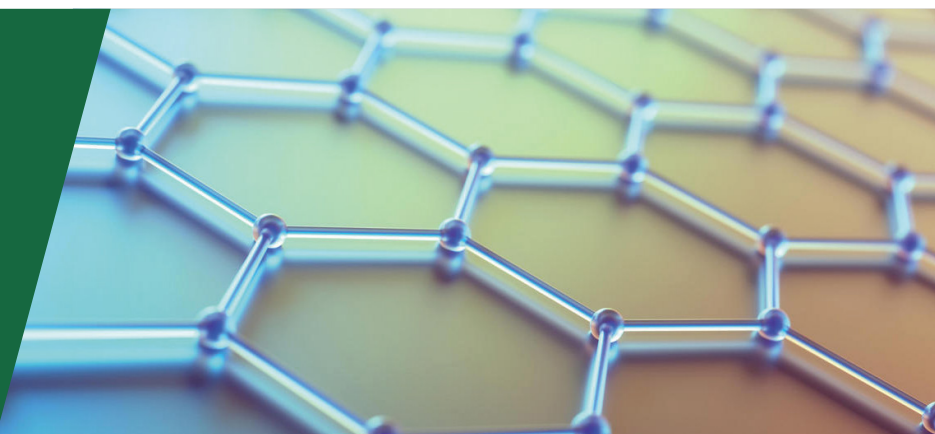




# Product Brochure



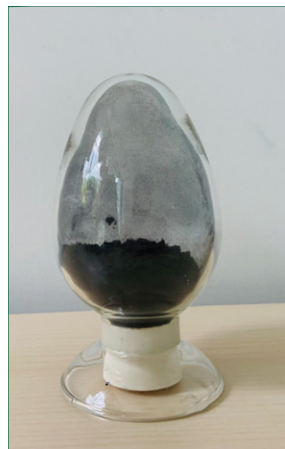
Graphene products



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# Graphene Powder



This product uses natural graphite as raw material and processed by chemical reoxidation process to obtain reduced graphene oxide rGO. It has the advantages of high purity, large specific surface area and high stability, and has good compatibility with organic and inorganic materials, is easy to disperse and grind. It is used with polymer composite materials, coatings, coating materials and lubricating materials.

Model	MSTN-RGOP
Active ingredient content	96%
Import or not	No
Storage conditions	Keep closed in a cool, ventilated and dry environment
Packaging specifications	50ml/ bottle, 100ml/ bottle, 250ml/ bottle, 500ml/ bottle, 100ml/ bottle kg
Standard	GB/T 40066
Origin	Beijing, Xiamen
Industrial grade graphene oxide	content > 96%, layer number < 5
Storage temperature	5~35°C
Product name	Graphene oxide powder
Thickness	2~3nm
Application	composite material field, biomedicine field, antiseptic field Packaging specifications :5g/ bottle, 10g/ bottle, 20g/ bottle, 50g/ bottle
Carbon content	82%
Oxygen content	10%
Sulfur content	< 1.5%
BrandProduct advantages	good hydrophilicity, adsorption and mechanical properties

## ► Product Attributes

### Specifications

5g/ bottle, 10g/ bottle, 20g/ bottle, 50g/ bottle

### Powder Parameters

Aspect	Black fluffy powder
Thickness	2~3nm
Carbon content	~82
Oxygen content	~10
Lamellar diameter	0.5-5 um
Ash content	1%

**Origin-** Beijing, Xiamen    **Brand** -MSTN    **Model-** Mstn-RGOP    **Price-**Negotiable    **Customizable**

## ► Product Advantages

- High specific surface energy, good hydrophilicity, adsorption and mechanical capacity.
- Good dispersion stability in water and most polar organic solvents.
- Good wettability and surface activity, can be stripped by small molecules or polymer intercalation.
- It can improve the thermal, electrical, mechanical and other comprehensive properties of materials.
- Electrical conductivity: Compared with GO, the defects introduced by the oxidation process were largely repaired by the reduced GO, and the electrical conductivity was significantly improved.
- The powder of reduced GO is treated by special process, and the powder remains fluffy and has a high specific surface area.
- Compared with conventional graphene, RGO also protects some oxygen-containing functional groups, and is significantly better than GO in terms of stability. As an adsorption material, it has a very obvious effect on the adsorption of heavy metals and organic dyes.

