

+GF+

GF Machining Solutions

Laser Hand Made

Djemel Dellouche / Surftherm 13.11.2018

GF Piping Systems



40%

CHF 1'678 million

GF Casting Solutions



36%

CHF 1'482 million

GF Machining Solutions



24%

CHF 992 million

Nombre total d'employés 2017: 15'835

CA en 2017: CHF 4'150 million

AGIE

CHARMILLES



MIKRON®

system 3R



992

million (CHF) sales

3 003

employees

35

companies worldwide

Texturisation Laser

- Texturisation
- Structurisation
- Gravure

Microlution

- Micro Découpe Laser
- Micro Perçage Laser
- Micro Tournage Laser

Impression 3D Métallique

- DMLS Lit de poudre
- Cladding
- 3D Systems

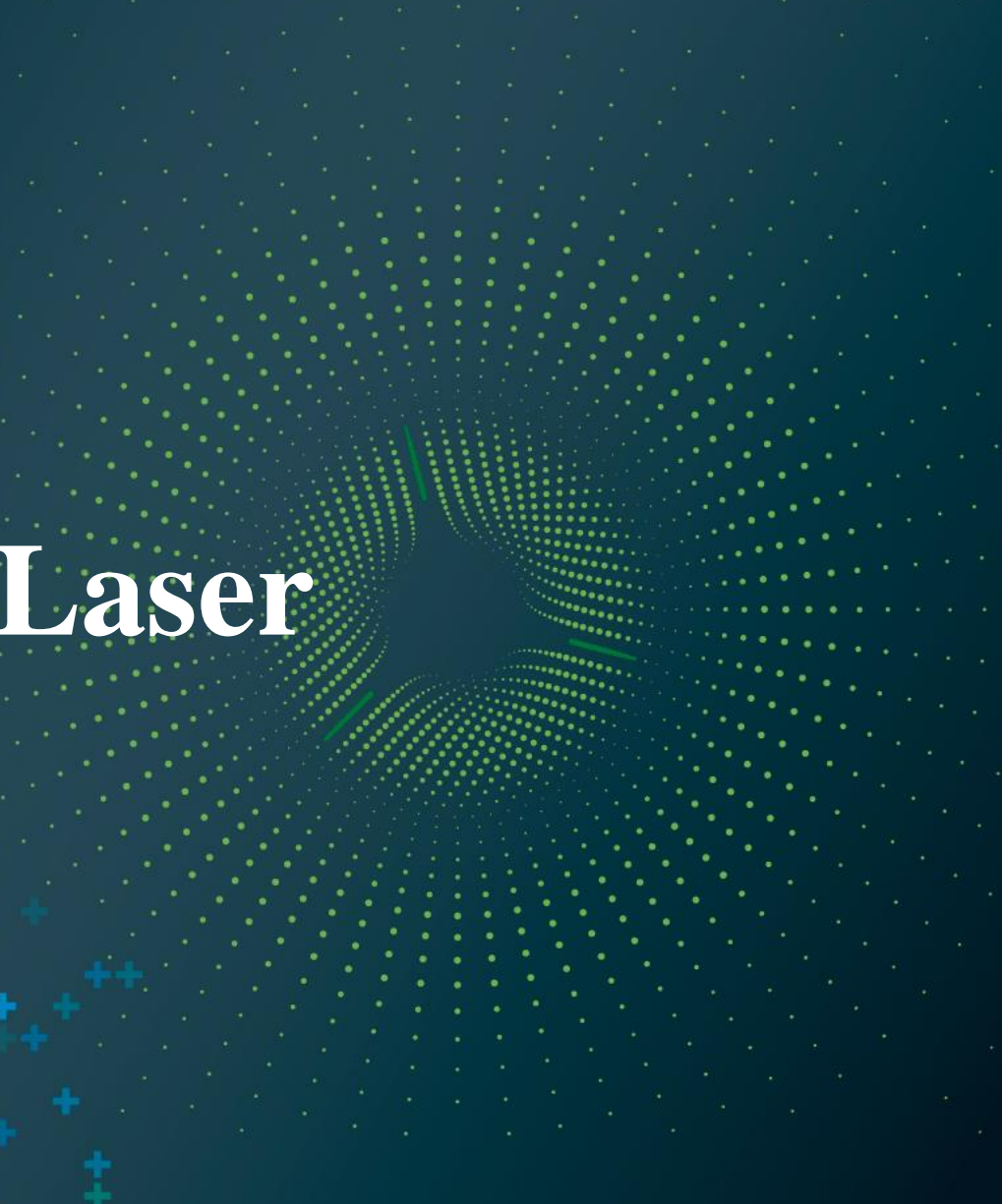


“QUALITY ? PRODUCTIVITY ? HERE IS YOUR SOLUTION”

