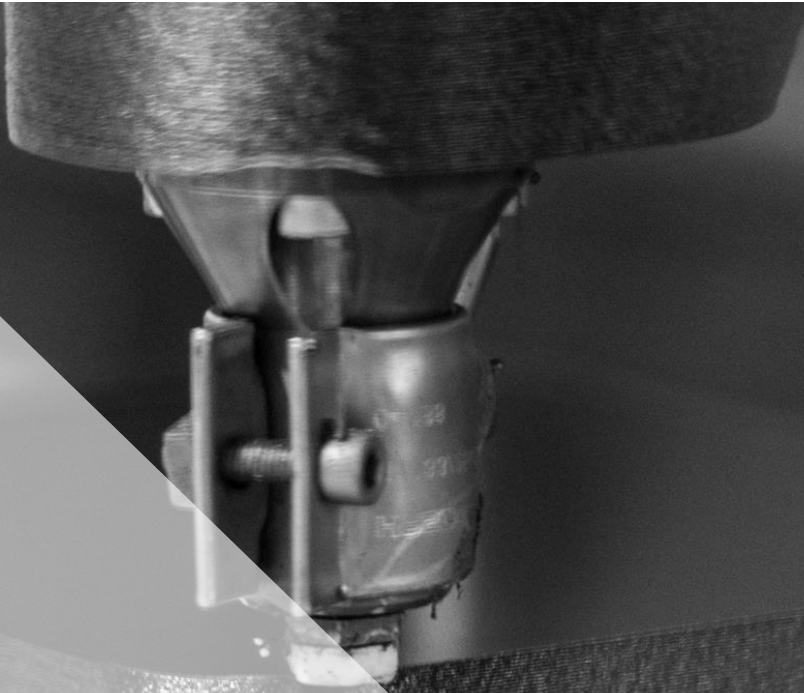


ADDITIVE MANUFACTURING.
AS EASY AS MOULDING.

YIZUMI
GERMANY 



SPACEA



SPACEA



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As a supplier of molding machines, we want to raise the production of additives for plastics to a new industrial level. Our vision "Additive Manufacturing. As easy as moulding" is our passion.

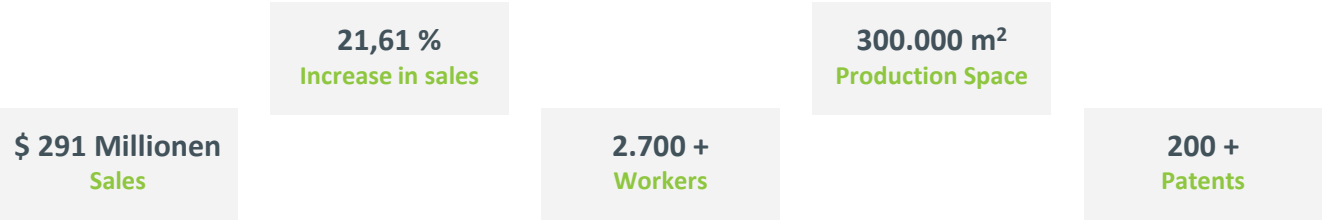
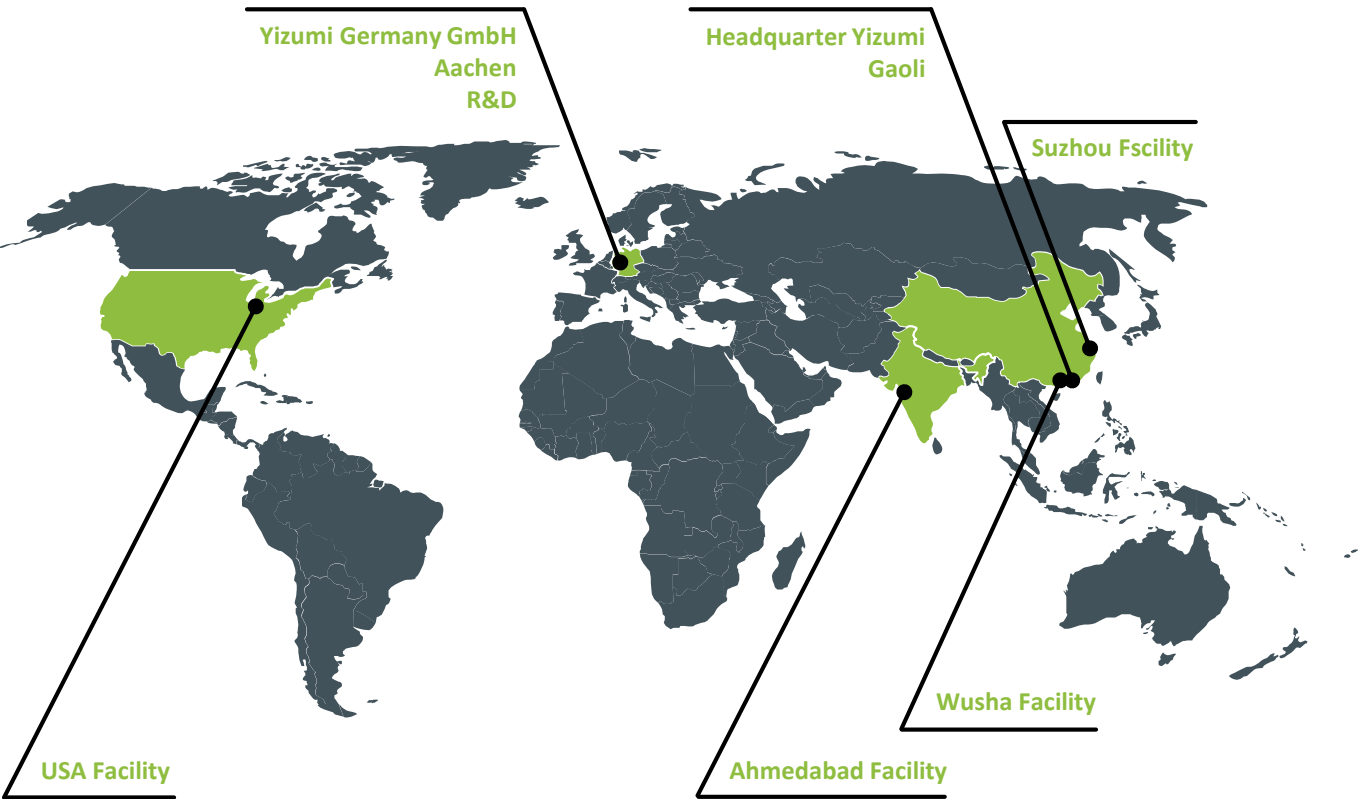
Pellet Extrusion Manufacturing
(SpaceA Product Family)



