam shaping technology (Multi-Plan Light Conversion or MPLC) with optimal engineering, we create innovative products that help solve some of today's major industrial and technological challenges for multiple applications, including laser machining processes with the CANUNDA product line. It improves the quality and efficiency of laser processes through unique beam shaping (laser cutting in the smartphone industry, micro surface structuring to improve paint adhesion on metal, and replacing metal chemistry processes).

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SHAPING THE LIGHT
1 rue Nicolas Joseph Cugnot
35000 Rennes - France
www.cailabs.com
canunda@cailabs.com