+GF+

Surftherm 2018

Texturisation Laser



Texturisation Laser

Gravure / Usinage / Texturisation / Structurisation



Texturisation / Structurisation / Usinage

Orientation Parfaite /
Structure contrôlée

texturing

Usinage 3/5 axes

Sablage Laser Structurisation de surface

**SABLAGE LASER
SELECTIF**

Charmilles de 14 à 45



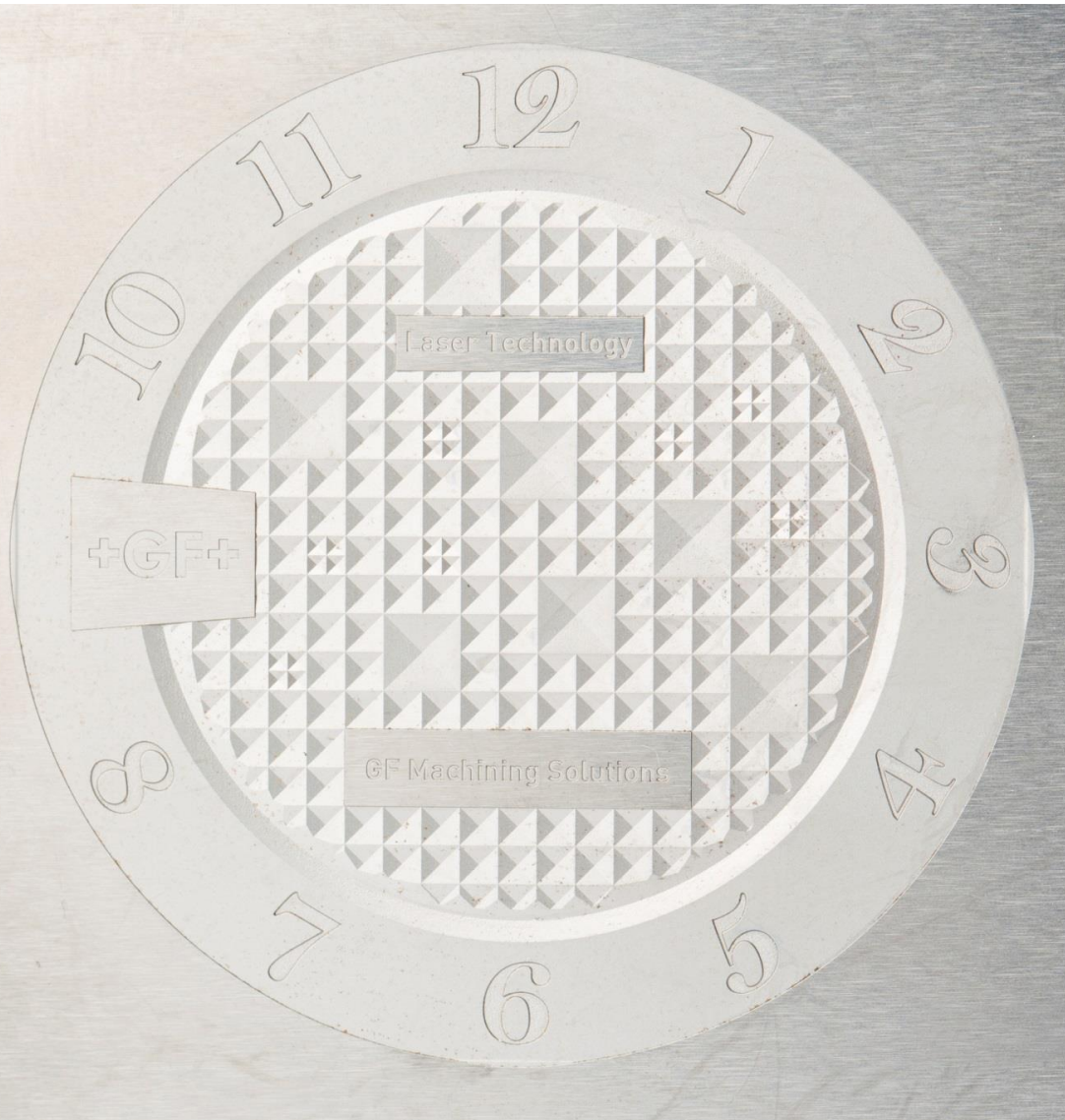
Laser Texturing

Révolutionnez la tradition horlogère

MATRICE D'ETAMPAGE POUSSEZ LES LIMITES DU DESIGN



MATRICE D'ETAMPAGE POUSSEZ LES LIMITES DU DESIGN



MATIERE Acier K40500

TEMPS D'USINAGE 268 heures

CLASSIFICATION 3D Down Ramot HR

MACHINE UTILISEE DP400U

SURFACES TRADITIONNELLES FAIT MAIN GRACE A LA TECHNOLOGIE

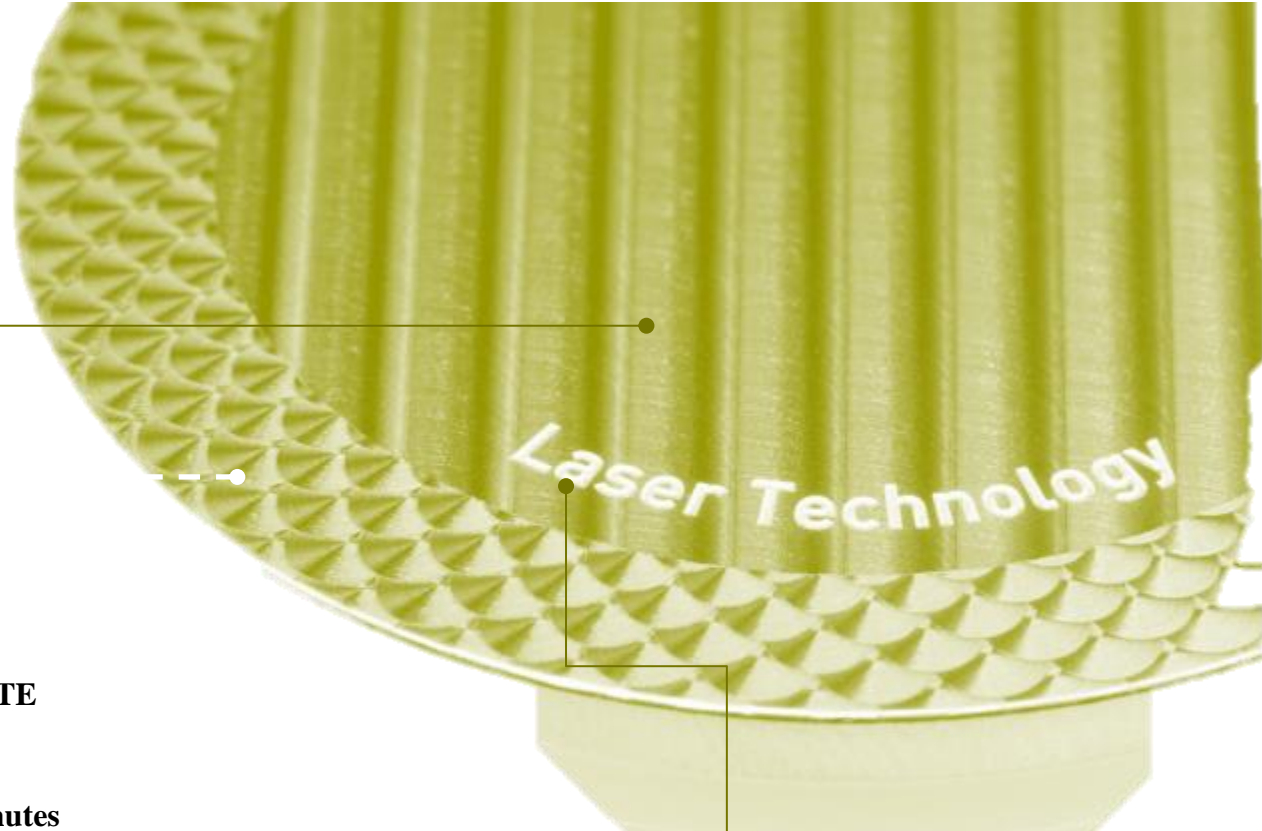