ADDITIVE MANUFACTURING.
AS EASY AS MOULDING.

YIZUMI
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Yizumi Germany



With the widely spread usage of molding technology for light alloys and polymer based composites the nature of modern industrial production changed. Cheap mass production became possible. Today light alloys, made from aluminum, magnesium and zinc, as well as polymer -composites, being represented by plastics and rubber, become indispensable raw materials for industrial and consumer products. Therefore the essential molding machines experienced a fast development.

At the beginning of 2002 Yizumi produced its first injection molding machine in Siji, Ronggui sub-district. Afterwards Yizumi launched machines for die casting of aluminum ,magnesium and zinc alloys, Rubber injection molding and automated robotic integrated systems. Therefore the company receives a lot of recognition from increasingly well known customers of the injection molding sector. Yizumi is one of the top three Chinese injection molding manufacturers and is one of the two leading manufacturers for die casting and rubber injection molding machines.

On January 23, 2015, Yizumi experienced a successful listing on the A stock market on the Shenzhen Stock Exchange, which meant a new start for the company's development. For now 13 years Yizumi committed to improve Chinese equipment technology for being able to compete with the world and improve its technical strengths, product quality and services. Yizumi will progress as usual. The new goals are to become a world market leader in its industry, to diversify product connected to molding machines for special cases and to give space for innovation in product development and corporate operations. By this path Yizumi products should be recognized by customers and colleagues worldwide.

In addition to the manufacturing base, which is located at the address of Shunde National Hi-tech Industrial Zone an area of 80,000 m 2the factory in Wusha (81,117 m2) and the factory in Suzhou (1st stage land area of 33,213 m2) were also put into operation. They will cover Yizumi's development needs over the next five to ten years. Yizumi also implemented the YIZUMI HPM dual brand strategy in global markets and is building a foreign base in North America and India to develop and consolidate foreign market share.

To further improve its products, Yizumi introduced the IPD product development mode, which follows rigorous procedures and updates products based on customer needs. Yizumi has invested more than RMB 120 million in building its own precision manufacturing platform and a constant temperature measurement and test center to further improve product quality.

The greatest importance of Yizumi's existence lies in generating added value and a better return for its customers. In the future, the company intends to become more involved in areas such as energy saving technology, automation, precision control and faultless products to ensure that our products are advanced and reliable. Meanwhile, we are dedicated to establish a better service system in the industry to provide fast, high-quality service. We are constantly striving to improve the competitiveness of our customers worldwide.