## ► Application Scene

► Used in adsorption materials, thermal insulation materials, polymer composite materials, coating, coating materials and lubricating materials and other fields.



► Used in the field of antistatic

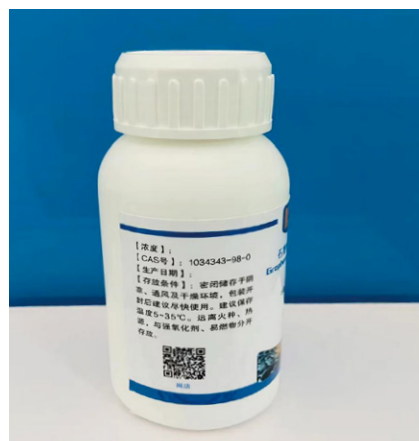


► Used in anticorrosive series.

## ► Disposal and Storage

Operators should wear appropriate protective clothing and gloves, avoid direct contact with skin, and immediately rinse with plenty of water once entering eyes. Store tightly in a cool, ventilated and dry environment. Use as soon as possible after unpacking. The recommended storage temperature is from 5 to 35°C. Keep away from tinder and heat source, and store separately with strong reducing agent and flammable substance.

# Graphene Dispersion Liquid



Product Description: This product uses natural graphite as raw material and is treated by chemical reoxidation process to obtain reduced graphene oxide rGO. It has the advantages of high purity, large specific surface area, high stability, good compatibility with organic and inorganic materials, is easy to disperse and grind. It is suitable for polymer composite materials, coatings, coating materials and lubricating materials.

Model number	MSTN-RGOD
Active ingredient content	96%w
Import or not	No
Storage conditions	Keep closed in a cool, ventilated and dry environment
Packaging specifications	50ml/ bottle, 100ml/ bottle, 250ml/ bottle, 500ml/ bottle, 100ml/ bottle kg
Application	composite material field, biomedicine field, photocatalysis field, analysis field
Processing customization	Yes
Dispersion	deionized water, ethanol
Dispersion concentration	0.5 ~ 10mg/ml
Single-layer rate	> 98%
Thickness	0.6~1.0nm
Lamellar diameter	0.5-5 um
Origin	Beijing, Xiamen
Price	Negotiable
Color	Brown/black
pH value	5 ~ 7
Storage temperature	5~35C
Brand	MSTN

## ► Product Attributes

### Concentration

0.5mg/mL, 1mg/mL, 2mg/mL, 5mg/mL, 10mg/mL

### Packaging specifications

50ml/bottle 100ml/bottle 250ml/bottle 500ml/ bottle 1000ml/ bottle

### Dispersion Liquid Parameters

Dispersant	Deionized water, ethanol, NMP, etc
Colour	black
Ph Level	5 ~ 7
Dispersion Concentration	0.5 ~ 10 mg/ml
Single-Layer Ratio	> 98%
Thickness	0.6 ~ 1.0 nm
Lamellar Diameter	0.5-5 um

## ► Product Advantages

- Dispersants: Optional dispersants include water, ethanol, NMP, etc.
- Electrical conductivity: Compared with GO, reduced GO largely repaired the defects introduced by the oxidation process, and the electrical conductivity was significantly improved.
- The powder of reduced GO is treated by special process, and the powder remains fluffy with high specific surface area.
- Compared with conventional graphene, reduced GO still retains some oxygen-containing functional groups, and is significantly better than GO in terms of stability. As an adsorption material, it can adsorb heavy metals and organic dyes with very obvious effect.
- It has good dispersion stability in water and most polar organic solvents.
- Good wettability and surface activity, can be stripped by small molecules or polymer intercalation.
- It can improve the thermal, electrical, mechanical and other comprehensive properties of materials.