MATIERE Laiton

TEMPS D'USINAGE 38 minutes

LASER UTILISE 20W Femto IR

MACHINE UTILISEE LP 400U



DECORS TRADITIONNELS DE QUALITE

PRODUCTIVITE Réalisé en quelques minutes

DIGITAL Pas d'erreurs / 100% Répétable

PROCHE DU REEL Hand made by Laser

CAPACITES DE GRAVURE PARFAITE

PROPRE Plus que la gravure chimique

RESISTANT à la corrosion et au temps

PRECISION Gravure de lettrages

NOUVELLES POSSIBILITES DE MATERIAUX TECHNOLOGIE DE POINTE

+GF+

MATIERE Saphire

TEMPS D'USINAGE 3 minutes

LASER UTILISE 20W Femto IR

MACHINE UTILISEE LP 400U



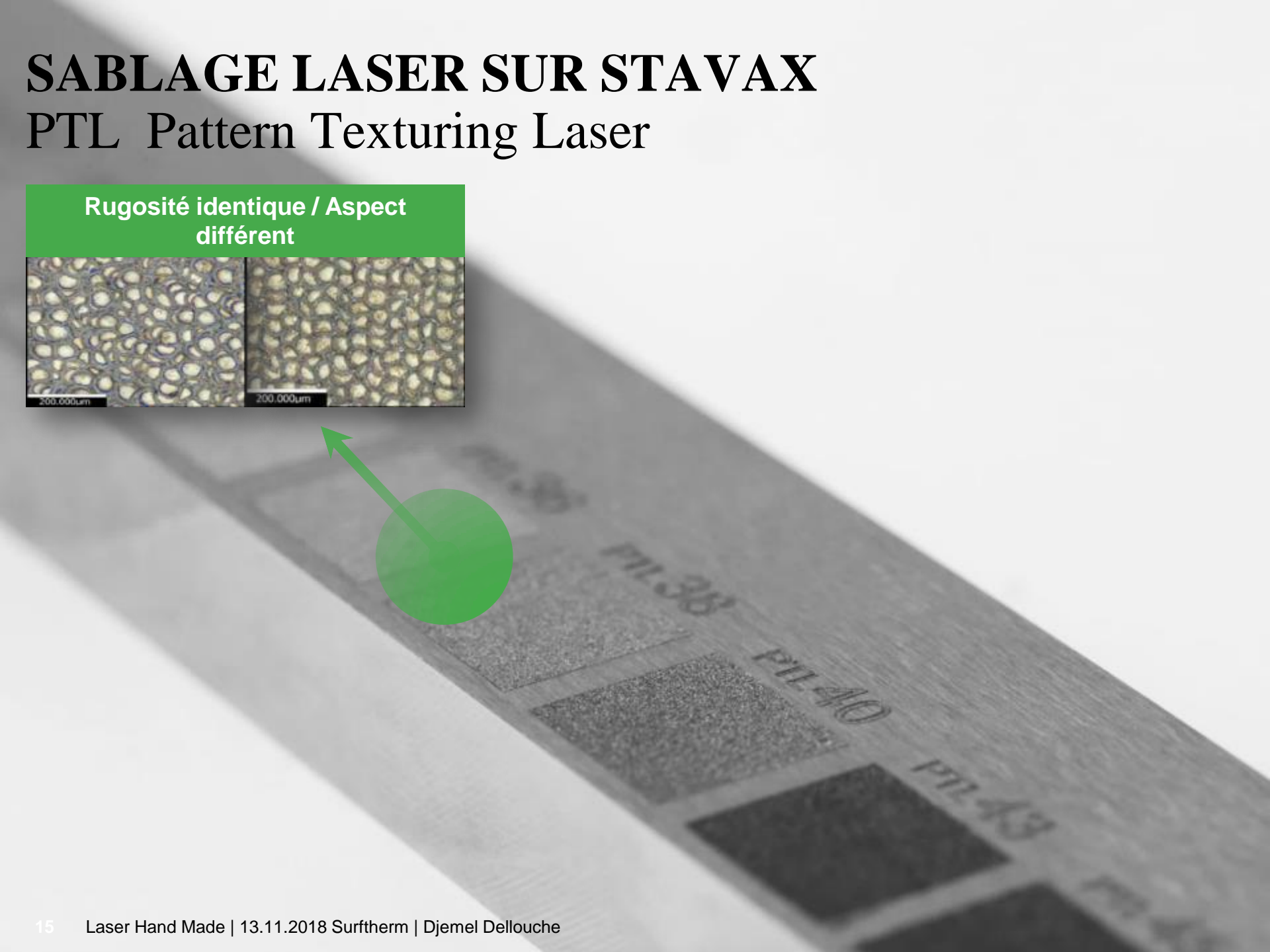
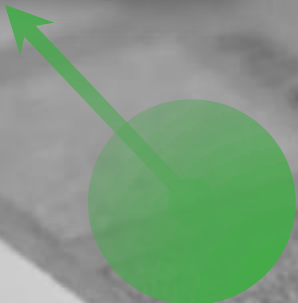
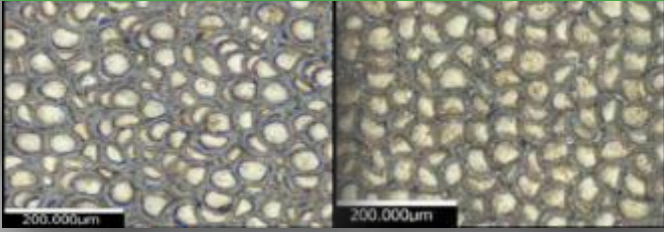
Structuration de surface