Yizumi AG's latest technology field now includes additive manufacturing. This exciting and innovative manufacturing technology enables the expansion of the classic manufacturing portfolio and is intended to offer our customers added value in dealing with the conflicting demands of increasing variant diversity and decreasing unit costs.



Goal: We are committed to delivering better returns and customer experience for our global customers.

Mission: We are committed to becoming the leading Chinese machine manufacturer over the next five years,a true global company that is part of the global business system in the important growth markets of the world.is established.

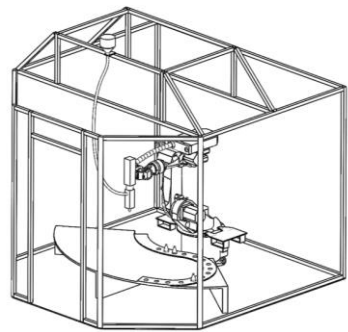
Vision: We want a long-lasting company with effective operation, efficient management and excellent to become a culture of which the employees, who are given social respect, are proud.

03

Pellet Extrusion Manufacturing

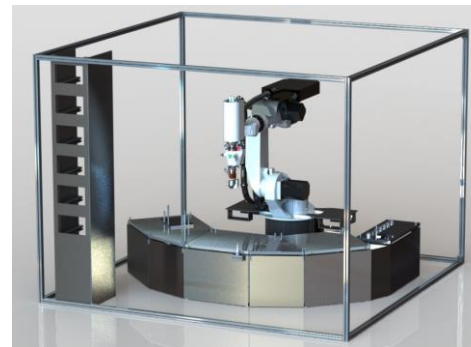
Two worlds working together

09/2015
Concepted by Institut für Kunststoffverarbeitung (IKV) at the RWTH Aachen



