2024 **EN**

Additive manufacturing of cemented carbide

CERATIZIT is a high-technology engineering group specialised in cutting tools and hard material solutions.

Tooling a Sustainable Future

ceratizit.com

CERATIZIT GROUP

Turn the impossible into reality.
This technology allows designers to think in completely new forms and shapes.

3D printed cemented carbide: you imagine it, we make it

The CERATIZIT Group is a **pioneer and innovation leader** in carbide research, as well as in the production and application of cemented carbide parts. We always closely analyse the latest market trends so we can offer you the optimal solution for your application.

30 % of products developed in the last 5 years

200 R&D employees

1 000 patents & utility models

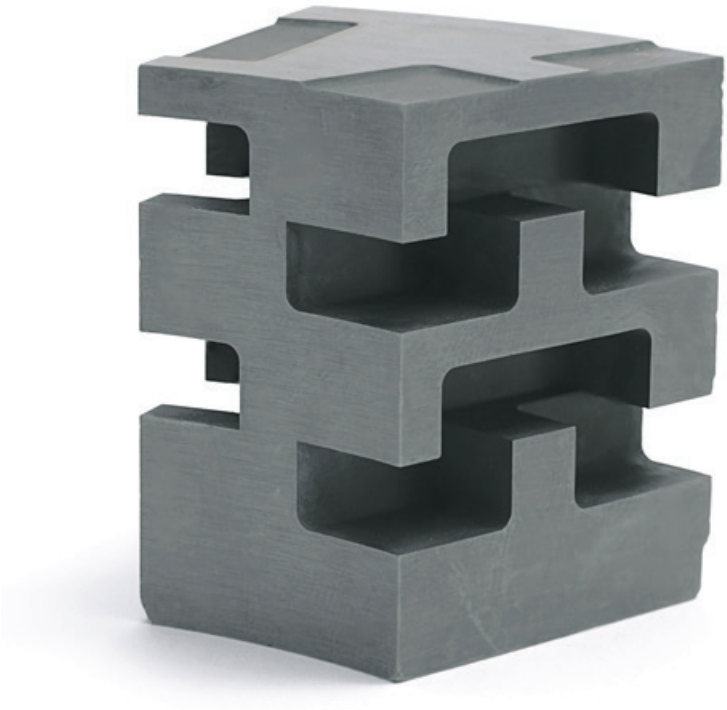
25 innovation awards

That is why we have developed additive manufacturing technologies for our tried and tested cemented carbide grades which are ready to use for your product.

What is additive manufacturing?

▲ Additive manufacturing or 3D printing is a manufacturing process that successively adds layers of materials to make products from a 3D data model.

▲ This process is the opposite of conventional production processes like machining or casting, where material is removed to create a specific form or poured into a mould and shaped by using dies, presses and hammers.



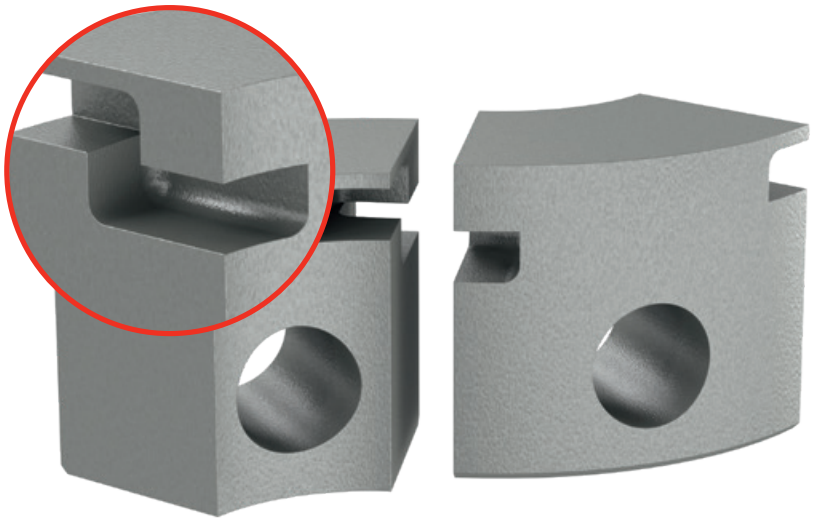
Additive vs. conventional manufacturing: turn the impossible into reality

The properties of 3D printed parts are comparable to conventionally produced cemented carbide products.