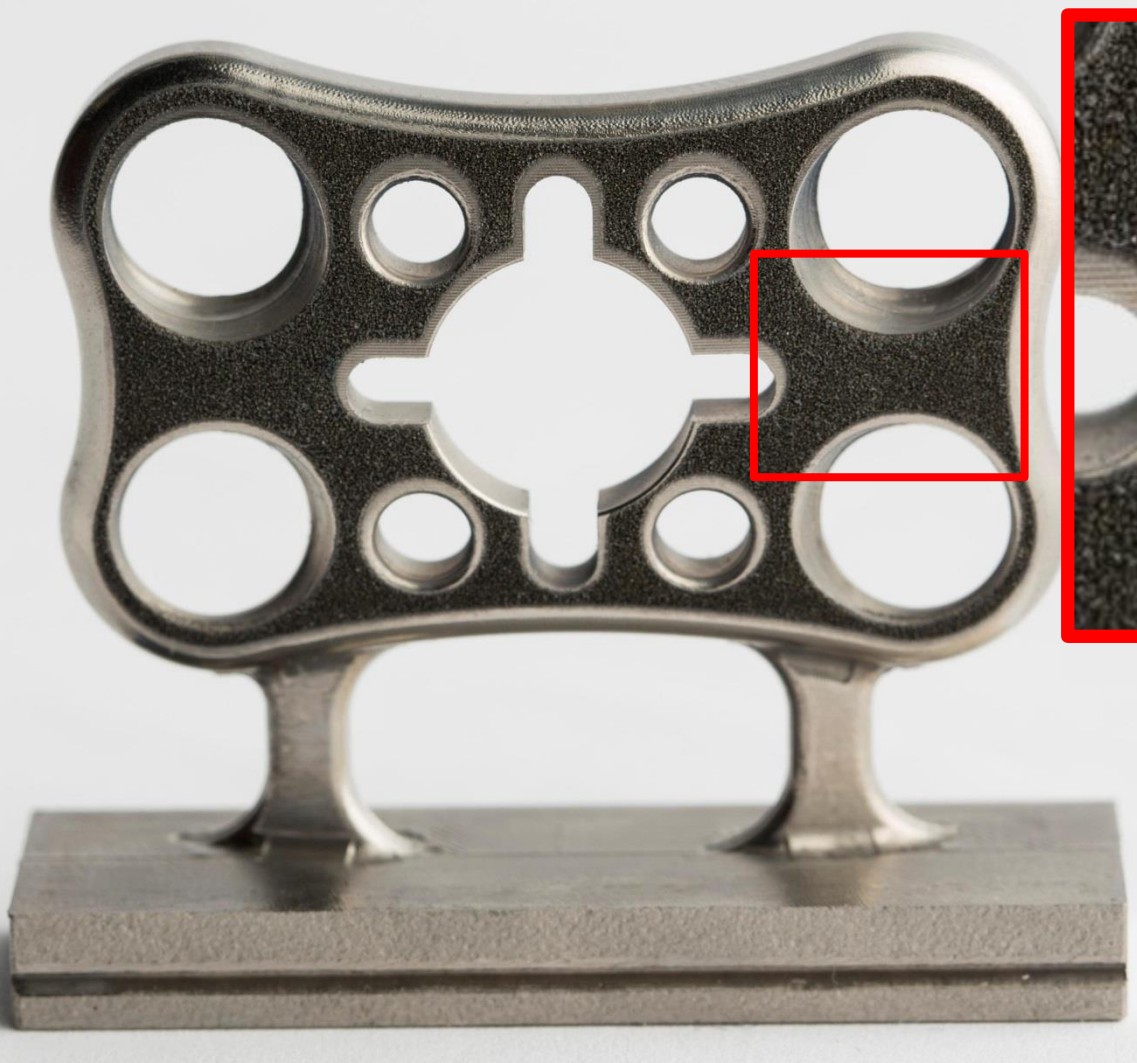
Surfaces fonctionnelles

SABLAGE LASER SUR STAVAX

PTL Pattern Texturing Laser

Rugosité identique / Aspect différent





MATIERE Titane

TEMPS D'USINAGE 10 minutes

LASER UTILISE 50W Nano FP IR

MACHINE UTILISEE LP 400U

Injection plastique innovante.

