GRAPHENE.

INTELLIGENCE
IN
GRAPHITE

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GRAPHENE.

INNOVATION - CREATING THE FUTURE

Like graphite, graphene is a pure carbon modification whose structure consists of two-dimensional sheets of aromatic carbon. The individual carbon atoms are hexagonally arranged and form a wrinkled surface.

The first synthesis of graphene was made in the late 19th century, unfortunately without any precise characterization. Based on its promising properties, the general interest on graphene increased rapidly.

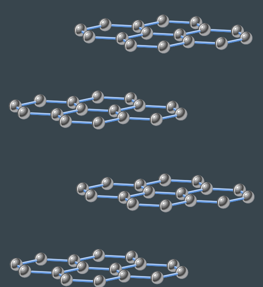
After fullerenes in 1995 and carbon nanotubes in 2000, graphene has become the hype carbon material in physical science. In 2004 graphene has been studied again by the physicists Andre Geim and Konstantin Novoselov. Finally in 2010, they won the Nobel Prize in Physics for their characterisation of graphene and the derivation method of its special physical properties.

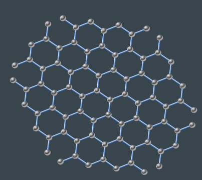
PROPERTIES

For specific applications, the term graphene is divided into the subgroups Single-Layer-Graphene (1 layer) and Few-Layer-Graphene (2 to 8 layers), which denote the mean number of layers present in stucked packages. Due to the following versatile properties, graphene would be a material of choice in the future:

- Stronger than steel
- A million times thinner than a human hair
- Harder than diamond
- A super conductor of electricity and heat
- Extremely elastic and transparent

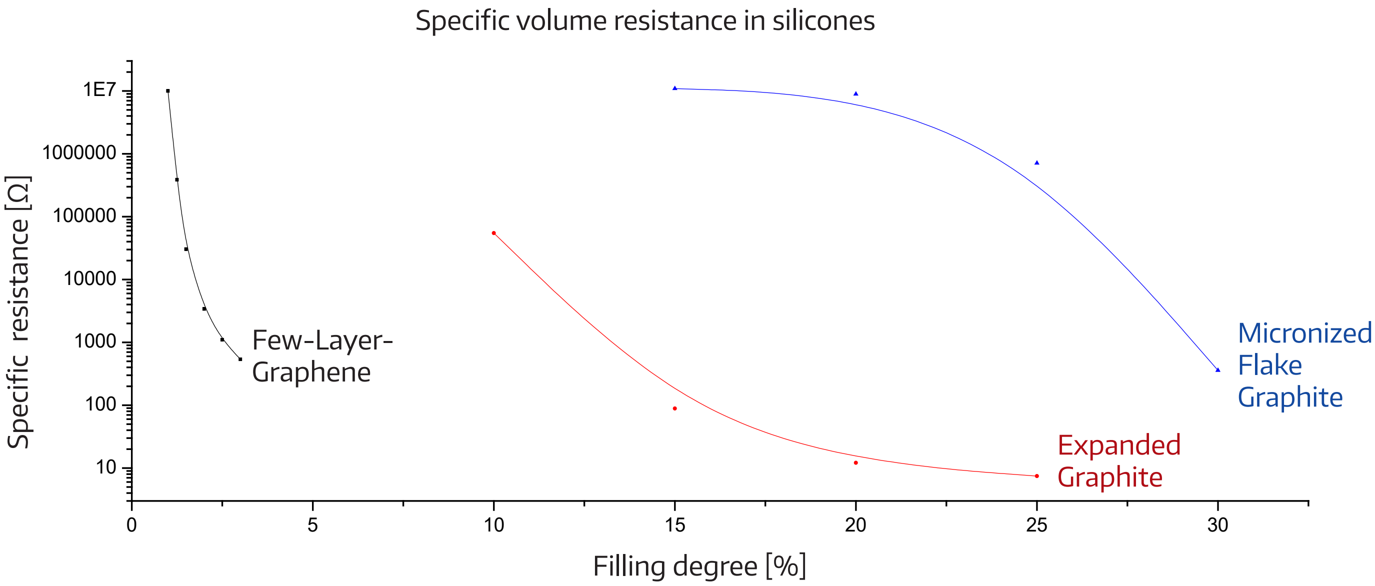
GRAPHITE VS. GRAPHENE





SPECIFIC VOLUME RESISTANCE IN SILICONES

As an expample of improving the electrical and thermal conductivity of composites, Graphit Kropfmühl has developed a Few-Layer-Graphene (FLG) based grade, showing the following conductivity values in a non-conductivity matrix of silicone.