## ► Application Scene

► Used in adsorption materials, thermal insulation materials, polymer composite materials, coating, coating materials and lubricating materials and other fields.



► Used in the field of antistatic



► Used in anticorrosive series.

## ► Product Standard

We can provide infrared, XPS, Raman, XRD, TGA, SEM, TEM analysis and test report of this batch of products.

## ► Disposal and Storage

Operators should wear appropriate protective clothing and gloves, avoid direct contact with skin, and immediately rinse with plenty of water once entering eyes. Store tightly in a cool, ventilated and dry environment. Use as soon as possible after unpacking. The recommended storage temperature is from 5 to 35°C. Keep away from tinder and heat source, and store separately with strong reducing agent and flammable substance.



# Graphene Oxide Powder



Product description: Graphene oxide is the introduction of oxygen-containing functional groups, such as hydroxyl, carboxyl, epoxy, etc., on a single sheet of graphene. Therefore, it is more active than graphene and is easy to graft modification. It can be remixed with composite materials in situ, thus giving the composite materials conductive, thermal, strengthening, flame retardant, antibacterial, antibacterial and other properties, and has good hydrophilicity. After reduction, oxygen-containing functional groups can be removed, which is an important precursor of graphene.

Model	MSTN-PGO
Active ingredient content	96%
Import or not	No
Storage conditions	Keep closed in a cool, ventilated and dry environment
Packaging specifications	50ml/ bottle, 100ml/ bottle, 250ml/ bottle, 500ml/ bottle, 1000ml/ bottle kg
Standard	GB/T 40066
Origin	Beijing, Xiamen
Industrial grade graphene oxide	content > 96%, layer number < 5
Storage temperature	5~35 C
Product name	MSTN high purity GO powder
Product specifications	5g/ bottle, 10g/ bottle, 20g/ bottle, 50g/ bottle
Carbon content	46%
Oxygen content	46%
Application	anti-corrosion field, analysis and detection field, anti-corrosion field
Product advantage	It can improve the thermal, electrical, mechanical and other comprehensive properties of materials.
Hydrogen content	0-1%

## ► Product Attributes

### Standard

GB/T 40066-2021 "Nanotechnology Graphene Oxide Thickness Measurement Atomic Force microscopy method"

### Industrial grade graphene oxide

content > 96%, layer number < 5 layers

### Specifications

5g/ bottle, 10g/ bottle, 20g/ bottle, 50g/ bottle

### Product Element Content

Name	Content
Carbon Content	46%
Hydrogen Content	0-1%
Nitrogen Content	0-1%
Sulphur Content	<1.5%
Oxygen Content	46%

**Origin-** Beijing, Xiamen

**Brand** -MSTN

**Model-** MSTN-PGO

**Price-**Negotiable

**Customizable**

## ► Product Advantages

- High specific surface energy, good hydrophilicity, adsorption and mechanical capabilities.
- Good dispersion stability in water and most polar organic solvents.
- Good wettability and surface activity, can be stripped by small molecules or polymer intercalation.
- It can improve the thermal, electrical, mechanical and other comprehensive capabilities of materials.