+GF+



microrelleus

ROCTOOL

Texturisation Laser

**Mais comment ça
fonctionne???**

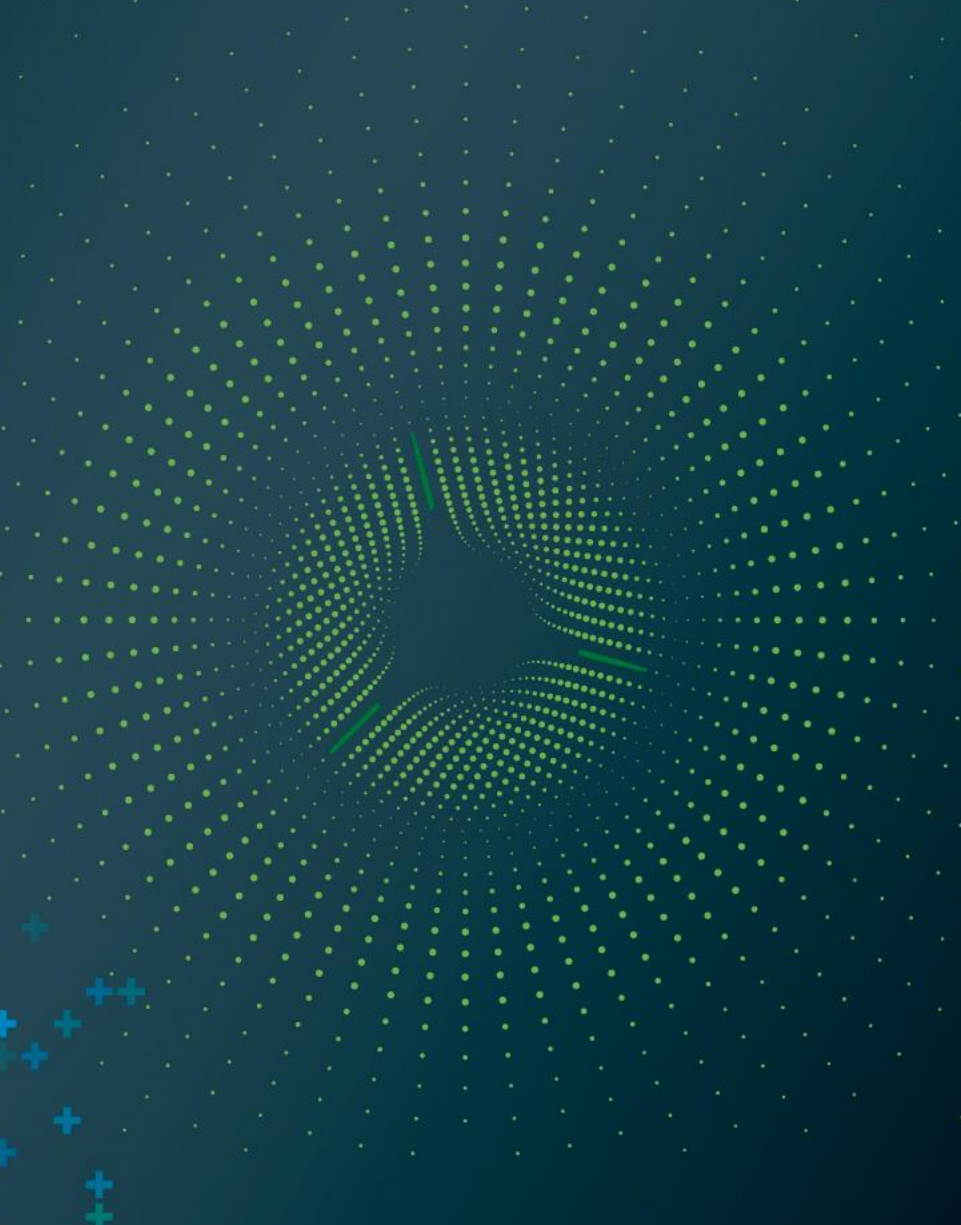
Usinage avec images... ou pas...



+GF+

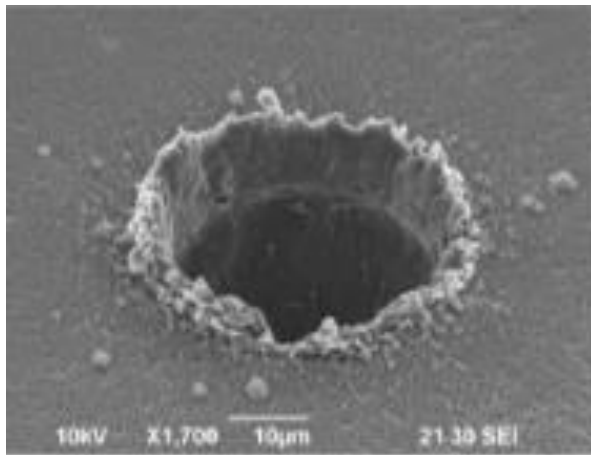
Surftherm 2018

Microolution



Point Fort #1

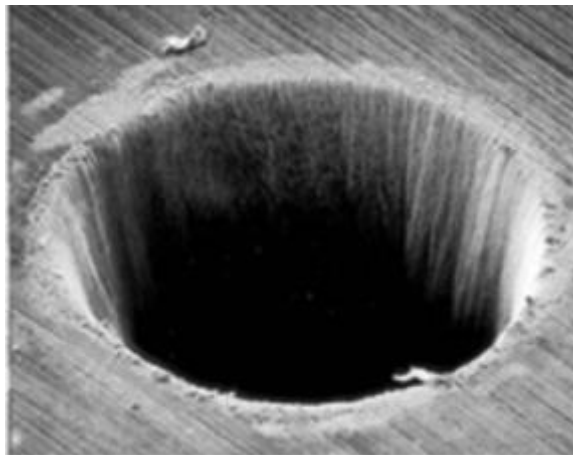
Femtosecond laser = Technologie de pointe