Furthermore, additive manufacturing technologies allow designers to think in completely new forms and shapes, as it pushes the limits of the production process: **you imagine it, we make it.**

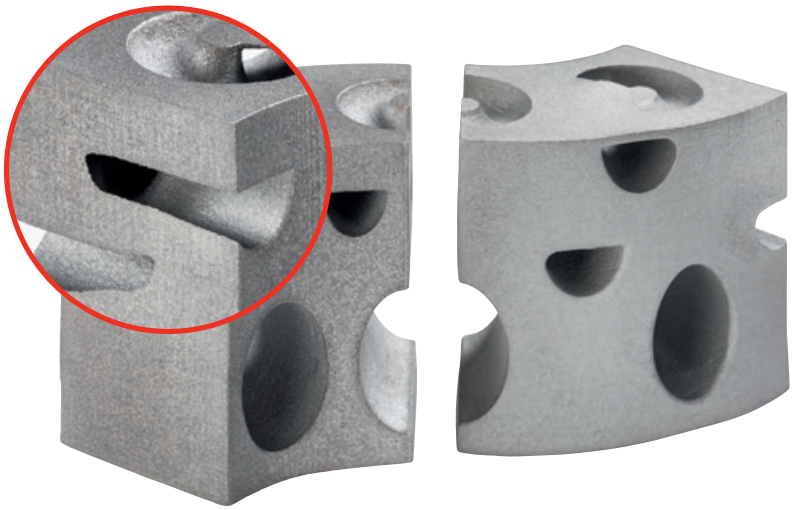
Conventionally manufactured parts:

▲ Limited possibilities for designing the inner structure



Additive manufactured parts:

▲ Brand new, up till now impossible to produce, with nearly unlimited possibilities for designing the inner structure



Your advantages at a glance

The properties of 3D printed parts are comparable to conventionally produced cemented carbide products. However, they have some **significant advantages:**

3D printing provides new technological possibilities to overcome the existing limitations of conventional manufacturing processes.

From batch size 1 to serial parts

Realisation of individual parts, from batch size 1 on. This is especially advantageous for prototyping so you can do fast tests and improve designs.

Grades: from nano to coarse

Wide range of materials from nano-grain size to extra-coarse.

Having a wide variety of grades enables greater customization to fulfil specific requirements. This flexibility allows for fine-tuning the balance between hardness and toughness to match different machining environments.

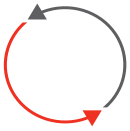
High complex shapes possible

Shapes can be re-designed and optimised, which is especially interesting for complex shapes or for altering properties such as weight or size.

Moreover, this technology allows easy customisation of parts without the need for expensive tooling changes.

Light weight parts

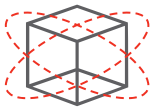
The technology allows for the sparing of material in areas where it's not needed, including the product's internals. This can lead to a significant reduction in material usage, and therefore, a decrease in weight and total power consumption needed for manufacturing.



Sustainable manufacturing

The manufacturing process is sustainable as there is less waste of material.

Additionally, the ability to produce parts on demand can contribute to more sustainable manufacturing practices.



Rapid prototyping

The risk of errors when designing a new product is reduced, which saves a lot of money as it can become very expensive in case manufacturing equipment needs to be modified.

We manage the entire process chain

CERATIZIT is one of the few carbide manufacturers who manages the entire process chain single-handedly.

Cemented carbide parts that are produced by additive manufacturing technologies can be an economical substitution for high-performance materials. Thanks to the hardness of cemented carbide, your tools and components will have a much longer tool life and your productivity will increase.

CERATIZIT Group

For over 100 years, CERATIZIT has been a pioneer in developing exceptional hard material solutions for machining and wear protection. The private company, with registered offices in Mamer, Luxembourg, develops and produces highly specialised cutting tools, indexable inserts, rods made from hard materials and wear parts.

The CERATIZIT Group is the global market leader in various application segments and successfully develops new carbide and cermet grades, such as for wood and stone working.