Automated combination of additive and subtractive manufacturing processes

12/2015
Digital Shadow



10/2016
Live demonstration at the K trade fair 2016



04/2018
Live demonstration at the Hannover Fair

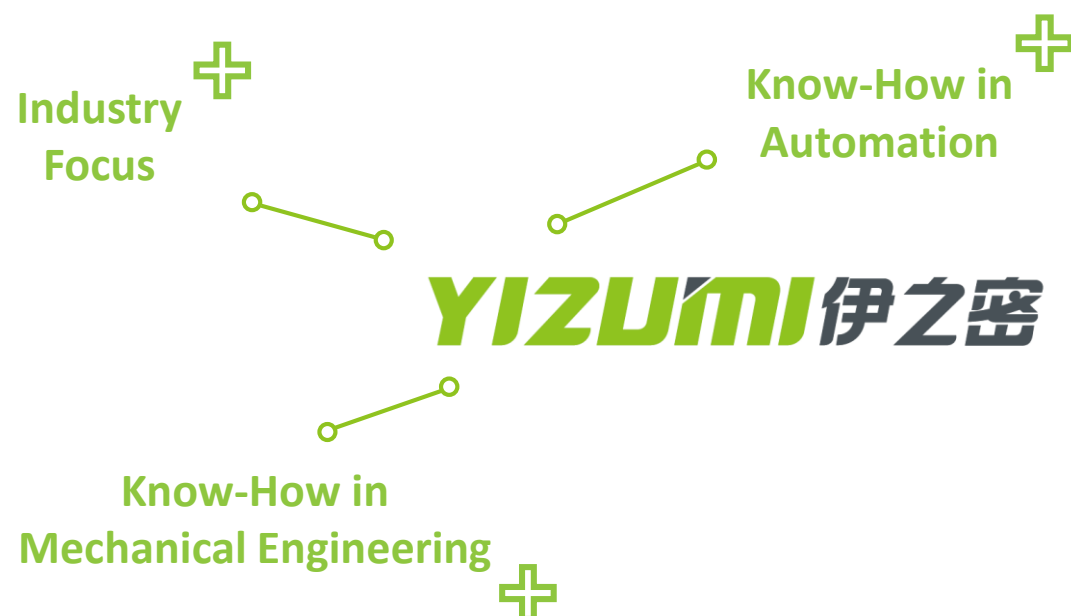


Heute
Industrialized solution
SpaceA product family

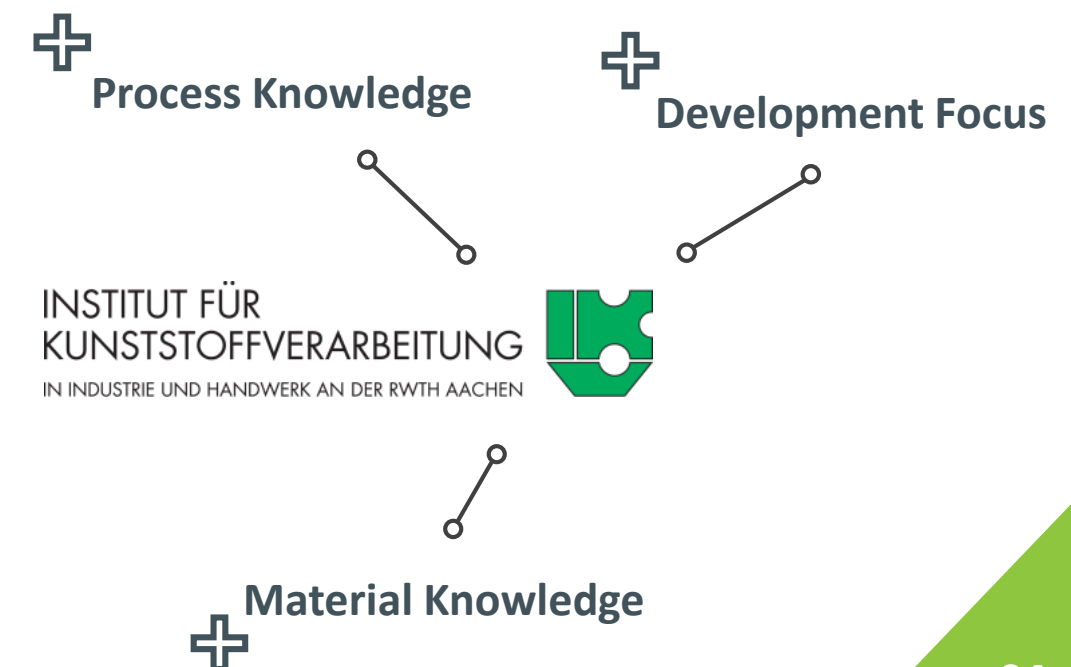


Guangdong Yizumi Precision Molding Co., Ltd.

Institut für Kunststoffverarbeitung (IKV)
an der RWTH Aachen



Common
Industrialisation



SPACEA at a glance!

SpaceA technology is based on the layer-by-layer deposition of molten thermoplastic. A solid component can be built by solidifying this melt strand. Yizumi's SpaceA technology is based on 4 principles for economical use:

- Use of a screw extruder
- Use of a 6-axis positioning system
- Use of a high plant modularity
- Use of an industry standard control system

Control on Industry Standard

Higher-level control concept with many interfaces available in the standard version

Material Pretreatment

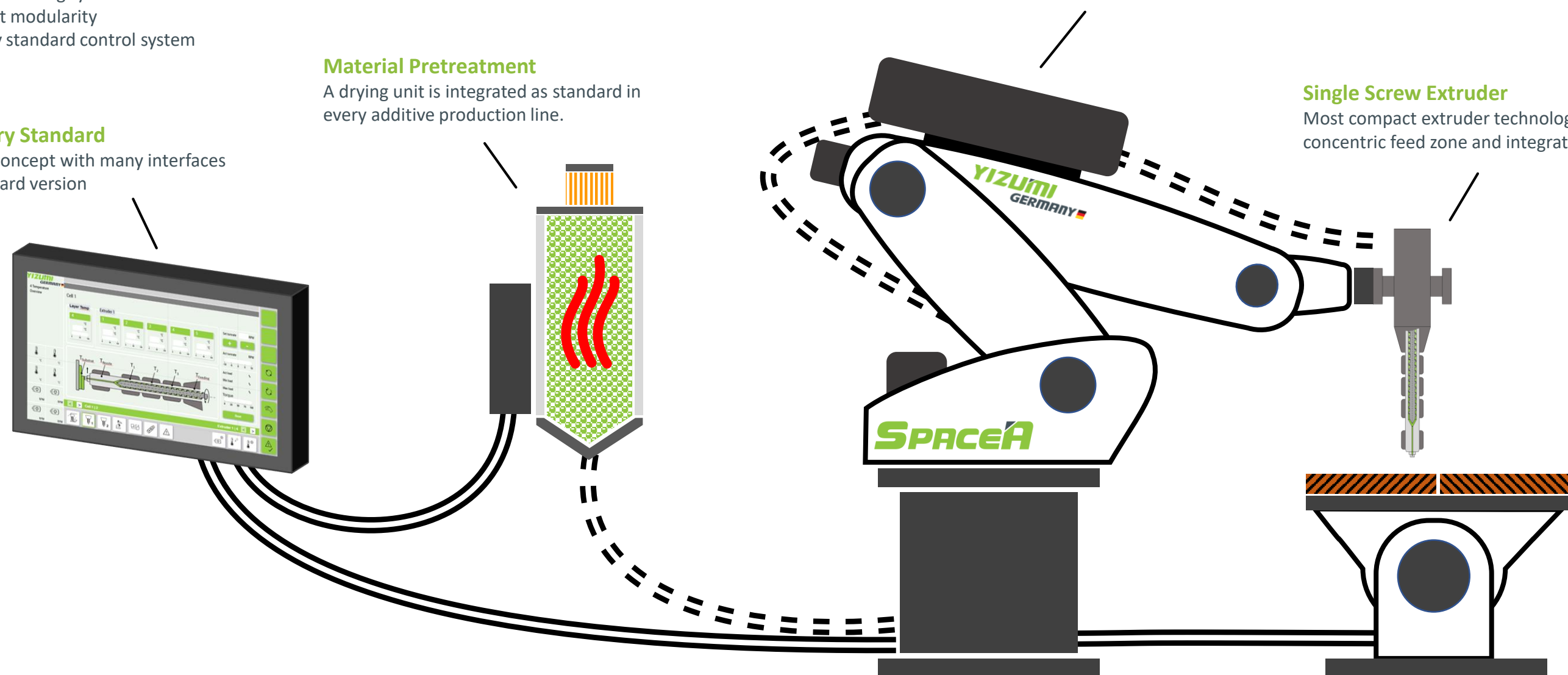
A drying unit is integrated as standard in every additive production line.

