



INDUSTRY F420



— KEY FEATURES

PRINTING

Drucktechnologie: FFF Filament Fused Fabrication

Bauram: 380 × 380 × 420 mm

Bauvolumen: 60 648 cm³

Schichthöhe mind.: 50 µm

Anzahl Druckköpfe: 2, Liftingsystem

Düsendurchmesser: 0.5/0.5 mm

Filamentdurchmesser : 1.75mm

Druckkopftemperatur: max. 500°C abh. v. Modul

Temperatur Druckplatte: max. 180°C

Temperatur Bauraum: max. 180°C (Aktiv beheizt)

Temperatur Materialkammer: max. 50°C

SPEED

Verfahrmodus: bis zu 1000 mm/s

Druckmodus: bis zu 400 mm/s

Maße und Gewicht

Abmessungen Außen: 1900 × 940 × 900 mm

Gewicht: 350 kg

Bauweise/Daten

Rahmen: Stahl

Gehäuse: Stahl und vacuformed ABS, Edelstahl

Druckplatte Oberfläche: Borosilicate Glas /
vacuum versiegelte Kunststoffolie

Genauigkeit Position XY: 0.006 mm

Genauigkeit Z: 0.0007 mm

Umgebungstemperatur

Temperatur Arbeitsumgebung: 15-32°C

Temperatur Lagerung/Stand: 0-32°C

Energie

Stromversorgung: 3-Phasen, 400V AC

Leistungsaufnahme max.: 4600 W

Leistungsaufnahme durchschn.: 1500 W

Kommunikation: Ethernet, Wi-Fi, USB drive

SOFTWARE

Slicing Software: 3DGence SLICER 4.0

Cloud Services: 3DGence CLOUD

Sicherheit

Filter: Filtereinheit, Advanced ULT Filtereinheit (Optional)

Sensoren: Tür Bauraum, Klappe Zugang oben, thermische

Sensoren, Notschalter, USV (optional)

Weiteres: Remote-Zugriff auf System



KEY FEATURE: SPEED

Ein wesentlicher Vorteil des neuen F420 ist die Geschwindigkeit.

Durch die Implementierung einer Reihe innovativer Lösungen konnten die Basisleistungen erheblich gesteigert werden. Dadurch eignet sich der F420 für hervorragendes Rapid-Prototyping genauso, wie für die additive Fertigung.

Verfahrmodus

bis zu **1 m/s**

Druckmodus

bis zu **400 mm/s**



— KEY FEATURE:

SPEED



3DGence
**INDUSTRY
F340**

Bremssattel: 36 h 18 min
IM part: 12 h 18 min
batch print: 41 h 30 min
single print: 3 h 29 min
average time:



3DGence
**INDUSTRY
F420**

caliper: 12 h 23 min
IM part: 5 h 11 min
batch print: 20 h 57 min
single print: 1 h 19 min
average time:

all prints: sparse infill, 0.25 mm resolution, ABS + support



— KEY FEATURE:

SPEED



Stratasys
FORTUS
450mc

caliper: 12 h 34 min
IM part: 6 h 50 min
batch print: 21 h 8 min
single print: 2 h 40 min
average time:



3DGence
INDUSTRY
F420

caliper: 12 h 23 min
IM part: 5 h 11 min
batch print: 20 h 57 min
single print: 1 h 19 min
average time:

all prints: sparse infill, 0.25 mm resolution, ABS + support



— KEY FEATURE: DRUCKMODULE



Mit den Druckmodulen sind Sie in der Lage viele verschiedene Materialien bis hin zu Highperformance Kunststoffen wie PEEK, PEKK und ULTEM™ zu verarbeiten. Die Module sind werkzeugfrei einfach zu tauschen.

Weitere Module und Materialien befinden sich in der Entwicklung und werden künftig das Portfolio ergänzen.



M280

Temperatur bis zu

280°C



MODEL
MATERIALS

ABS
ASA
PLA
PA6/69



MODEL
MATERIALS (möglich)

PP
PA6, PA12
PET/PETG
HIPS
PMMA



SUPPORT
MATERIALS

ESM-10
HIPS
BOVH



M360

Temperatur bis zu

360°C



MODEL
MATERIALS (MVP)

PC
ULTEM™



MODEL
MATERIALS (POSSIBLE)

PC/ABS
PA/ABS
PPS
Hi-Temp PA



SUPPORT
MATERIALS

ESM-10



M500

Temperatur bis zu

500°C



MODEL
MATERIALS

PEEK



MODEL
MATERIALS (möglich)

PEKK
PPSU
PSU



SUPPORT
MATERIALS

ESM-10



— KEY FEATURE: KINEMATIC SYSTEM



Der INDUSTRY F420 verwendet Schrittmotoren mit geschlossenem Regelkreis für die X-, Y- und Z-Betätigung. Der Betrieb in einem geschlossenen Regelkreis bedeutet, dass das System seine aktuelle Position überwacht und selbst korrigieren kann, sollte ein Fehler erkannt werden.

