HYRAX

**Laser-based 3D printers
for efficient and cost-effective
manufacturing of intricate metal parts**

aditiv
SOLUTIONS

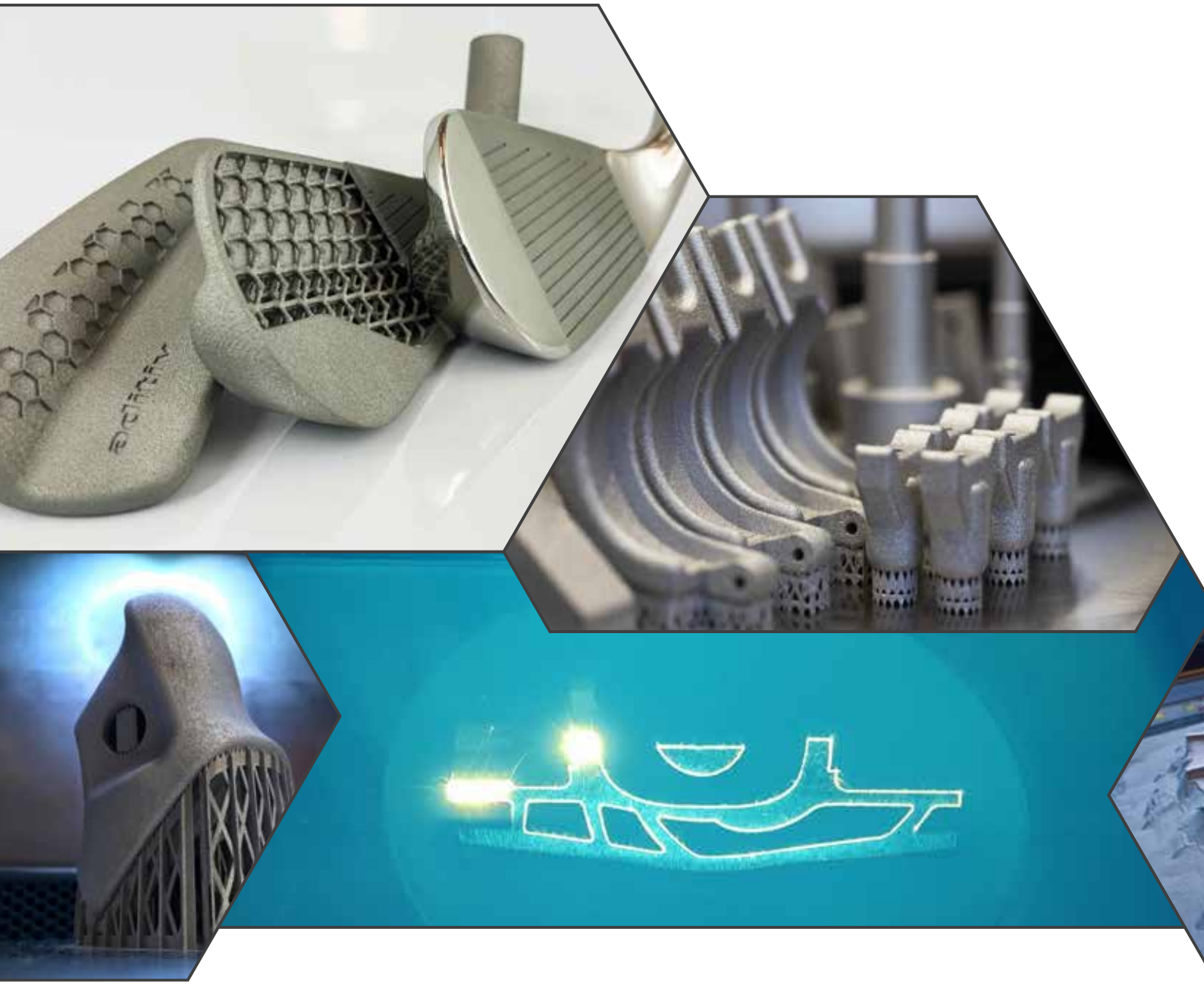
Company

Aditiv Solutions specialises in the design and manufacture of laser-based metal 3D printing machines. We focus on improving the cost efficiency of metal 3D printing, making the technology accessible to more industries. Our 3D printers allow for the manufacturing of intricate parts for end-use applications in a wide range of industries.

We pride ourselves on only making use of best-in-class optical systems to ensure machine reliability and repeatability. Our open architecture grants you complete access to process parameters and we have no restrictions on raw material suppliers.