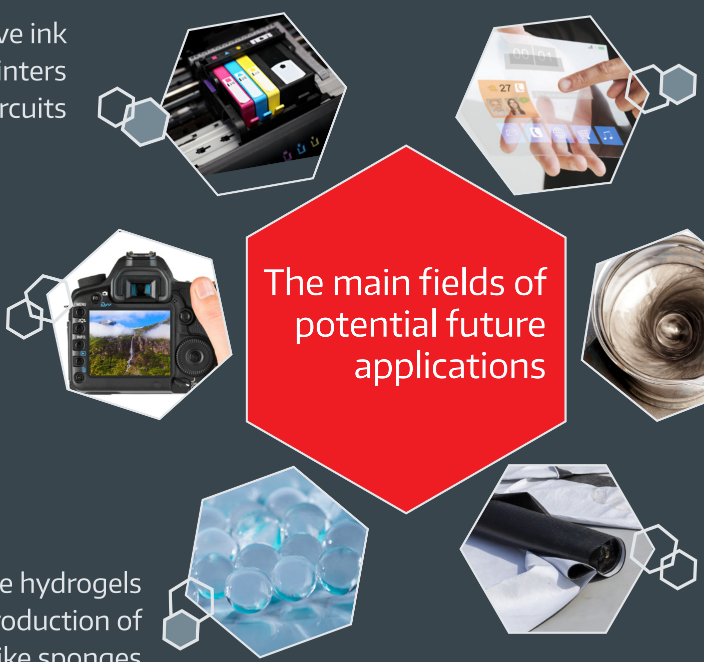


Graphit Kropfmühl is developing an upscalable synthesis method for FLG with a specific surface of 250 to 400 m^2/g. Graphit Kropfmühl is also involved in research projects exploiting the special properties of this material. Our purpose is to implement a validated concept for the production of FLG for the usage in several industries.

THE MAIN FIELD OF FUTURE APPLICATIONS

Electric conductive ink usable in inkjet printers for electrical circuits

Thin-film transistors: vertical field-effecttransistors



Ultra-thin energy efficient lighting (e.g. in displays, cameras etc.)

Better processing and creating extremely stable dispersions

Graphene hydrogels useful for production of macrostructures like sponges

Impermeable membrane: efficient release films, rain gear, gas filter, electro-mechanical switches

OUR PRODUCT PORTFOLIO

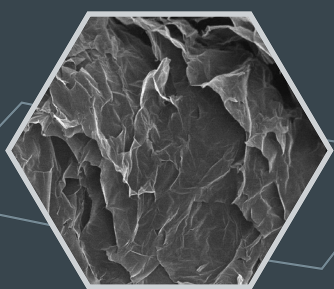
GRAPHENE AGGLOMERATES					BASIC RAW MATERIAL		
GRADE	PARTICLE SIZE [µm] - TYPICAL VALUES OF GRAPHENE - AGGLOMERATES			BET [m²/g]	PARTICLE SIZE STARTING GRAPHITE [µm]		
	d_{10}	d_{50}	d_{90}		d_{10}	d_{50}	d_{90}
EXG R 98 300	9	24	52	> 300	> 500	> 500	> 500
EXG S 98 300	10	26	50	> 300	8	20	42
EXG U 98 300	5	11	23	> 300	2	4 - 5	8

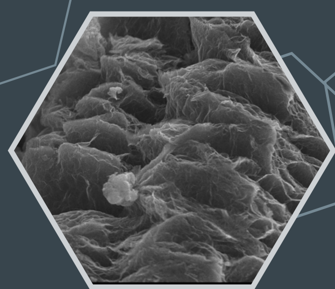
If you have special requirements, Graphit Kropfmühl offers tailor-made solutions in line with customer needs. Please don't hesitate to contact us.

Graphit Kropfmühl stands for:

- Customised solutions
- Quality assurance
- Long-standing experience
- Focused R&D work

We deliver graphite tailored to your demands and in different types of packaging. Quality is controlled according to a detailed quality control plan. The typical forms of packaging are paper bags, shrink wrapped on pallets and big bags. Other types of packaging and transport can be arranged on request.





Graphit Kropfmühl GmbH
Langheinrichstr. 1
94051 Hauzenberg
GERMANY
T: +49(0)8586 609-0 | F: -112
info@gk-graphite.com
www.gk-graphite.com

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