Nanosecond

ZAT (Zone affectée thermiquement)

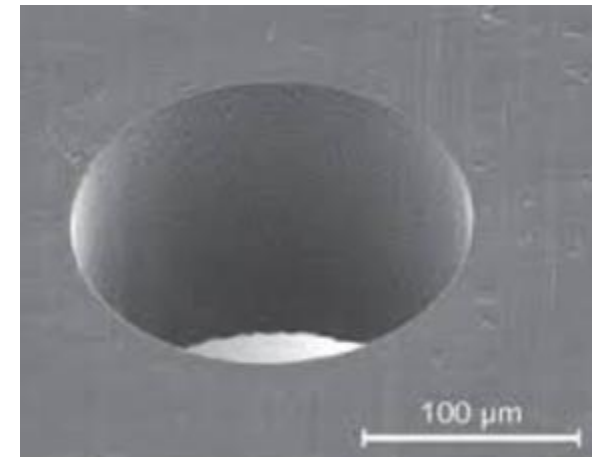
Zone fondue – Bavure résiduelle



Picosecond

Petite ZAT

Rugosité non contrôlée
sur les flancs



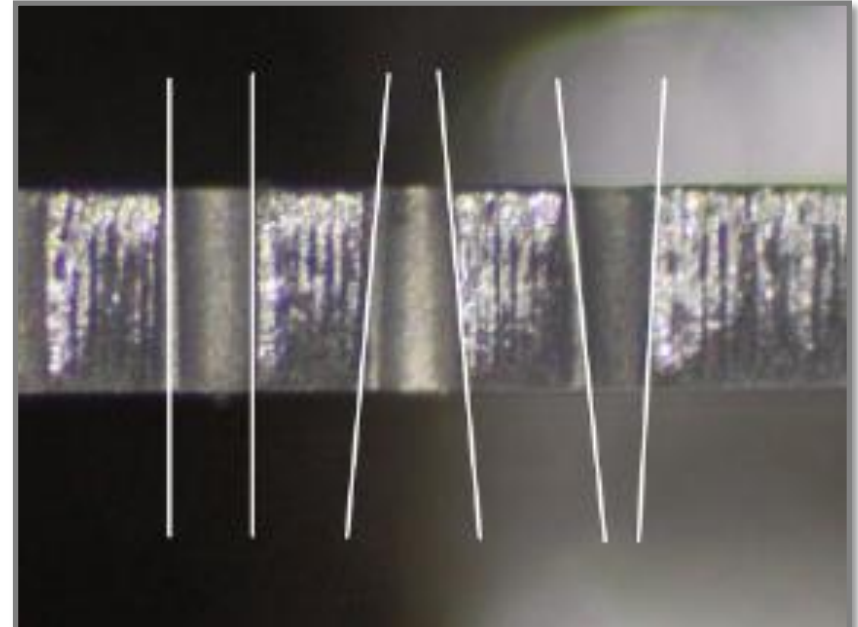
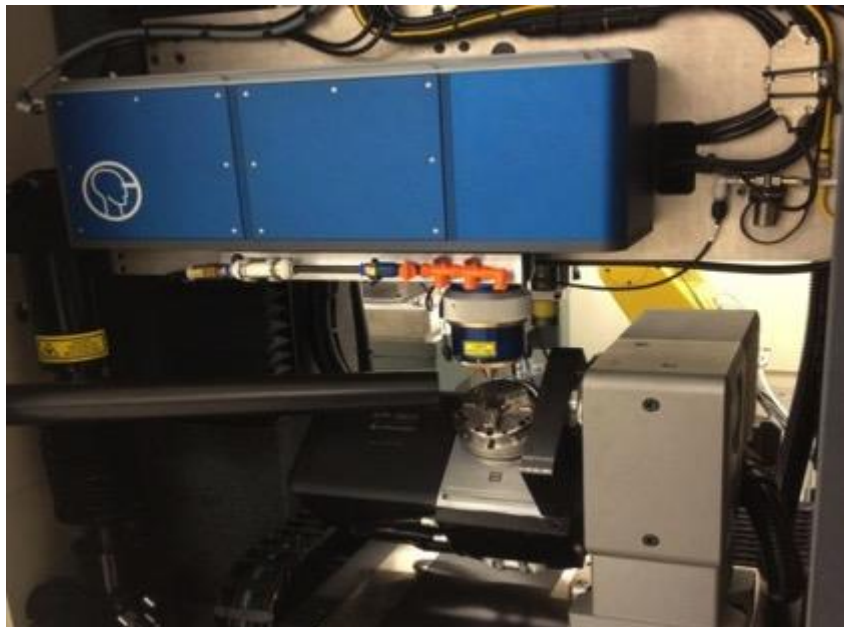
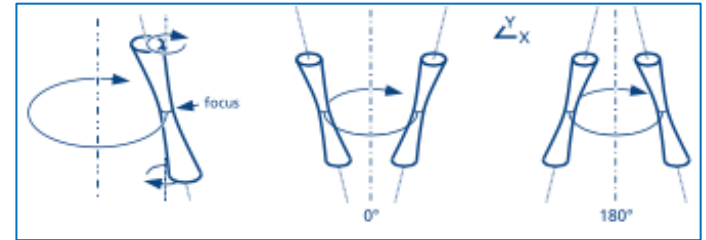
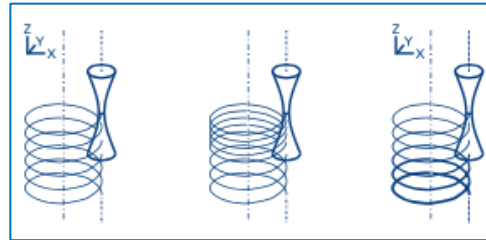
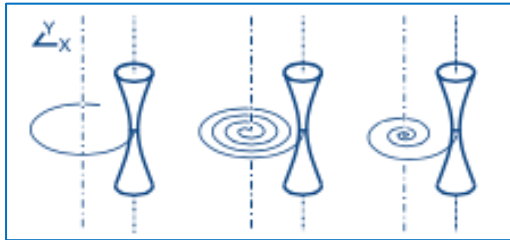
Femtosecond