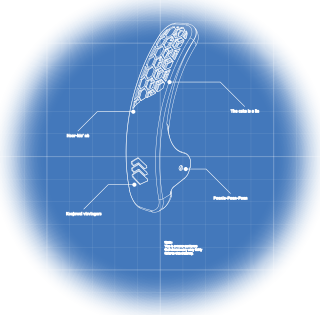
Our flagship printer, the Hyrax, is designed to be the perfect production tool for small- to medium sized parts while being equally suited to academic and R&D purposes. The machine can be operated in most environments since it fits through a standard single door, runs from single phase power and doesn't need any cooling or compressed air.

Our dedicated engineering team has more than 25 years of experience in the field of metal 3D printing. We love to work closely with our clients to ensure that our solutions are tailored to your needs.

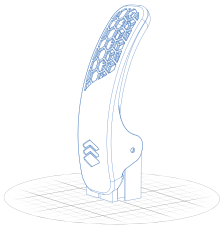


Technology

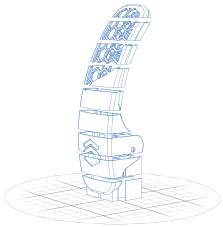
The Hyrax utilises Powder Bed Fusion (PBF) technology
to manufacture intricate metal parts
directly from a 3D digital model.



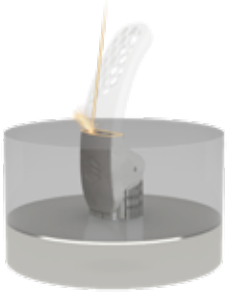
Design a 3D model in CAD software



Generate supports to anchor part to a base



Part is digitally sliced into thin 2D layers



The laser melts a layer of powder for each 2D slice

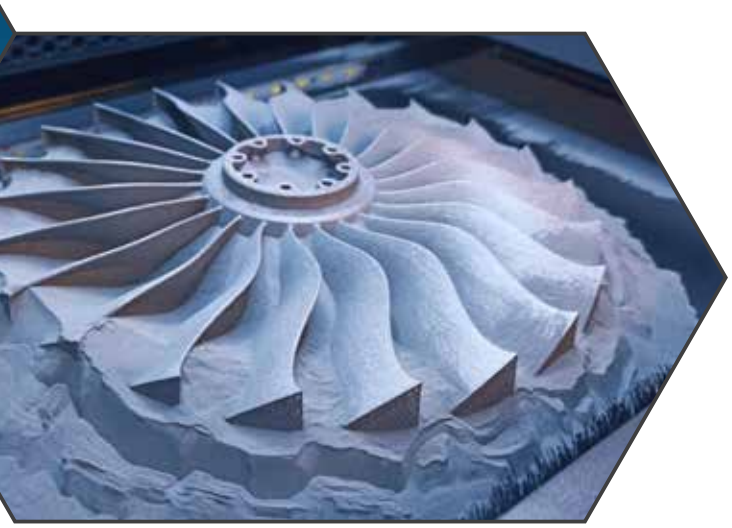
A near-net shape part is produced with excellent mechanical properties

Why would I use metal 3D printing?

Due to the layer-based manufacturing approach of the PBF process, complex geometries can be achieved. This provides engineers and designers more freedom to design parts which were traditionally difficult/costly to manufacture.

This allows for:

- Lightweight designs
- Intricate- and/or internal features
- Minimisation of waste
- Toolless manufacturing
- Improved part functionality
- Use of exotic materials
- Part count reduction



How can the Hyrax benefit me?

Powder Bed Fusion affords the ability to produce parts directly from CAD without the need for tooling. This changes the manufacturing landscape and creates new opportunities and business cases in various industries.

Examples include:

- On-demand manufacturing
- Shorter value chains
- Reduced lead times
- Production of discontinued spare parts
- Cost effective low-volume production runs
- Custom or personalised parts

Which materials can I use?

The Hyrax allows you to use a wide range of materials. Many commercially available metal powders can be used in the PBF process.

Most common materials:

- Stainless steels
- Tool steels
- Nickel alloys
- Titanium alloys
- Aluminium alloys
- Cobalt Chrome

Hyrax metal 3D printer

Process reliability

The highest quality German optical systems are employed to ensure build-consistency and accuracy.

Efficiency

The high-power 400W laser and high-speed scanning system provide excellent production rates for a range of metals.

Resolution

The minimum layer thickness is 30µm and minimum spot size is 90µm. This strikes a great balance between resolution and production rate.