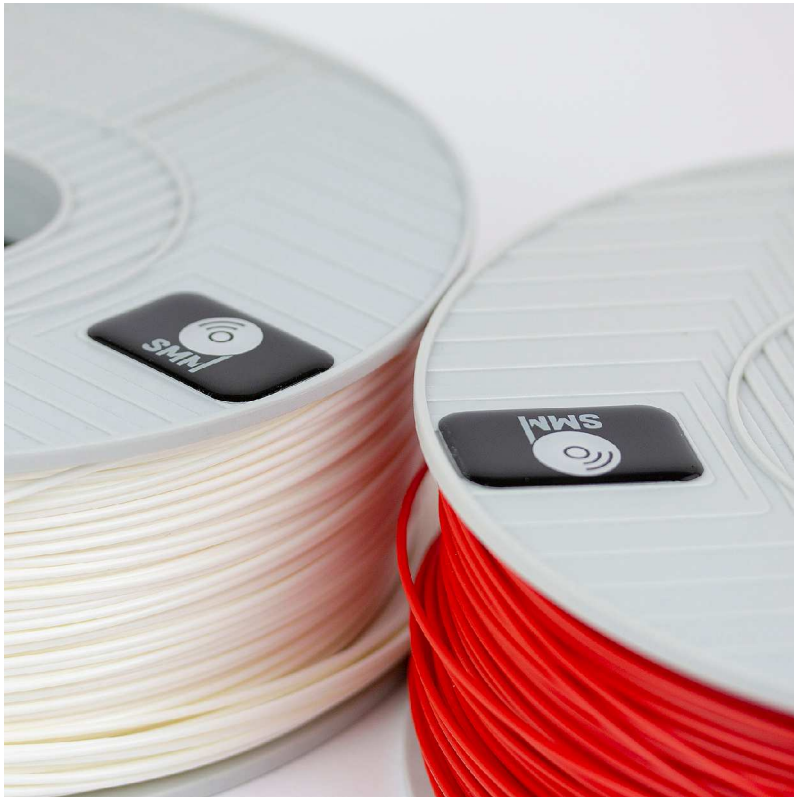
Vorteil: Keine falschen und lückenhaften Layer mehr.

Das kinematische XY-System basiert auf einem Stahlträger, der auf geringes Gewicht und Steifigkeit optimiert ist. X-Bewegung entlang des Portals, Y-Bewegung auf parallel verlaufenden Linearführungen auf gegenüberliegenden Seiten des oberen Fahrgestells.

Die Z-Achse ist um eine Kugelumlaufspindel mit einem zusätzlichen System zum Ausgleich unerwünschter XY-Verschiebungen gebaut, das führt zu einer sehr gleichmäßigen und konsistenten Bewegung.



— KEY FEATURE: NFC



In der Materialkammer befindet sich der NFC-Empfänger. Wenn eine Materialspule in den Schacht gelegt wird, wird sie automatisch erkannt und gelesen - es ist keine zusätzliche Aktion erforderlich.

Das NFC-System enthält nicht nur Informationen zu Materialgewicht, Typ und Hersteller, sondern kann auch neue Daten auf das NFC-Tag schreiben. Dies gibt die Möglichkeit, das Materialgewicht zu aktualisieren, wenn die Spule verwendet wird. Vor jedem Druckauftrag werden das verfügbare Material und die erforderlichen Materialwerte verglichen. Der Benutzer wird über die mögliche Notwendigkeit informiert, den zweiten Schacht zu beladen.



— KEY FEATURE: HEATED CHAMBER



F420 is equipped with a powerful, actively heated build chamber, capable of reaching 180°C. With a patent pending solution regarding variable chamber volume, time required for the working temperature to be reached remains minimal. Walls of the chamber are lined with INOX steel, preventing damage and oxidation.

Housed within the chamber is a nozzle priming sector. F420 no longer relies on mechanical nozzle blocking, using printhead purging instead. A purge cycle is only 3 seconds long.

The chamber is equipped with a colour camera.



— KEY FEATURE: BUILDPLATES

F420 heatbed, reaching 180°C, is dual function.

highly universal
mechanically resilient
easy, tool-less removal/replacement
mounted by metal clamps
sensor for detecting buildplate presence

BOROSILICATE GLASS

specific use
very effective in certain material combinations
easy, tool-less removal/replacement
mounted by vacuum

PLASTIC SHEETS

User can choose and switch between used buildplate material with no additional tools or changes to the machine. Pressurized air connection on printer installation site is required for vacuum functionality.