Pas de ZAT

Rugosité contrôlée

Point fort #2

Angle de dépouille contrôlable = Haute flexibilité



Point fort #3

Design de machine Microlution = Grande précision même à haute vitesse

- Base Granite
- Moteurs Linéaires
- Règles optiques Heidenhain.



Point fort #4

Systemes de mesure embarqués = Solution Clé en main

Camera

Palpeur

Puissance mètre intégré

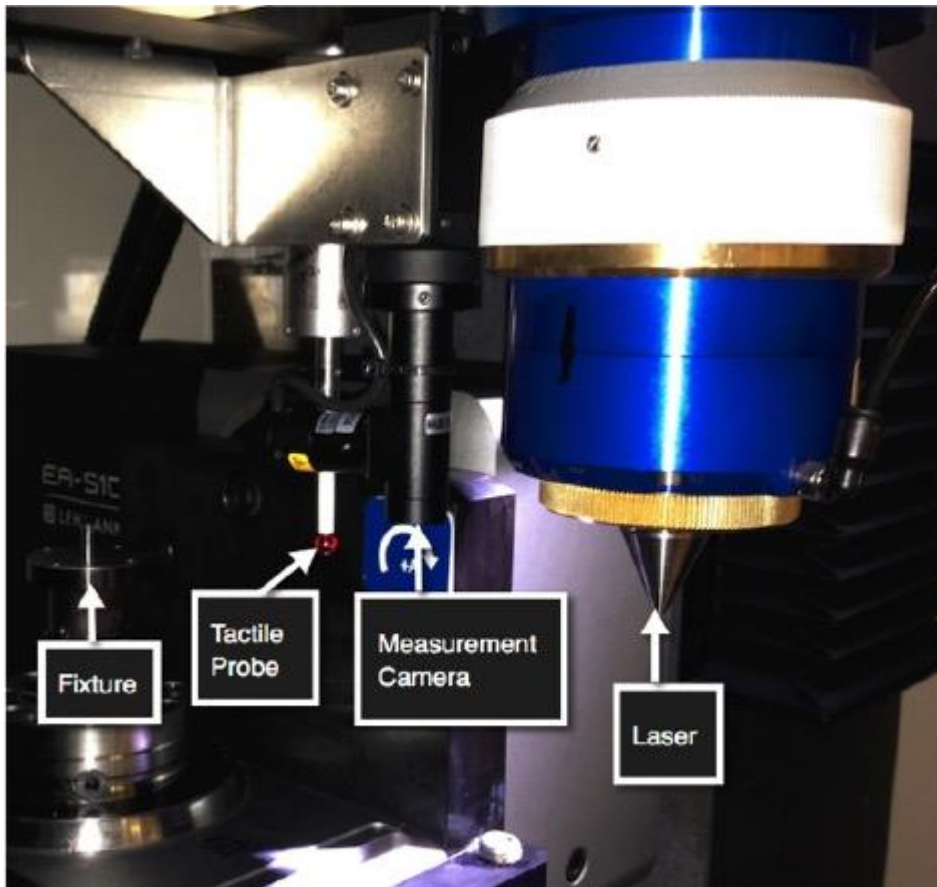
Benefices

Mesure en temps réel

Uniformité des pièces

Optimisation du temps de cycle

Mesures post process



Microlution Machines



ML-5
Femtosecond Laser

- + Ultrafast laser micromachining
- + Five-axis scan head
- + Five mechanical axis
- + Motion control
- + Real-time part measurement
- + Surface and edge quality