Positioning System

A 6-axis robotic system with positioning accuracies of 0.05 mm

Single Screw Extruder

Most compact extruder technology with concentric feed zone and integrated drying unit



First, the material is pre-treated in a **dryer**. This dryer is included in all standard systems. The material is fed from the dryer to an **extruder**. The extruder is a compact single-screw extruder weighing only 6.5 kg. There the pellets are plasticized and discharged in a defined manner. The final component can then be produced on the **construction platform** by a relative movement of the positioning system. The entire process is controlled by a higher-level **control system**.

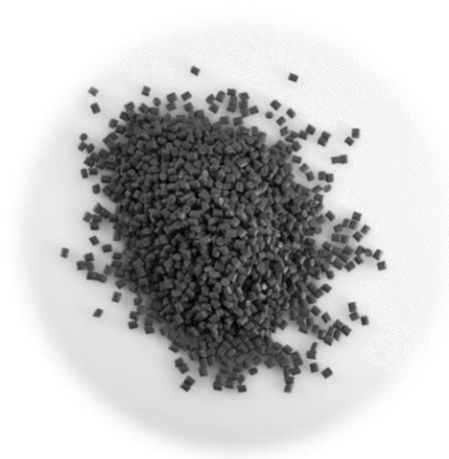
The controller allows networking with other production units on the hardware and software side. Interfaces such as EUROMAP 67, Ethernet or EtherCat are available as standard.

Your Advantages at a glance!

Printing becomes producing

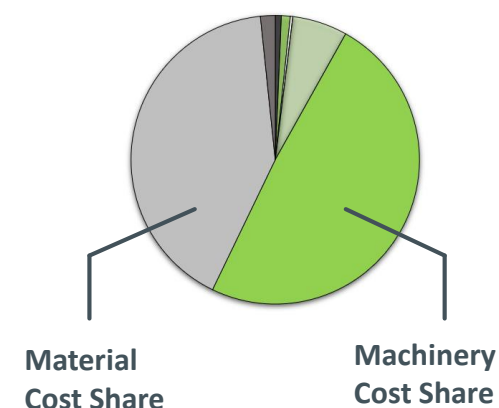
Material Diversity

The screw plasticizing unit is operated with conventional thermoplastic granulate. Compared to filament-based production technologies, this enables the processing of unfilled, but also highly filled plastic compounds with simultaneously high and scalable throughputs. The possible high throughput leads to a considerable cost advantage in the processing of engineering thermoplastics. In addition, depending on the material, the low price of granulate (approx. 1 to 8 €/kg) compared to filament (approx. 20 to 500 €/kg) results in a considerable cost reduction potential. As with all manufacturing processes, the production results depend on the process capability of the material used. The main aspects here are dimensional accuracy (shrink drives) and mechanical properties (adhesion drives).