Operating environment

The machine has a small footprint which makes it perfect for most manufacturing environments.

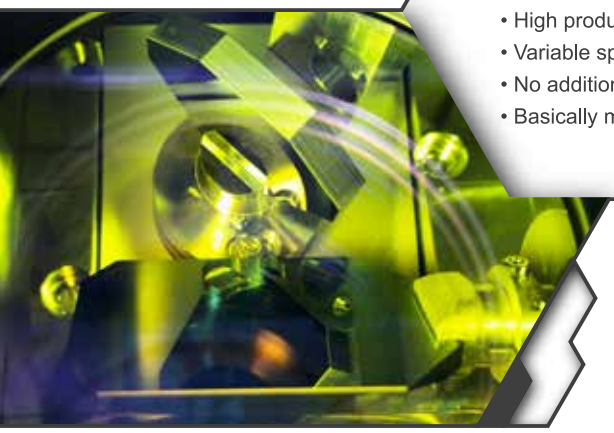
Value

In its range, the Hyrax is the most cost-efficient metal printer on the market.

Hyrax features

Optical systems

- Best-in-class German optical systems
- High productivity at excellent resolution
- Variable spot size (single-mode fibre laser)
- No additional cooling required (air cooled)
- Basically maintenance-free

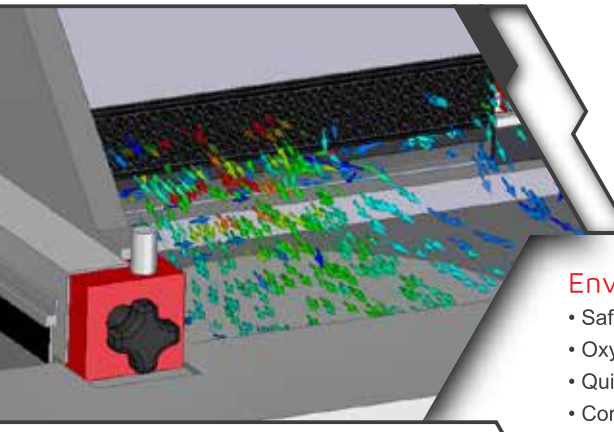


Machine interface

- Intuitive and interactive controls
- Built-in process monitoring camera
- Real-time 2D/3D views of print models
- Advanced multi-touch operator interface
- Continuous recording of parameters and events

Powder handling

- Operator-friendly powder handling
- Easy to change between materials
- Gravity-fed powder system
- In-process powder reloading
- “Low powder” warning system

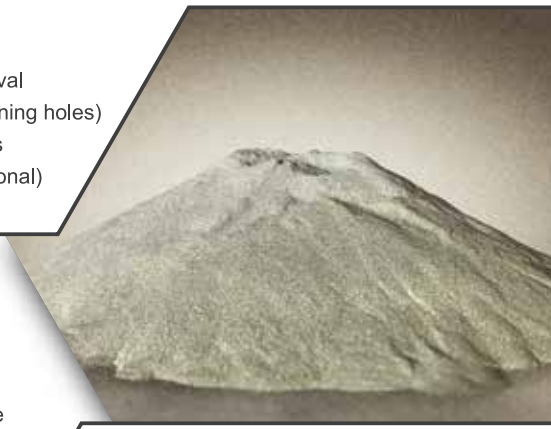


Environmental control

- Safe and easy filter replacement
- Oxygen monitoring (ppm level)
- Quick purging reduces setup costs
- Continuous filtration of process gas
- Low gas consumption (Argon/Nitrogen)

Optimised configuration

- Bi-directional powder scraping
- Rapid build plate installation/removal
- Full build plate utilisation (no fastening holes)
- Plug-and-play powder dosing units
- Build reduction unit available (optional)