## ► Product Functions

- Composite material field: graphene oxide has excellent mechanical capabilities, good thermal conductivity and large specific surface area, which can be applied to rubber, plastic, resin, fiber and other polymer composite material field;
- Biomedical field: Due to its high specific surface area and wide range of conjugate structure, GO has good application value in drug loading, especially in the aspect of anticancer drug carrier. After technical treatment, GO can be supplemented with non-water-soluble anticancer drugs.
- In the field of photocatalysis: graphene oxide has good adsorption performance. Together with nanomaterials, it can prepare catalytic materials with better performance and higher catalytic efficiency, which can be applied to the photocatalytic industry to further improve the degradation efficiency of pollutants;
- Analysis and detection field: The application of GO in PCR technology can significantly improve the specificity, sensitivity and amplification yield of PCR, eliminate primer dimers formed in amplification, and have a wide optimization range, which can be widely applied to DNA templates of various concentrations and complexity;
- Anticorrosive field: Like graphene, graphene oxide has excellent anticorrosive properties, but also has more active sites than graphene, which is easier to modify and can be well dispersed in coatings;
- In the field of conductivity: although the conjugate network is damaged in the oxidation process, graphene oxide has certain insulation properties, but after reduction treatment, part of the conductivity can be recovered, which can meet the requirements of anti-corrosion coatings on conductivity, reduce or replace the use of metal filler;
- Thermal conductivity field: High thermal conductivity and large specific surface area lay the foundation for graphene oxide as a thermal conductivity material. Meanwhile, its active site improves its serviceability. Stable conjugate structure enables it to work at high temperature and prolongs the service life of the product.

## ► Disposal and Storage

Operators should wear appropriate protective clothing and gloves, avoid direct contact with skin, and immediately rinse with plenty of water once entering eyes. Store tightly in a cool, ventilated and dry environment. Use as soon as possible after unpacking. The recommended storage temperature is from 5 to 35°C. Keep away from tinder and heat source, and store separately with strong reducing agent and flammable substance.



# Graphene Oxide Dispersion Liquid



Product Description: Graphene oxide is the introduction of oxygen-containing functional groups, such as hydroxyl, carboxyl, epoxy etc., on a single sheet of graphene. Therefore, it is more active than graphene and is easy to graft modification. It can be remixed with composite materials in situ, thus giving the composite materials conductive, thermal, strengthening, flame retardant, antibacterial, antibacterial etc. functions, and it has good hydrophilicity. After reduction, oxygen-containing functional groups can be removed, which is an important precursor of graphene.

Model	MSTN-DGO
Active ingredient content	96%
Import or not	No
Storage conditions	Keep closed in a cool, ventilated and dry environment
Applications	composite materials, biomedicine, photocatalysis
Standard	GB/T 40066-2021
Specifications	50ml 100ml 250ml 500ml 1000ml
Concentration	0.5mg/mL, 1mg/mL, 2mg/mL, 5mg/mL, 10mg/mL
Industrial grade graphene oxide	content > 96%, layer number < 5
Color	Brown/black
PH value	5~7
Dispersion concentration	0.05 ~ 50 mg/ml
Storage temperature	5~35°C
Origin	Beijing, Xiamen
Brand	MSTN

## ► Product Attributes

### Standard

GB/T 40066-2021 "Nanotechnology Graphene Oxide Thickness Measurement Atomic Force microscopy Method"

### Concentration

0.5mg/mL, 1mg/mL, 2mg/mL, 5mg/mL, 10mg/mL

### Packaging specifications:

50ml/bottle, 100ml/bottle, 250ml/ bottle, 500ml/bottle, 1000ml/ bottle

### Industrial grade graphene oxide

content > 96%, layer number < 5 layers

### Dispersion Liquid Parameters

Dispersant	water, ethanol, NMP, etc
Color	brown/black
PH level	5 ~ 7
Dispersion concentration	0.05-50 mg/ml
Monolayer rate	> 98%
Thickness	0.6 ~ 1.0 nm
Lamellar diameter	0.5-5 um

**Origin-** Beijing, Xiamen

**Brand** -MSTN

**Model-** MSTN-DGO

**Price-**Negotiable

**Customizable**

## ► Product Advantages

- The surface of GO is rich in oxygen-containing functional groups and has good dispersion stability in water and most polar organic solvents.
- Easy graft modification, it can be in-situ composite with composite materials, so as to give the composite materials conductive, thermal conductivity, strengthening functions.
- High specific surface energy, good hydrophilicity, adsorption and mechanical functions.
- Good wettability and surface activity, it can be stripped by small molecules or polymer intercalation.
- Can improve the thermal, electrical, mechanical and other comprehensive functions of the material.