- Easily available
- Low cost
- Already certified materials

Cost Allocation



Part costs < 8 €/kg Part possible

- High material throughput
- Low machine investment
- Low material costs

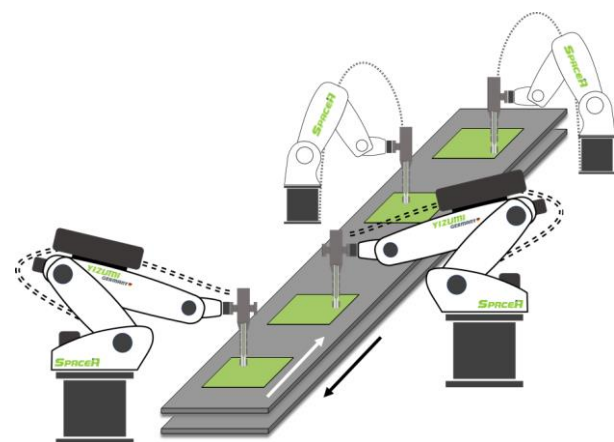
Productivity & Economical Efficiency

The high productivity of the process used is based on the physical principle of shear heating within the screw extruder used. In contrast to pure plastification via heat conduction, a scalable conveying rate independent of the thermal conductivity of the material to be processed can be achieved. Depending on the process point, the conveying rate can be increased to several kilograms per hour.

Like previous manufacturing processes, additive manufacturing plants must also be subject to the usual investment calculations. Accordingly, the plant investment must be reduced and the material output increased at the same time. Only with high ratios of absolute investment and material output per year can economic production be guaranteed in comparison to injection molding.

High Potential of Automation

A 6-axis industrial robot overcomes the usual limitations of component size and design complexity. In order to ensure reproducible dimensional accuracy and high surface quality and at the same time avoid a restriction of component complexity, subtractive processes are integrated into the manufacturing process by combining additive structure and machining in one manufacturing system. Based on this approach, it is also possible to integrate inserts such as threaded or bearing bushes, injection molded parts, electronic or ceramic inserts and to equip the component to be manufactured with additional functions. For this purpose, the machine used for extrusion and machining operations is equipped with a standardized tool changing system, which guarantees a high degree of automation and flexibility.

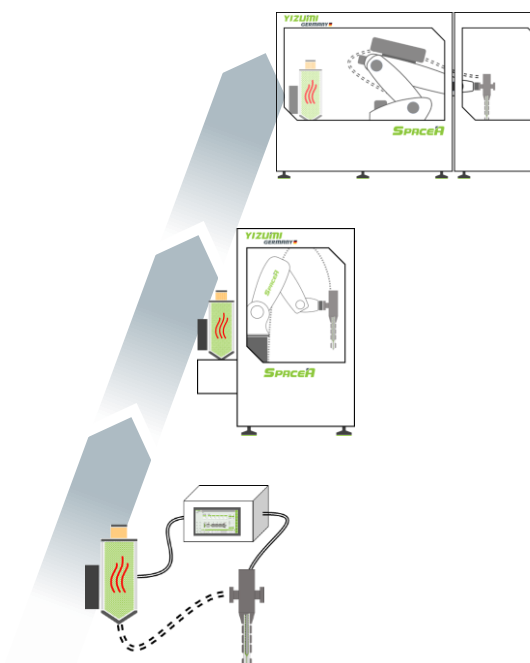


- Standart interfaces
- Consistently thought-out automation approach

Scalability

The flexibility of the system is based on the separation of platform module and print module. Thus, a standardized production module can be combined with different platform modules or several production modules can be combined with one platform module.

Thanks to this modularity, the system can also be easily integrated into existing production chains, for example to functionalize injection molded parts. The high productivity of the SpaceA product family makes it possible to apply sealing elements or reinforcing structures to the component in the cycle of an injection molding machine.



Modular System

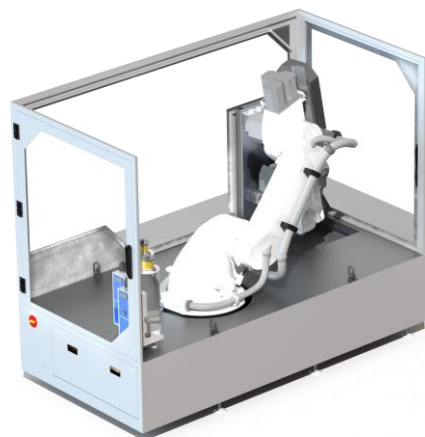
For flexible use on a standard basis

Print Modul



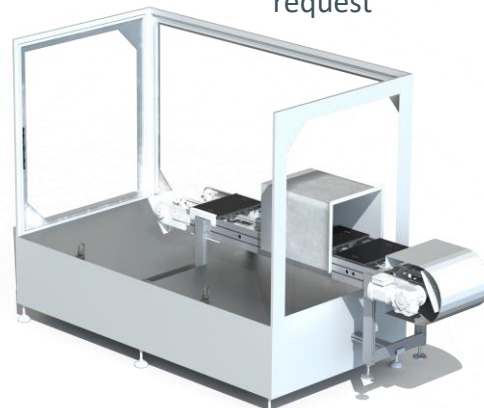
Platform Modul

- screw extruder
- milling cutters
- gripper
- granulate dryer
- Further solutions on request

