

Quickclean<sup>®</sup>

Safe and Effective Hemostasis For Emergency Bleeding Control

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Quickclean<sup>®</sup>

Diatomite Hemostatic Granules  
For Emergency Bleeding Control



- Safe
- Rapid
- Convenient
- Effective For Arterial And Venous Bleeding

# Quickclean® Introduction

Quickclean® Diatomite Hemostatic Granules represent a breakthrough in hemostatic technology. As China's first hemostatic product derived from marine-cultivated diatoms, it also sets a leading standard globally.

Produced through a bio-based process involving controlled cultivation, granulation, and high-temperature calcination, the granules are white or off-white with a water absorption rate  $\geq 60\%$ . This product is sterilized by irradiation and is for single use only.



## Indication

Used for hemostasis of non-chronic surface wounds.

## Specifications

- 5 g / bag × 10 bags / box
- 10 g / bag × 10 bags / box



## Scenario

Used for emergency hemostasis before hospitalization.



Military



Traffic Accident



Major Emergencies



High-Risk Occupations



Outdoor Sports



Home Emergency Kit

## Trauma Type



Extensive wounds



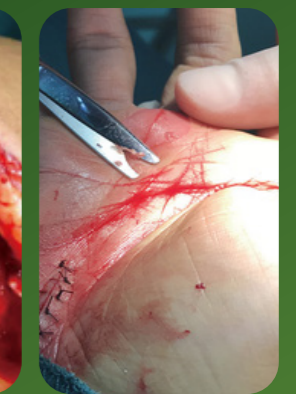
Penetrating wounds



Gunshot wounds



Tear wounds



Deep lacerations  
Severe puncture wounds

# Core Ingredient

Quickclean® is the first hemostatic product in China that utilizes diatom-based ingredients. It is sourced from artificially cultivated marine diatoms and characterized by a unique porous structure, offering the following advantages:

## Rapid Hemostasis

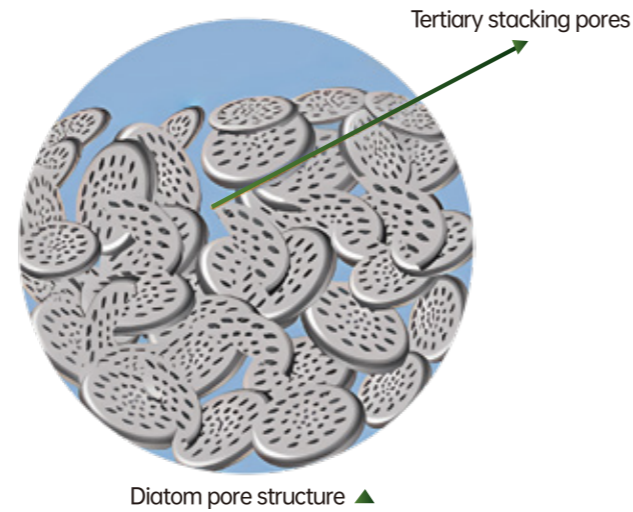
The natural porous structure of diatomaceous earth efficiently adsorbs blood and moisture, accelerating coagulation and shortening hemostatic time.

## High Safety

Granular products can reduce the risk of entering blood vessels.