## ► Product Functions

- **Composite material field:** graphene oxide has excellent mechanical capacity, good thermal conductivity and large specific surface area, which can be applied to rubber, plastic, resin, fiber and other polymer composite material field;
- **Biomedical field:** Due to its high specific surface area and wide range of conjugate structure, GO has good application value in drug loading, especially in the aspect of anticancer drug carrier. After technical treatment, GO can be supplemented with non-water-soluble anticancer drugs.
- **In the field of photocatalysis:** graphene oxide has good adsorption performance. Together with nanomaterials, it can prepare catalytic materials with better performance and higher catalytic efficiency, which can be applied to the photocatalytic industry to further improve the degradation efficiency of pollutants;
- **Analysis and detection field:** The application of GO in PCR technology can significantly improve the specificity, sensitivity and amplification yield of PCR, eliminate primer dimers formed in amplification, and have a wide optimization range, which can be widely applied to DNA templates of various concentrations and complexity;
- **Anticorrosive field:** Like graphene, graphene oxide has excellent anticorrosive properties, but it also has more active sites than graphene, which is easier to modify and can be well dispersed in coatings;
- **In the field of conductivity:** although the conjugate network is damaged in the oxidation process, graphene oxide has certain insulation properties, but after reduction treatment, part of the conductivity can be recovered, which can meet the requirements of anti-corrosion coatings on conductivity, reduce or replace the use of metal filler;
- **Thermal conductivity field:** High thermal conductivity and large specific surface area lay the foundation for graphene oxide as a thermal conductivity material. Meanwhile, its active site improves its serviceability. Stable conjugate structure enables it to work at high temperature and prolongs the service life of the product.

## ► Disposal and Storage

Disposal And Storage: Operators should wear appropriate protective clothing and gloves, avoid direct contact with skin, and immediately rinse with plenty of water once entering eyes. Store tightly in a cool, ventilated and dry environment. Use as soon as possible after unpacking. The recommended storage temperature is from 5 to 35°C. Keep away from tinder and heat source, and store separately with strong reducing agent and flammable substance.

# Graphene Based Oil Absorbing Sponge

By combining the lipophilic and hydrophobic graphene with ordinary commercial porous sponges, the graphene-based oil absorbing sponge is obtained. The graphene composite sponge not only has the high strength and high resilience of sponges, but also has the hydrophobicity of graphene. It can be used to deal with the oil leakage accidents in the process of oil exploitation, refining and transportation, as well as the organic solvent pollution used and discharged in the chemical industry. Graphene-based oil sponge can absorb 100 times its own weight of various oil and organic solvent pollutants. When the sponge is treated with oil spill pollution instead of oil absorbing felt, it can still float on the water surface after absorbing oil, which is easy to salvage and recycle, and it can be reused more than thousands of times.



○ Pictured above is a new graphene-based oil sponge with a graphene-based oil sponge that has been reused more than 1,000 times

## ► Product Attributes

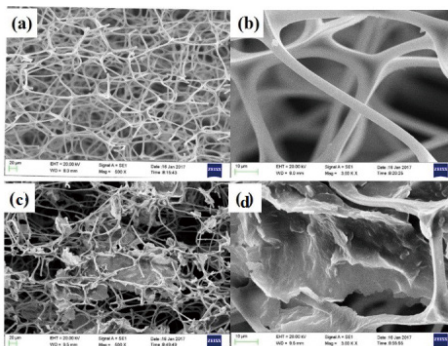
### Function

Can be used for oil slick, organic solvent recovery, which can be recycled by extrusion or negative pressure, after regeneration it can be reused.

### Specification

Size and shape can be customized.