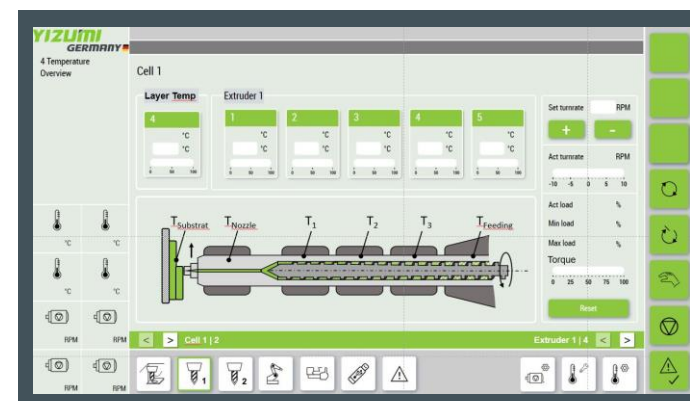
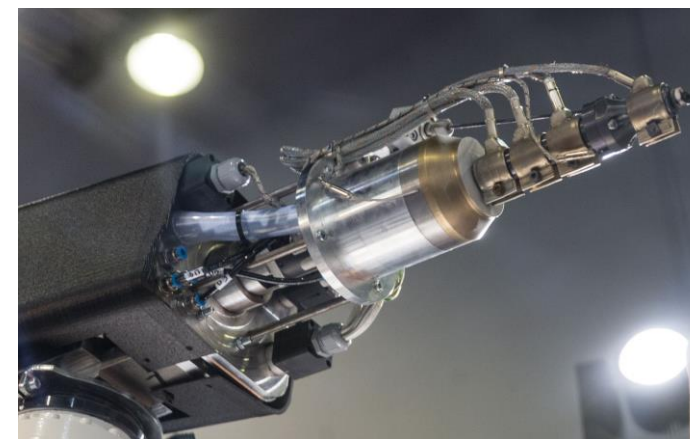


The flexibility of the system is based on the separation of platform module and print module. Thus, a standardized print module can be combined with different platform modules or several print modules can be combined with one platform module.

- workpiece carrier
- conveyor system
- conveyor
- turntable
- Fixed construction platform
- Further solutions on request



Thanks to this modularity, the system can also be easily integrated into existing production chains, for example to functionalize injection molded parts. The high productivity of the SpaceA product family makes it possible to apply sealing elements or reinforcing structures to the component in the cycle of an injection molding machine.



Robot

The modular platform allows the integration of different robot sizes and ranges. This means that the most suitable and therefore cost-effective positioning system can be used for every production application.

The robot can be integrated into existing automation processes and combined with other manufacturing processes.

Extruder

Diameter:	16 mm
Temperature control:	1 cooled zone 3 heated zones
Max. temperature:	350 °C
Granulate size:	< 5 mm rod granulate
Range of materials :	thermoplastics filled and unfilled
Throughput capacities :	5 – 20 g/min. by default

Serenity-Control

A higher-level control allows simple operation and integration into existing automation technology. Process data can be written down. An ergonomic HMI (Human Machine Interface) represents the machine interface to the operator.

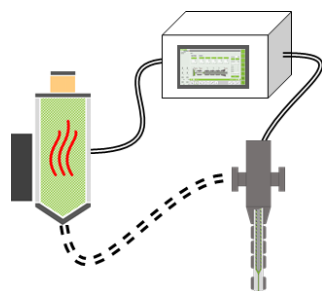
The backbone of the controller also allows easy connection to other machines.

Drying

The systems of the SpaceA product family are delivered with material dryers. These guarantee the processing of adequately pre-treated thermoplastic granulate.

SPACEA Productfamily

Modular platform strategy



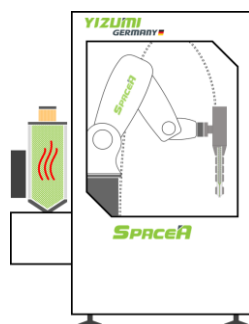
Extruder Extension Package

Upgrade of an automation cell in your production with an Extruder Extension Package.

The standard equipment includes a dryer, a material conveyor, a screw extruder, a control unit for pneumatic and electronic components with higher-level control.