## Sustainable Sourcing

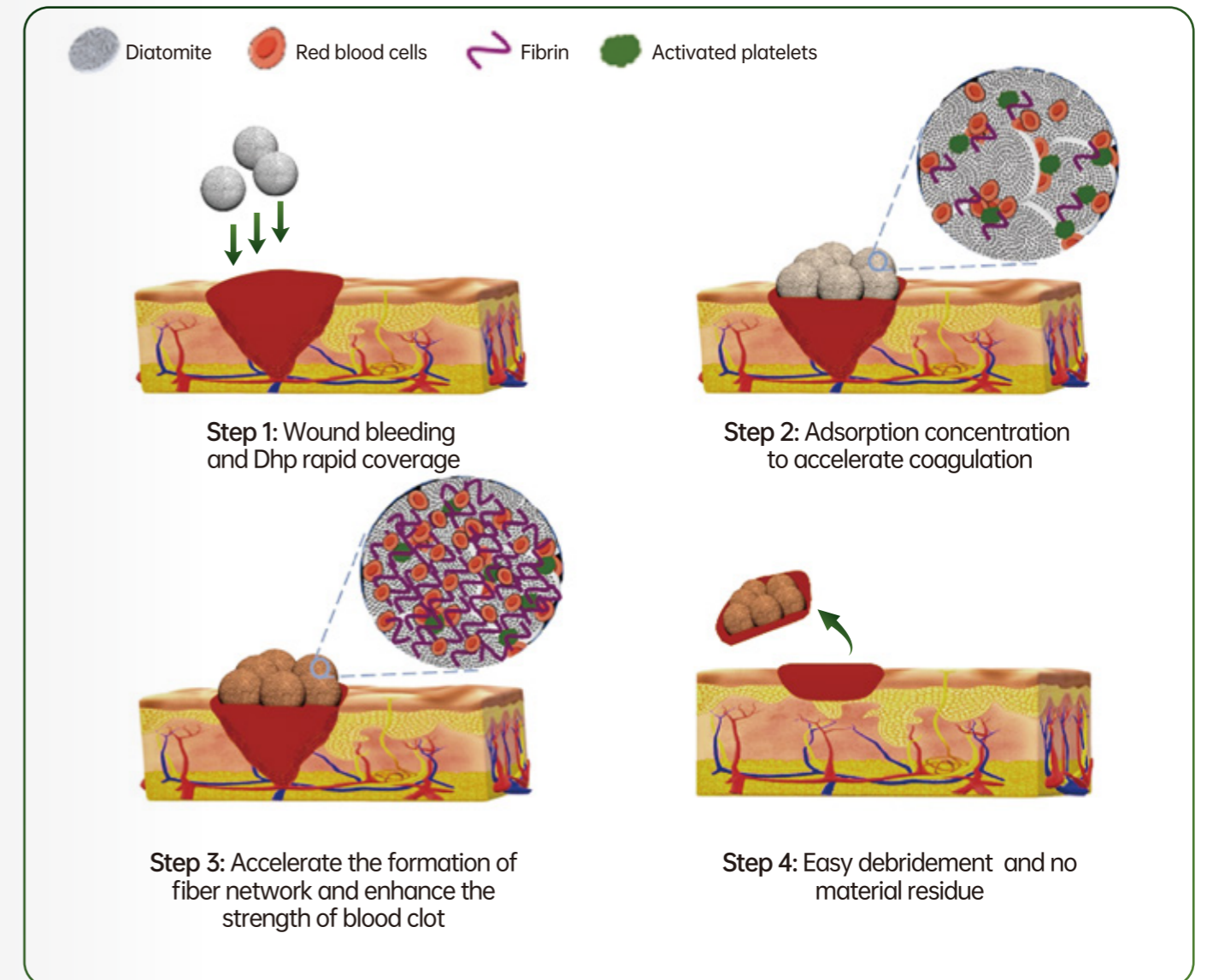
The raw material is derived from artificially cultivated marine diatoms, enabling scalable production with eco-friendly and sustainable practices.



Developed by this product undertakes several research projects. Supported by a solid technological foundation, it is backed by comprehensive scientific research and clinical evidence.