Open architecture

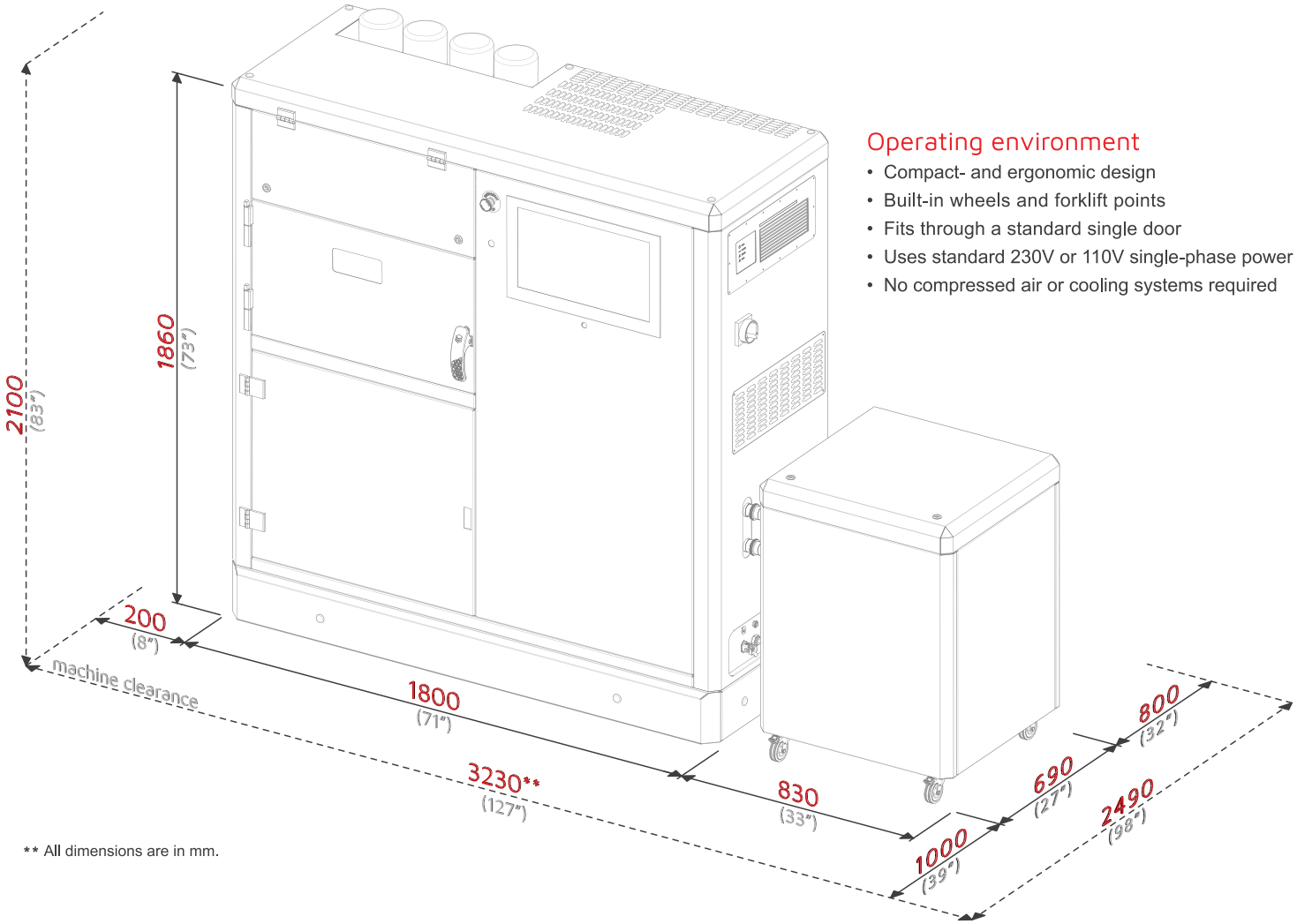
- Full access to process parameters
- Process any metal 3D printing powders
- No restriction on raw material suppliers
- Includes parameter development module
- Perfect for production and R&D applications

Hyrax technical specifications

Technology type	Laser-based Powder Bed Fusion (L-PBF)
Build volume	Ø 200 mm x 300 mm
Laser source	Yb single mode fibre laser (1070 nm)
Laser power	400 W Continuous Wave (CW)
Optical system	Post objective galvo scanner
Max scan speed	11 m/s *
Beam focus diameter	90 - 400 µm
Layer thickness	>30 µm
Min feature size	170 µm

Inert gas	Argon/Nitrogen
Inert gas supply	5 - 8 bar
Inert gas consumption	<0.2 l/min (in process) 20 l/min for 30 min (during purging)
Electrical supply	200 - 240 VAC, 50 Hz, Max 20 A 110 - 120 VAC, 60 Hz, Max 40 A (optional)
Power consumption	Max 2 kW
Communications	Ethernet, WiFi 802.11, USB
Software	Aditiv build processor Process development toolkit
Nett Weight	920 kg (machine) 100 kg (pre-filter)

* Max positioning speed of the optical system.
Actual scan speed is dependent on material type and processing parameters.



