





WELCOME!

MIKAEL SCHUISKY

VP R&D AND OPERATIONS

SANDVIK ADDITIVE MANUFACTURING



SAFETY FIRST

Sandvik's objective is zero harm to our people, the environment we work in, our customers and our suppliers.



PROTECTIVE
EQUIPMENT



FIRST AID
KIT



ALARM



EMERGENCY
NUMBER



EMERGENCY
EXIT



ASSEMBLY
POINT



PSYCHOLOGICAL
SAFETY



**NO PHOTOGRAPHY
NO VIDEO RECORDING**



SANDVIK



PROGRAM

TITANIUM POWDER BY SANDVIK
AND ADDITIVE MANUFACTURING

INAUGURATION CEREMONY

"OPEN HOUSE"

CLOSING: 11:30

EXTENDED PROGRAM FOR CUSTOMERS >>



WHY ARE WE HERE TODAY?

THIS IS ONE EXAMPLE...

360° CAMERA

30 KG

THE LUNAR AUDI QUATTRO
— a robotized **3D-printed** vehicle
in titanium and aluminium, that
will be sent to the moon to take
360° pictures.



IMAGE CREDIT: AUDI



LIGHTER
COMPONENTS

DESIGN
FREEDOM

MASS
CUSTOMIZATION

OPPORTUNITIES WITH
ADDITIVE MANUFACTURING
OR 3D PRINTING

INCREASED
PERFORMANCE

FASTER
REPAIRS

REDUCTIONS IN
INVENTORY



60%

REDUCTION IN MATERIAL USE

OPPORTUNITIES WITH ADDITIVE MANUFACTURING

OR 3D PRINTING

30%

REDUCTION IN GREENHOUSE
GAS EMISSIONS



LIGHT

STRONG

AS STRONG AS STEEL BUT WITH ONLY 60% OF ITS DENSITY

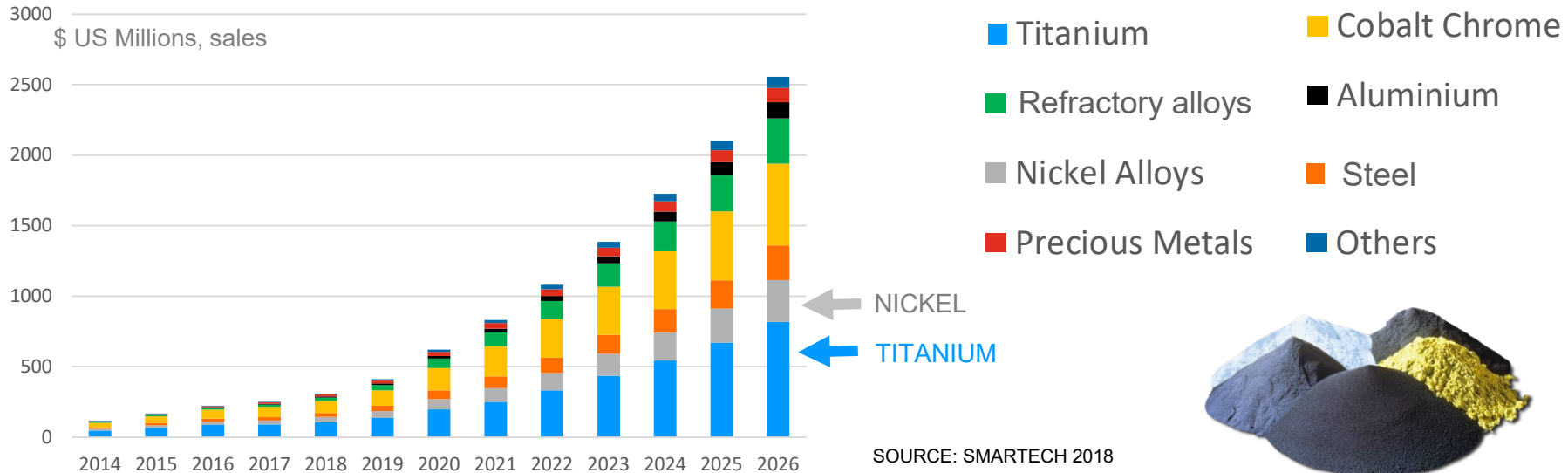
THE BEAUTY OF TITANIUM

CORROSION
RESISTANT

BIOCOMPATIBLE

METAL POWDER GROWTH (SALES)

TITANIUM POWDER WILL GROW THE MOST



SHIPMENTS OF TITANIUM POWDERS TO AM USERS GREW BY **32%** IN 2018



MARTIN MUELLER
POWDER OPERATIONS MANAGER
SANDVIK ADDITIVE MANUFACTURING







MARTIN MUELLER
POWDER OPERATIONS MANAGER
SANDVIK ADDITIVE MANUFACTURING



MEET OUR ATOMIZATION EXPERTS!