# Hemostatic Mechanism

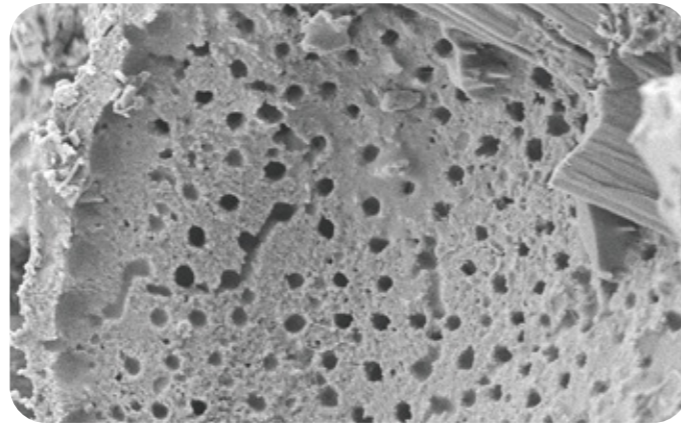
Quickclean® Diatomite Hemostatic Granules can absorb water(plasma) from the blood, causing the blood at the wound site to thicken instantly, and sharply increasing the concentration of platelets and clotting factors, thereby achieving rapid hemostasis.



# Unique Porous Structure in Hemostasis

- Diatomaceous earth particles possess a unique nanoporous structure, with a complex pore system composed of hierarchical channels including micropores, mesopores, and macropores.
- Larger pores can accommodate and adsorb red blood cells, promoting their rapid aggregation.