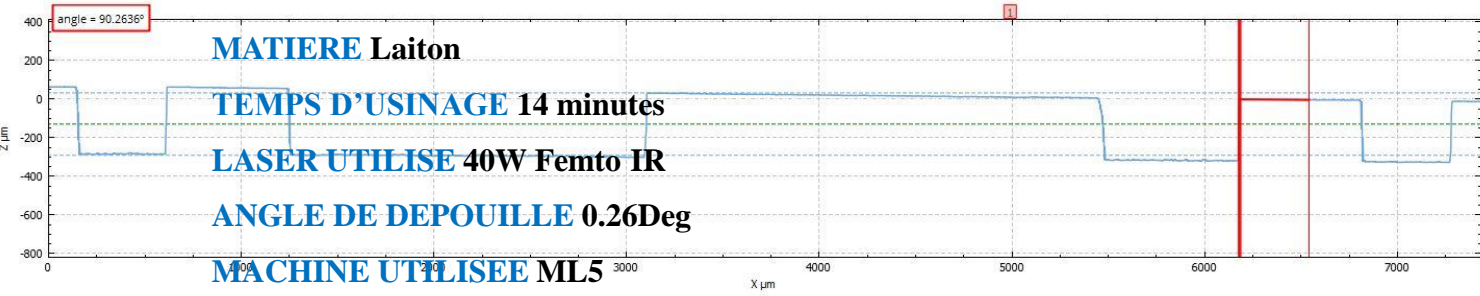
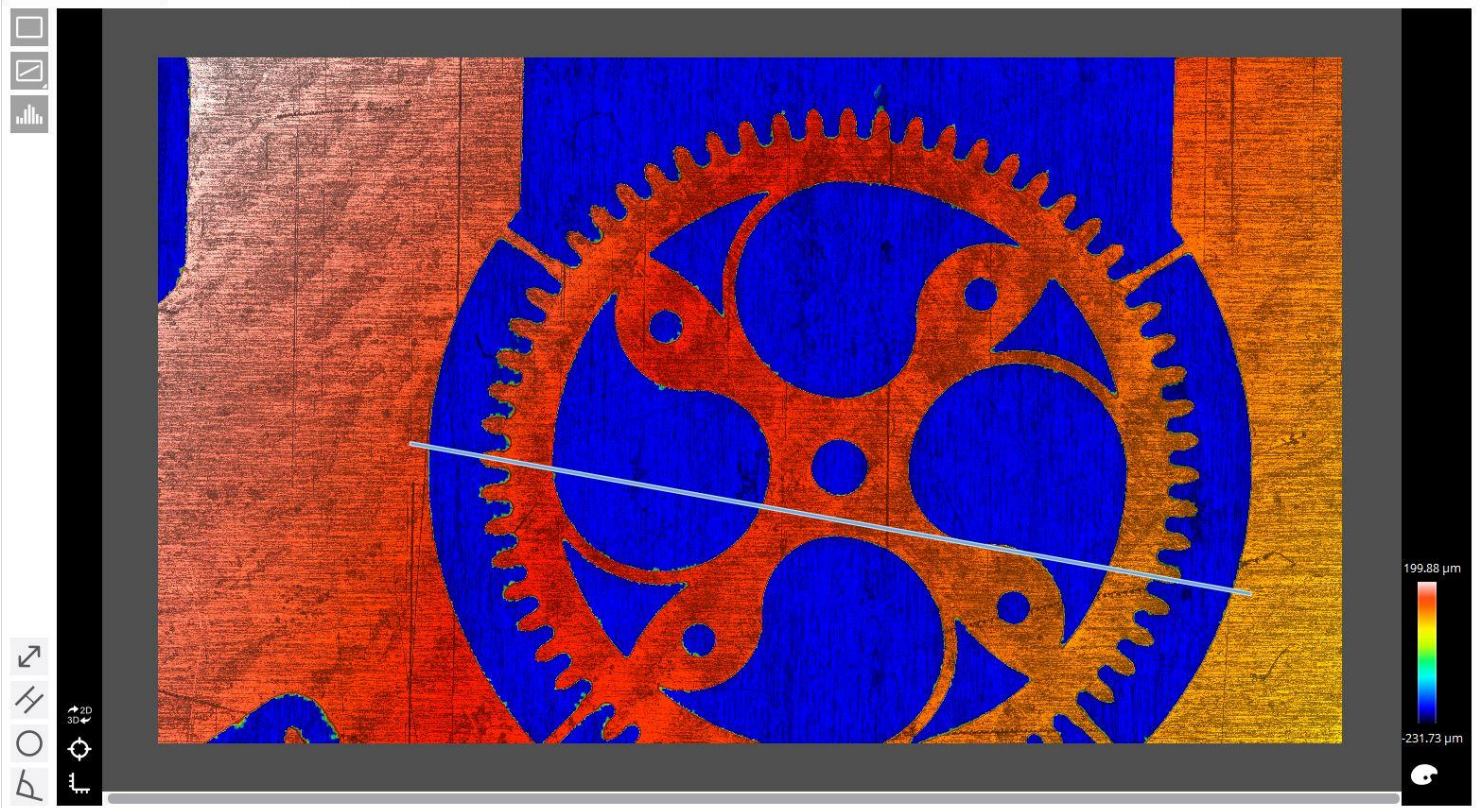
MLTC
Femtosecond Laser
and Turning Center

- + Ultrafast laser tube cutting
- + Closed-loop measurement
- + Bar feeder
- + Quick and accurate
- + Complex features



MLDS
Femtosecond Laser
Dual Workstation

- + Ultrafast
- + Five-axis scan head
- + Two active machining stations -
Dual laser or hybrid mechanical spindle
- + Part measurement and adjustment
- + Pick and place automation
- + High-volume applications



+GF+

Surftherm 2018

Impression métallique 3D

Additive Manufacturing



DMP Direct Metal Printers



DMP Factory 500

Print Volume:
500 x 500mm
(LxW)
500mm (H)

Laser Power:
3X 500 W



DMP Factory 350 DMP Flex 350

Print Volume:
275 x 275 mm
(LxW)
420 mm (H)

Laser Power:
500 W

LaserForm® Ready-to-Run Materials



BROAD RANGE, ROBUST MATERIAL DATABASES



LaserForm Ti Gr1
LaserForm Ti Gr23
LaserForm Ti Gr5



LaserForm 316L Surgical Steel
LaserForm 17-4PH



LaserForm Ni718 Inconel
LaserForm Ni625



LaserForm AISi10Mg
LaserForm AISi7Mg0,6



LaserForm CoCrF75



LaserForm Maraging Steel

Surftherm 2018

Merci pour votre attention!