From 35.600,00 €

Scalable in throughput



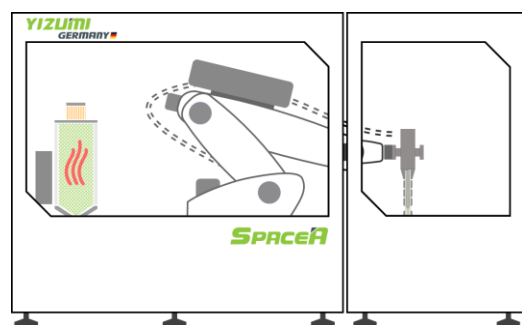
Small Size Machine

Small size systems are offered as a complete systems.

The standard equipment includes a dryer, a material conveyor, a screw extruder and a control unit for pneumatic and electronic components with higher-level control as well as an industrial robot and a housing.

From 76.800,00 €

Scalable in range and throughput



Big Size Machine

Big size systems are offered divided into print and platform modules.

The standard equipment includes a dryer, a material conveyor, a screw extruder, a control unit for pneumatic and electronic components with higher-level control, an industrial robot and the housing for the print and platform module.

From 125.800,00 €

Scalable in range and throughput

Standard

Extruder

- 16 mm single screw extruder
- Servo-electric screw drive
- Integrated granulate dryer 100 g
- Integrated automatic granulate conveying system
- Integrated pneumatic welding zone cooling

Control

- Electrical interface (EtherCat)
- Superior Serenity Control
- 18.5" multi-touch color display for real-time visualization of process parameters. The Serenity controller provides the user with free and intuitive operation without the need for training.

Others

- Fixed magnetic construction platform
- Compressed air dryer with 5 L capacity
- Pneumatic connection for manual compressed air removal
- 1 x 230 V electrical connection at your disposal.

Options

Robotic system

- The plant size can be adapted to the product dimensions of each machine series.
- The plant can optionally be designed as a hybrid plant. The combination of different extruders, milling spindles or grippers offers even more flexibility.

Control

- Further electrical interfaces (Ethernet, EUROMAP 67, OPC-UA)

Others

- If required, the plant can be connected to a central granulate feed system.
- The construction platform can be designed as a workpiece carrier conveyor system.
- Further automation approaches are possible on request.

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SPACEA Productfamily

Example plants

SpaceA-1-700-500 S – Fixed platform



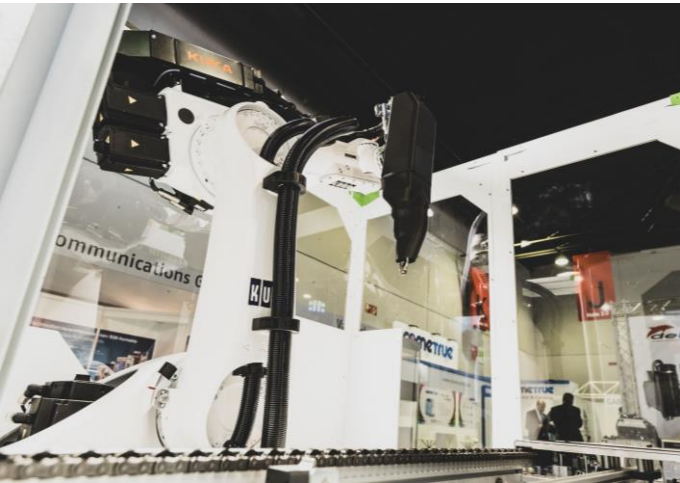
- Positioning:** An industrial robot
(10 kg max. weight)
- Building platform:** 1 fixed magnetic building platform
(640 x 400 cm²)
- Tools:** 1 Extruder
- Footprint:** 1,2 x 1,3 m²

SpaceA-1-2000-500 H2 – Piece carrier system



- Positioning:** An industrial robot
(30 kg max. weight)
- Building platform:** Piece carrier system
(0,4 x 0,4 x 1,5 m³)
- Tools:** 2 Extruder
1 milling spindle
- Footprint:** 2,8 x 3,8 m²

SpaceA-1-2000-500 S – Fixed platform



- Positioning:** An industrial robot
(30 kg max. weight)
- Building platform:** 1 fixed magnetic building platform
(1,5 x 1,0 x 1,5 m³)
- Tools:** 1 Extruder
- Footprint:** 2,7 x 2,8 m²

SpaceA-2P-2000-500 H2 – Turn table

- Positioning:** Two industrial robots
(30 kg max. weight)
- Building platform:** tilting rotary table
(2-Axis)
- Building space:** 2 x 1,5 x 1,5 m³
- Tools:** 4 Extruder
2 milling spindles
- Footprint:** 5,0 x 2,8 m²