· Simultaneously, the interconnected multi-level channels accelerate liquid diffusion and penetration, enabling efficient absorption and rapid concentration of water in the blood, thereby significantly enhancing hemostatic efficiency.



## Key Advantages

### Rapid Hemostasis

Multi-level porous structure quickly absorbs plasma, concentrates coagulation components, and accelerates clot formation.

### Safe & Reliable

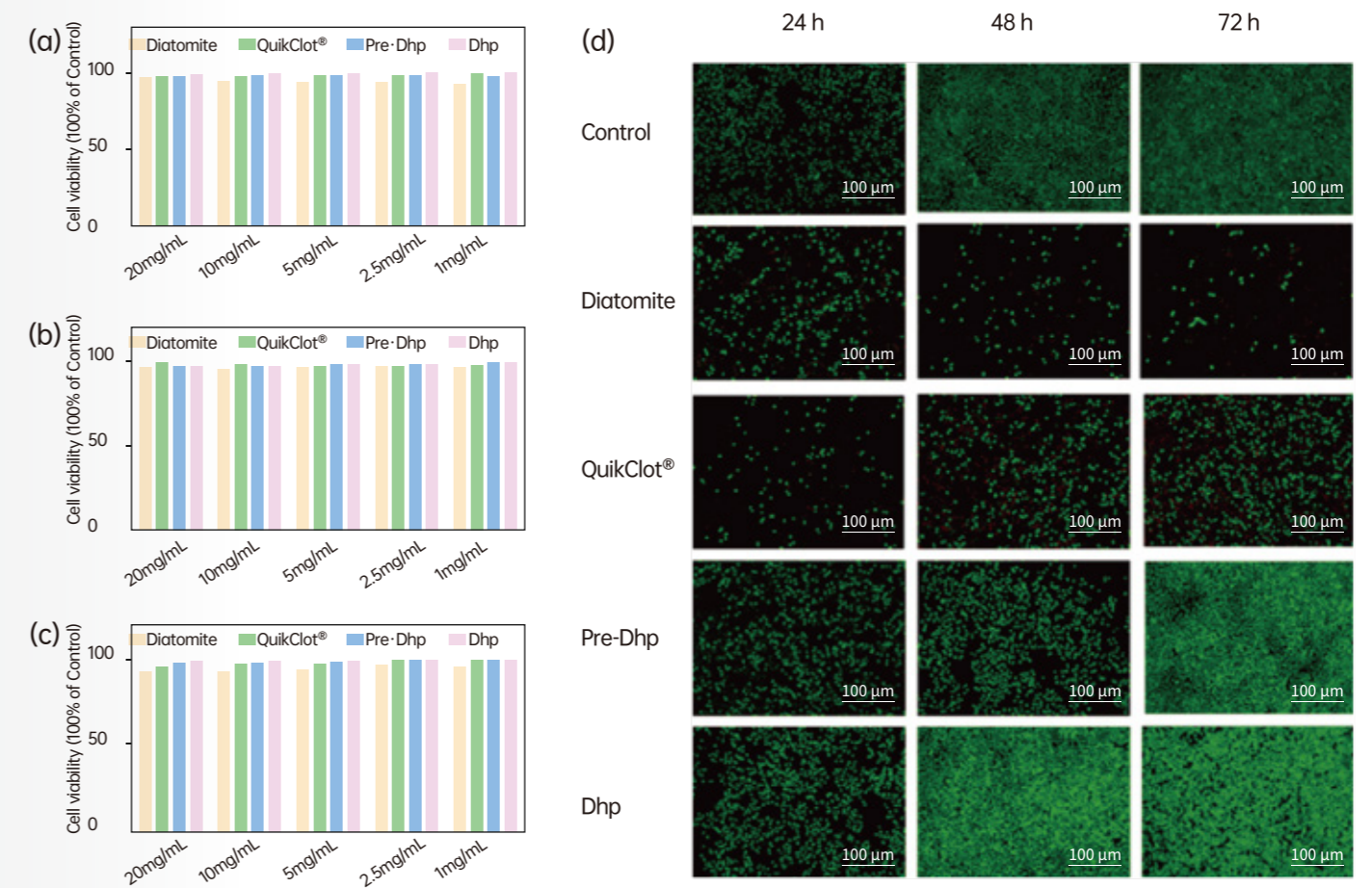
Cytotoxicity tests confirm a cell survival rate of >90%. Completely free of animal-derived components, eliminating risks of xeno-protein allergy and pathogen transmission.