— KEY FEATURE:

FILTRATION

F420 uses an advanced ULT filtration unit, capable of filtering:

- macro dust
- nano dust (VOC, UFP)
- solvent vapor
- noxious gasses
- foreign particles

With focus on high performance thermoplastics it becomes increasingly important to provide adequate emissions control. F420 filters offer unprecedented filtering efficiency among FFF AM platforms.



— KEY FEATURE:

AUTOMATIC SPOOL CHANGE



F420 has four material bays, storing four 1kg spools of material. By default, two are dedicated to model material and remaining two house support material.

F420 is capable of automatic spool change mid-print. Once filament end is detected, the machine will load material from the second bay without any user intervention and resume printing seamlessly.

Material bays are continuously heated to 50°C. This temperature can be adjusted via printer interface. With specific spool geometry, mounting four 2kg spools is possible with all functionalities retained.



— KEY FEATURE:

NEW EXTRUSION TRAIN

F420's extrusion train has been designed from ground-up to yield maximum performance. As such, it bears no resemblance to older designs of extruders and printheads.

- encoded, direct, dual drive gear extruders
- high power, full metal printheads
- modular, quick-change and simple to service

Measured throughput for the new design reaches **500g/h**, with theoretical values of up to 700g/h, depending on nozzle diameter.

Default nozzle diameter is **0.5mm**. Additional planned diameters are 0.3mm and 0.8mm.



— KEY FEATURE:

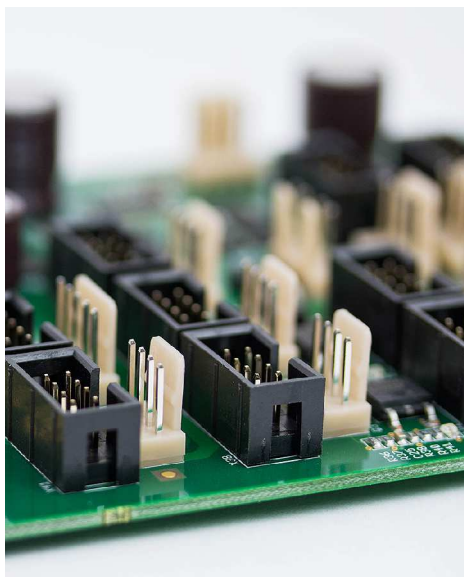
3DG NUMERICAL MACHINE CODE

G-code parsing is a text-based operation. This requires significant processing power and is suboptimal for high speed code processing required for increased machine throughput. **3DGence has been working to write a brand-new machine code, called 3DG, to remedy this problem.** 3DG is based on numerical values and does not require the computational unit to parse text - thus increasing the parsing performance tenfold. This means that the machine processes and buffers G-code much faster than it executes it - never having to wait or stutter as new code is being parsed.

Toolpath generation or model requirements have not changed - from the user standpoint, the new code is invisible.



— KEY FEATURE: NEW MAINBOARD



F340 was based on a proprietary controller - the Titan. Using Texas Instruments drivers, it was, at the time of its release, a superior motherboard.

With increasing performance demands, a new controller had to be developed. Build around a 32-bit architecture, the system is highly adaptable and modular. It can support up to 9 stepper drivers, BLDC motors or servos. GUI and whole user interface, along with cloud services, are done by a coprocessor - the main CPU only focuses on machine control. Those two processing units run in parallel, and do not affect each others performance, storing ample computing power for immediate job control.



— KEY FEATURE: **CLOUD ENABLED**



- remote print start, cancelling and queuing. Full control over job order and execution, even on multiple printers
- real time monitoring of machine and print status
- aggregation and presentation of machine and material usage statistics
- service access module; 3DGence support team may access, diagnose and provide help remotely
- file sharing and storage
- access control and administration
- marketing functionalities
- live camera feed
- asymmetric encryption for data transfer (RSA)



— KEY FEATURE: SAFETY

- an electronic lock of the main chamber door, also controlled via Cloud service and printers' interface
- sensors for main chamber door and top access hatch
- redundancy for thermal sensors of high-power heating elements
- emergency switch - immediate cut of power to motion and thermal control
- system for emergency shutdown of logic
- software access overdrive - the printer can be remotely shut down



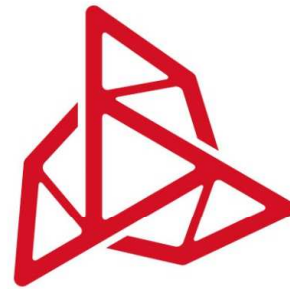
— KEY FEATURE:

UPS

F420 may be equipped with a 72Ah UPS unit. Printer supports all functions during short power outages. UPS is integrated with the system at a deeper level, monitoring UPS battery life. In case the power loss is longer, the printer will switch to idle support mode. Printing will be paused, and only key thermal control and logic functionalities will be maintained. Should the power be restored, printing will continue normally. This dual approach can yield two results:

- unaffected printer performance during short power outages
- longer battery life in case of longer power issues





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