MAKING THE FINEST TITANIUM POWDER FOR ADDITIVE MANUFACTURING



MALIN BJÖRK

POWDER PRODUCTION LEADER



Pierre Mikaelsson
POWDER PRODUCTION OPERATOR /
PROCESS DEVELOPMENT

PIERRE MIKAELSSON

POWDER PRODUCTION OPERATOR
/PROCESS DEVELOPMENT



Malin Skog
POWDER PRODUCTION
OPERATOR

MALIN SKOG

POWDER PRODUCTION OPERATOR



The background of the image shows a 3D printing process in progress. A bright, glowing orange-yellow laser or heat source is visible at the top center, creating a series of horizontal lines that represent the layers of the printed part. The overall color scheme is dominated by warm, fiery tones of orange and red, suggesting high temperature and intense energy.

SO WHAT CAN YOU
3D PRINT IN TITANIUM

TOP USES OF TITANIUM POWDER

FOR ADDITIVE MANUFACTURING IN 2018



- | | |
|--------------------|-----|
| 1. Medical | 33% |
| 2. Aerospace | 27% |
| 3. Service bureaus | 17% |
| 4. Dental | 3% |
| 5. Automotive | 3% |
| 6. Oil & Gas | 2% |
| 7. Energy | 2% |
| 8. Other | 13% |



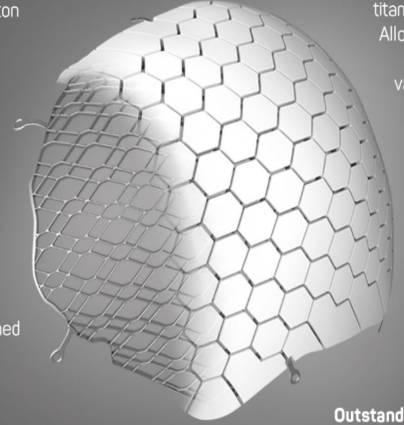
KAJSA BJÖRKLUND, OSSDSIGN

OSSDSIGN



Stability and protection
Based on the 3D printed
titanium skeleton

Mosaic tile design
Transfers load to the
titanium skeleton
Allows for tissue
ingrowth and
vascularisation

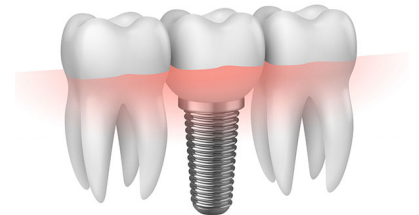


Easy fixation
With predesigned
fixation arms

Perfect aesthetics
Based on CAD design
and 3D printing

**Outstanding healing
properties**
Due to the unique
bioceramic material

OTHER EXAMPLES OF 3D PRINTED MEDICAL AND DENTAL APPLICATIONS IN TITANIUM:





MICHELE ANTOLOTTI, BEAMIT

Startup Carboni e Metalli wins award for custom motorcycle with carbon fiber and titanium 3D printed parts

AM service provider Beam-IT supplied the metal 3D printed parts for the Lunar Project bike



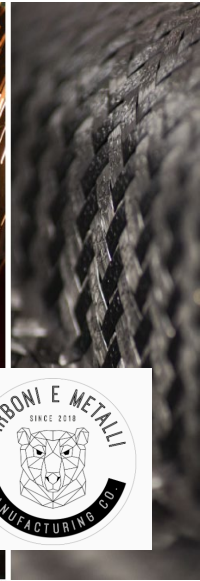
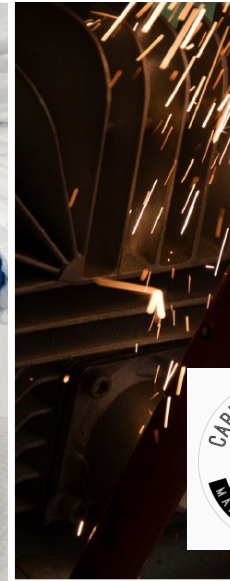
Davide Sher • October 18, 2019