### Easy to Use

Ready-to-use with no pretreatment required. The granular design minimizes the risk of intravascular entry while providing excellent wound coverage. Simple, intuitive application suitable for emergency scenarios.

# Cytotoxicity Assessment and Animal Model Validation

## Biological Evaluation: Cytotoxicity Testing<sup>[1]</sup>



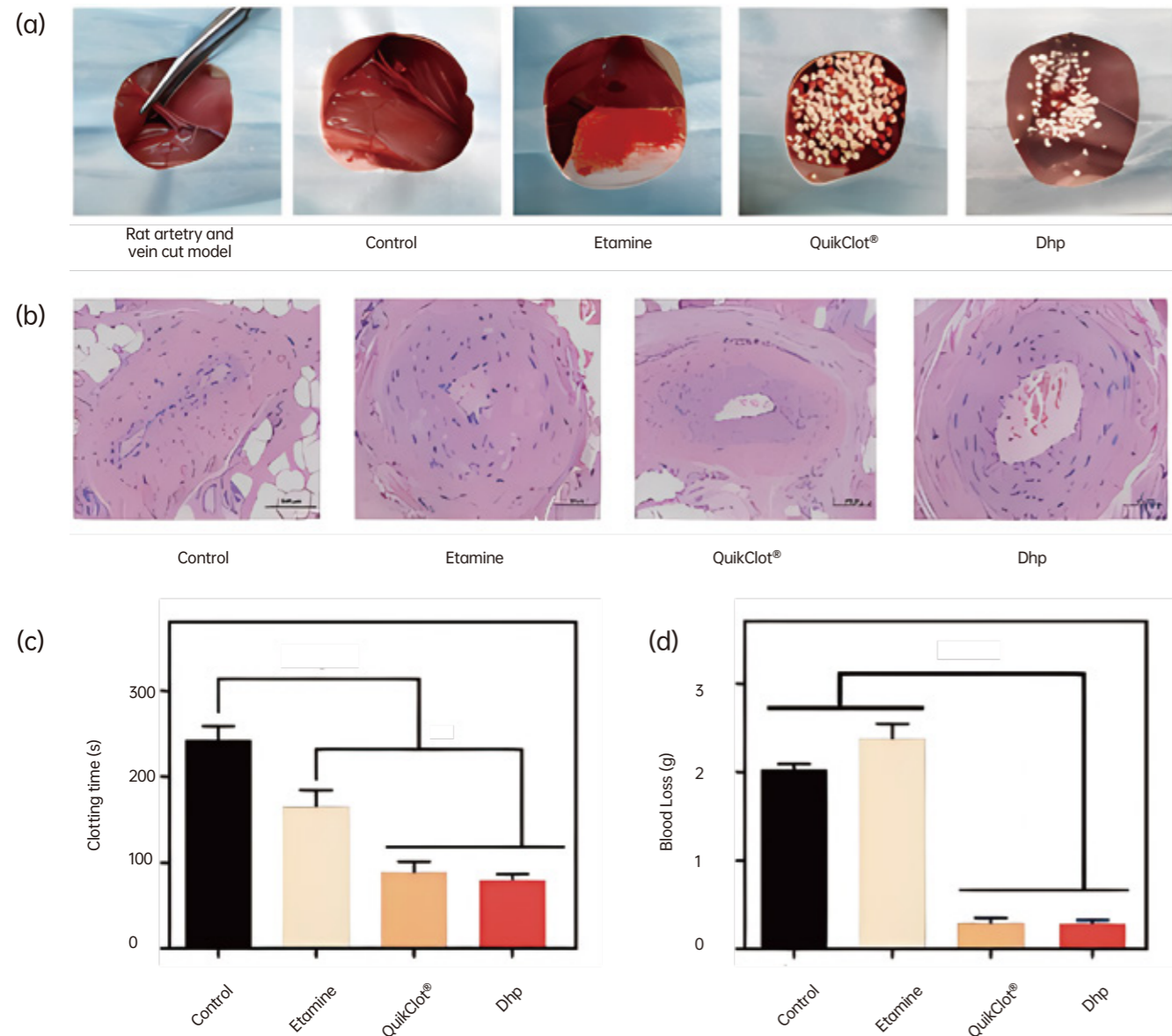
Figures a, b, and c represent the cell survival rates under different concentrations at 24, 48, and 72 hours for the blank control group, raw diatomite material, QuikClot® kaolin, uncalcined diatomite granules, and finished diatomite granules, respectively. Figure d is a fluorescence staining image, where green part indicates live cells.

### Conclusion:

The results show that compared with the blank control group, raw diatomite material, QuikClot® kaolin, and uncalcined diatomite granules, **the finished diatomite granules exhibit a higher cell survival rate, exceeding 90%**, demonstrating greater safety and reliability of the product.

[1] . Chang Su, Changqing Jiang, Xiaojie Sun, Zheng Cao, Yuzhi Mu, Xin Cong, Kaijin Qiu, Jiawen Lin , Xiguang Chen , Chao Feng, Diatomite hemostatic particles with hierarchical porous structure for rapid and effective hemostasis, Colloids and Surfaces B: Biointerfaces, 2022, 219, 112809.

## ✔ Safety and Efficacy Evaluation: A Rat Tail Transection Bleeding Model<sup>[1]</sup>



**Figure a.** Photos of wounds in different treatment groups after hemostasis in the rat femoral artery model.

**Figure b.** Histopathology (H&E staining): Diatomite hemostatic granules show minimal tissue residue and facilitate easier debridement versus blank control, gauze, and kaolin.

**Figure c.** Coagulation time: Diatomite granules achieve faster clot formation than blank control, gauze, and kaolin.

**Figure d.** Hemostatic efficiency: Diatomite granules demonstrate stronger hemostatic capability compared to blank control, gauze, and kaolin.