** All dimensions are in mm.

Operating environment

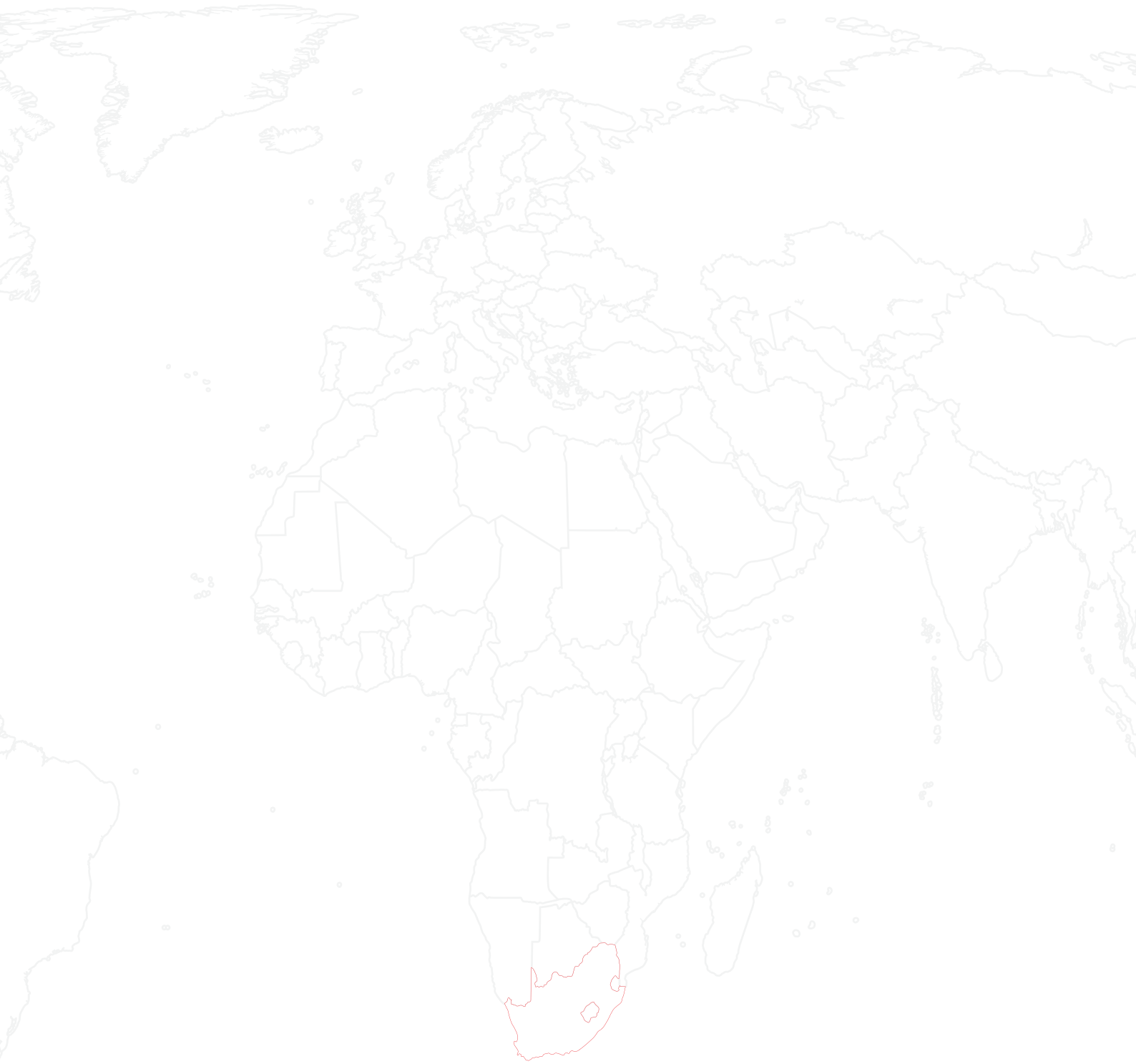
- Compact- and ergonomic design
- Built-in wheels and forklift points
- Fits through a standard single door
- Uses standard 230V or 110V single-phase power
- No compressed air or cooling systems required

Supporting peripherals

We have a range of equipment and services available to provide you with a turnkey solution.

Optional extras

- Maintenance contract
- Metal powder
- ATEX-approved vacuum cleaner
- Powder flow testing kit
- Powder sieving station
- Powder drying oven
- Build reduction unit
- Backup solar- and/or UPS unit



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