Specification	20x10x3orΦ20	Origin	Beijing, Xiamen
Purpose	Oil slick recovery	Brand	MSTN
Length	Non-standard, customizable	Model	MSTN-GS
Diameter	Non-standard, customizable	Price	Negotiable
Material	graphene, sponge	Processing customization	Yes
Model	MSTN-GS	Color	Brown/black
Dimensions	Non-standard, customizable	Density	15~50kg/m <sup>3</sup>
Size	Non-standard, customizable	shape	Non-standard,customizable
Properties	Non-standard, customizable		



The above is the electron microscope scanning of the corresponding microstructure of blank sponge and graphene-supported sponge magnified 500 times (left) and 3000 times (right) respectively. Figure a and b show that the skeleton of blank melamine sponge is smooth and interwoven, forming multistage micropore structure with pore size ranging from tens to hundreds of microns. Therefore, oil or organic solvents can freely pass through the internal pores; The cross-linked skeleton structure of the sponge can also effectively support the weight of the adsorbed oil, giving the sponge a larger oil absorption capacity. According to the surface wetting theory, the material surface wettability is related to surface roughness and chemical properties. Because the blank sponge skeleton surface is smooth and flat, and contains a large number of hydrophilic groups, the oil-water separation selectivity is poor. As can be seen in Figure c and d, a large number of clumped and irregularly distributed graphene coatings appeared on the surface of the skeleton structure of the graphene loaded sponge. After local amplification, it could be clearly seen that there were crumpled protrusions with micro or nano size attached to the pore wall, which greatly increased the roughness of the sponge.



## ► Product Advantages

- Super hydrophobic, contact angle can be more than 150°
- The adsorption rate is high, the adsorption capacity of crude oil can reach 120 times of its own weight
- High desorption rate, up to 95%
- After repeated use, the adsorption rate remains high after up to thousands of adsorption-desorption



Graphene-based oil sponge water contact angle test diagram



Graphene-based oil sponge square



A graphene-based oil sponge ball with a diameter of 6cm

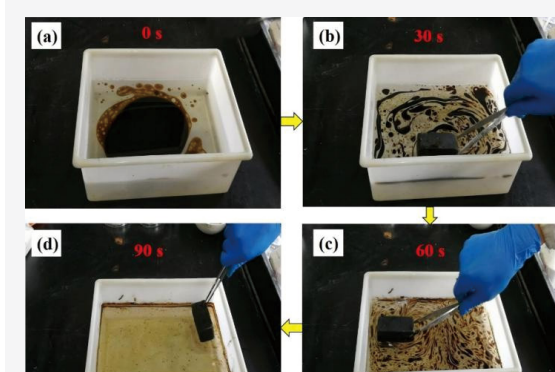


A graphene-based oil sponge ball with a diameter of 4cm



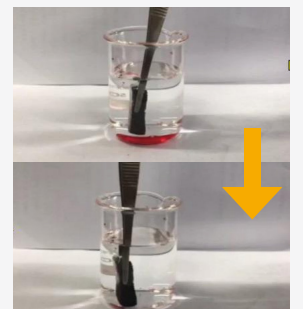
A graphene-based oil sponge ball with diameter of 2cm

## ► Product Advantages



- As shown in the figure above, add a simulated sea water containing 3.5% NaCl and pour 10 mL crude oil into the tank. A graphene-based oil sponge is held with tweezers and the oil on the water surface is absorbed back and forth. Under the action of the sponges' lipophilic and capillary forces, the crude oil from the water surface quickly penetrates into the sponges' pores. With the recovery process, the oil storage space of sponge gradually decreases, and the oil absorption rate decreases compared with the beginning. After 90s, most of the oil is recovered, and the sponge can continue to float on the water surface, which is conducive to salvage and recovery.

- The water bottom of the beaker is trichloromethane stained with Sudan Red III. Dip the graphene-based oil sponge into the water bottom, and the trichloromethane is immediately adsorbed without absorbing water. It can be seen that in addition to oil recovery on the water surface, graphene-based oil absorbing sponge also has good selective adsorption for underwater oil or organic solvent leakage, and can be applied in the field of underwater oil and water separation. Sponges are good at oil philicity and hydrophobicity, and have strong selective absorption for heterogeneous oil-water mixing systems. They have great advantages in waters where large mechanical recovery equipment is difficult to operate, such as shoals and river-banks.





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