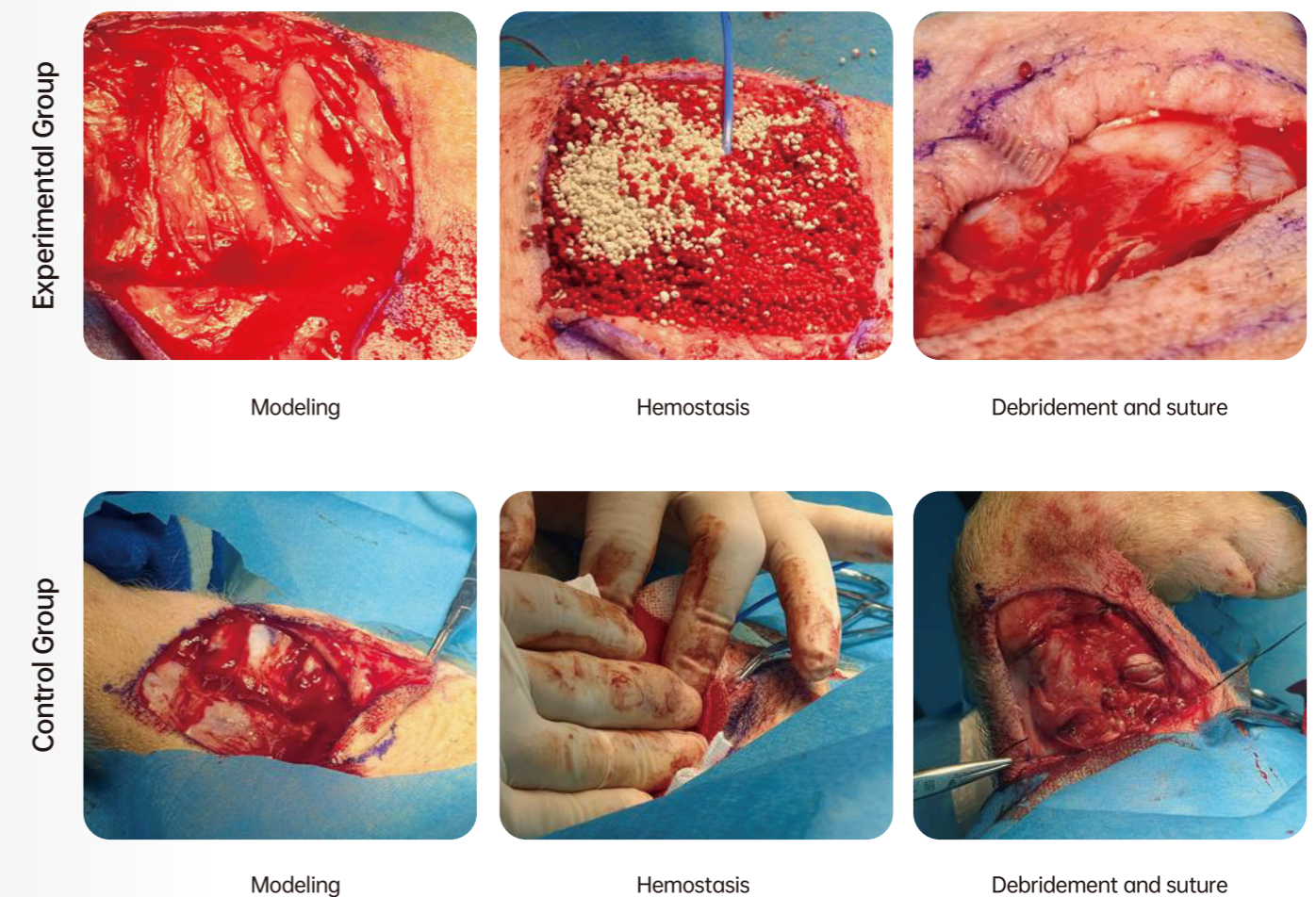
## ✔ Animal Test

The effectiveness and safety of Quickclean® diatomite hemostatic granules were evaluated using a porcine skin wound bleeding model.