3D Printing
Media Network



THE LUNAR PROJECT





3D PRINTED COMPONENTS FOR E-BIKES

BICYCLES

The 10 best cycling innovations

By Ben Coxworth
November 28, 2017



The Tern GSD, a remarkably compact cargo e-bike, is one of our picks for 2017

SOURCE: NEW ATLAS, NOVEMBER 2018



ZACH KRAPFL, GSD GLOBAL



PEDER ARVIDSSON, SANDVIK COROMANT

Lightweight CoroMill® 390

Produced with Additive Manufacturing

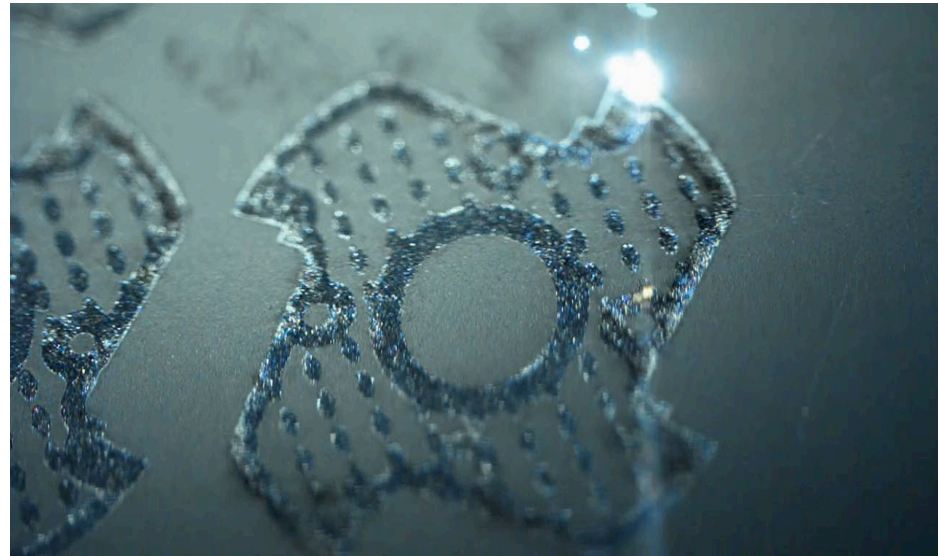
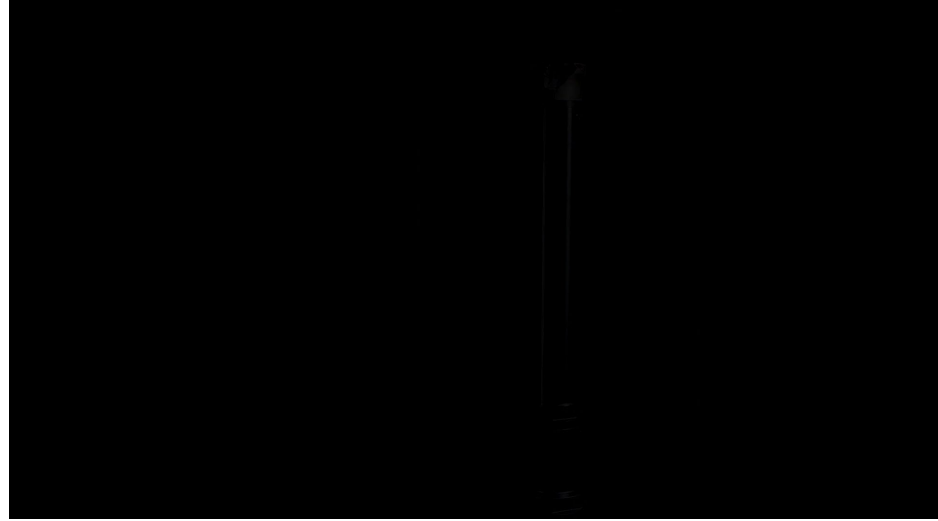


80%

REDUCED WEIGHT

UP TO
200%

INCREASED
PRODUCTIVITY



THE WORLD'S FIRST 3D-PRINTED SMASH PROOF GUITAR IN TITANIUM

TESTED BY YNGWIE MALMSTEEN







IMAGE CREDIT:
NASA/JACK SCHMITT



SOURCE: 3D NATIVES, MAY 2019



IMAGE CREDIT:
NASA/JACK SCHMITT



VICTOR HASSELBLAD



IMAGE CREDIT: NASA



LARS BERGSTRÖM
PRESIDENT
SANDVIK MACHINING SOLUTIONS