Facts & figures

Headquarters

Mamer, **Luxembourg**

30 production sites

30 % of products developed in the last 5 years

2 00 R&D employees

80 countries in which we are active

7 000 employees

25 innovation awards

1 000 patents & utility models

1 00 000 products

€ 1.5 bn turnover

Sustainability is not a goal, it’s a mission

Together for Sustainability

Advantages of additive manufacturing

Material efficiency

There is no need in the case of effort-intensive technologies (grinding, EDM, cutting, laser ablation) to re-shape parts that normally generate large amounts of sintered waste.

Thanks to cemented carbide additive manufacturing technologies, we can produce partly hollow parts and thus save material in contrast to other forming technologies.

New raw material thanks to recycling

CERATIZIT has mastered the recycling process thanks to its in-house expertise with more than 200 research & development employees. Whether the material comes from thermal zinc recycling, chemical recycling or even carbide scrap recycling, there is no difference in quality compared to products made from primary raw materials.

The recycling rate is planned to be further increased across all product groups to over 95% by 2030 for sintered products.

upGRADE

More than 99% of the raw material used in upGRADE CT-GS20Y comes from optimised recycling processes, meaning the material used is not obtained from ores, but rather secondary raw materials.

Example of an additively manufactured hollow printed part, saving up to 91% on material.

Leading in sustainability by 2025

Our mission is just as clear as it is difficult to accomplish. By 2025, we aim to be the sustainability leader in the hard metals and cutting tool industry. To meet this ambitious goal and become truly sustainable, we are implementing an array of sustainability measures along the entire value chain. However, we're not just keeping our sustainability ethos in-house, for it will help set new standards for cooperating with partners moving forward.

Climate neutral by 2025

We recognise our responsibility to be good stewards to the climate and are going to great lengths to keep our carbon footprint to a minimum. The United Nations' Sustainable Development Goals aim to achieve net-zero carbon emissions by 2050. We think we can do better and aim to be net-zero by 2040.

- **By 2025:** Climate neutral, emissions reduced by 35 %
- **By 2030:** Combined reduction of 60 %
- **By 2040:** Net zero, emissions reduced by 75 %

Reduce the use of virgin raw materials

To reduce the mining of virgin raw materials, our mission is to increase the share of raw materials remaining in the carbide production chain to more than 95% by 2030 (based on scrap recycling rates of sintered products).

Read more about our sustainability approach on our website.
ceratizit.com

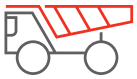
Passion for cemented carbide

From the ore to the ready-to-use-tool

CERATIZIT is one of the few carbide manufacturers who manages the entire process chain single-handedly: from ore extraction to the ready-to-use product. In the different areas that are involved, our highly qualified experts are familiar with every single step of the production process. With our ultra-modern machine park and great manufacturing depth, we guarantee that you will be able to count on a strong partner.

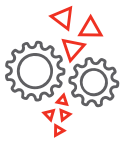
To ensure the high quality of our products and track the environmental impact of our production methods, our management system is certified to DIN ISO 9001 standards. What this means for you is that you will find the sum of all the skills of the entire CERATIZIT Group combined in each one of our products

We manage the entire process chain



Mineral extraction

Worldwide extraction of scheelite and wolframite ore with selected business partners to ensure a responsible raw material sourcing.



Preparation and mixing of the raw materials

Powder and grades manufacturing, management & control

Forming / pressing / printing

All existing shaping technologies available (extrusion, direct pressing, isostatic pressing, handshaping)

Sintering

Several decades of experience in calculating the exact sinter shrinkage, ensuring high quality of the final product

Surface treatment

Different finishing available including OD grinding, cutting, chamfering

Quality assurance

All products are subject to strict quality control by experienced professionals

Dispatch

Automated high-tech shuttle Warehouse

Recycling

We organize the entire process for you and also provide free, quantity-specific collection containers and transport solutions.

Our services for you

Our experts will be happy to assist you in the following areas:

- ▲ Material selection
- ▲ Design adaptation for additive manufacturing
- ▲ Modelling and simulation support
- ▲ Additive manufacturing: different processes possible, depending on your requirements
- ▲ We will help you choose the right technology for your product
- ▲ Post-processing services such as product finishing

We are looking forward to hearing about your challenges and finding the best solution for your application.

Want to know more? Contact us at am@ceratizit.com

Headquarters

CERATIZIT S.A.
LU-8232 Mamer
T. +352 31 20 85-1
ceratizit.com

7003972
MA-PRO-0812-EN-09/24

CERATIZIT GROUP