A 5 cm × 5 cm square wound area was established, within which three parallel linear incisions were made with a blade at 1 cm intervals. Each incision had a depth of 15 mm and was designed to sever abundant arteries and veins in the area, simulating clinical lacerations. In the experimental group, hemostasis was achieved using Quickclean®, while the control group received conventional gauze treatment.

Experimental group: blood loss **12.63±8.21g**, hemostasis time **115.83±42.43** seconds (within **3** minutes)

Gauze control group: blood loss **41.48±35.93g**, hemostasis time greater than **600** seconds (over **10** minutes)



[1] Chang Su, Changqing Jiang, Xiaojie Sun, Zheng Cao, Yuzhi Mu, Xin Cong, Kaijin Qiu, Jiawen Lin, Xiguang Chen, Chao Feng, Diatomite hemostatic particles with hierarchical porous structure for rapid and effective hemostasis, Colloids and Surfaces B: Biointerfaces, 2022, 219, 112809.

# Material Comparison

Wound Hemostatic Materials			
Materials	Hemostatic mechanism	Drawback	Representative products
Zeolite	Zeolites typically feature pore sizes ranging from approximately 0.4 to 12 nm. Their cage-like cavities selectively absorb water molecules from blood while excluding water content, thereby promoting coagulation by retaining formed elements (coagulation factors and platelets) within the bloodstream.	Direct use of zeolite powder can easily enter blood vessels and lead to the formation of microthrombi. Easy to thermal damage.	QuikClot® granular powder(QC) Advanced Cloting Sponge(ACS) Advanced Cloting Spongeplus(ACS+).
Chitosan	It can selectively absorb water molecules in the blood while expelling water from it, thereby promoting the coagulation of formed elements (coagulation factors and platelets) in the blood.	Biological materials are not suitable for harsh environments.	/
Kaolin	When QCG comes into contact with blood, kaolin immediately dissociates from the gauze and activates the endogenous coagulation cascade reaction. Easy to clean the wound.	Hemostasis is not rapid enough, multiple dressings often need to be applied, and the effect will be weakened when dealing with patients with coagulation disorders, depending on the host's own coagulation function.	QuikClot® Combat Gauze™(QCG), QuikClot® Combat Gauze XL(QCX), QuikClot® Combat Gauze Trauma Pad (QCTP) and QuikClot® Interventional™(QCD).

Selecting diatomite hemostatic granules can have unique advantages:



Suitable for covering various types of wounds.



Compared with powders, granular products are less likely to enter blood vessels, reducing the risk of microthrombosis and avoiding thermal damage.



Granular products are easier to clean during wound debridement.



Easy to use anytime and anywhere, adaptable to extreme scenarios such as high or low temperatures, unlike chitosan-based biological products.



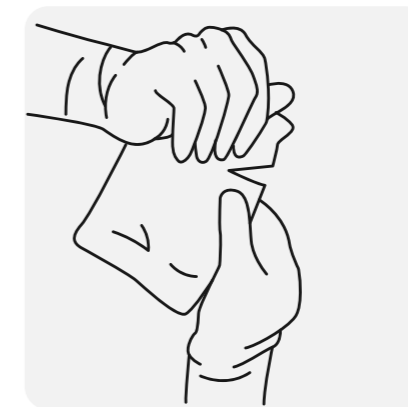
The hierarchical porous structure of diatomite provides a large specific surface area and porosity, enabling rapid absorption of plasma moisture, increasing the concentration of red blood cells and platelets at the wound site, and achieving fast hemostasis.

## Directions For Use



**1**

Clean the wound from blood and foreign bodies.



**2**

Tear open the aluminum foil bag.



**3**

Immediately pour entire contents of pouch into the wound and apply direct pressure. Increase the amount as needed depending on the wound size.

## Warnings

- (1) Dispose of this product as medical waste after use.
- (2) Thoroughly remove this product after use.
- (3) For external hemostasis only; do not ingest.