

EXPANDAG™

TECHNICAL PRODUCT DOCUMENTATION

EXPANSIVE MORTAR

Soundless Cracking Agent (HSCA)

PRODUCT INSTRUCTION & APPLICATION MANUAL

A practical technical guide covering product selection, borehole preparation, mixing, filling, safety, storage, troubleshooting and field application.

120–130

MPA EXPANSION PRESSURE

28–30%

WATER MIXING RATIO

30–42

RECOMMENDED HOLE Ø MM

2012+

EXPORT EXPERIENCE

EXPANDAG™

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Important

This manual provides general application guidance. Actual borehole layout, spacing, depth, temperature management and dosage should be confirmed according to the rock type, site conditions and field test results.

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Manufacturer & Technical Support

Hezhou Topping Rock Drill Equipment Co., Ltd. (Brand: EXPANDAG) is a manufacturer and exporter based in Hezhou, Guangxi, China. The company supplies Expansive Mortar (HSCA), Soundless Cracking Agent and rock drilling machinery and tools to international customers.

EXPANDAG™ products are developed for applications where controlled rock splitting or concrete demolition is required without conventional explosive blasting.

2012+

INTERNATIONAL EXPORT EXPERIENCE

50+

COUNTRIES SERVED

CN

MANUFACTURED IN CHINA

Who We Serve

Quarry Operators

Granite, marble, limestone and other dimension-stone or aggregate quarrying operations.

Demolition Contractors

Controlled concrete breaking and structural demolition where conventional blasting is unsuitable.

Distributors & Importers

Regional distributors seeking technical documentation, samples and factory-direct supply.

GLOBAL SUPPLY NETWORK

Manufactured in Hezhou, Guangxi, China • Supplied to the World



Quality Control



Professional Technology



Global Supply



Technical Documentation Available

Product technical data, SDS/MSDS, batch information and export documentation can be provided according to product and shipment requirements.

What Is Expansive Mortar?

Expansive Mortar, also known as **Soundless Cracking Agent (HSCA)**, is a non-explosive rock and concrete splitting material.

The material is primarily based on calcium oxide (CaO). After mixing with the specified amount of water, a controlled hydration reaction produces substantial expansive pressure inside a confined borehole. The resulting pressure acts against the surrounding rock or concrete and initiates cracking.

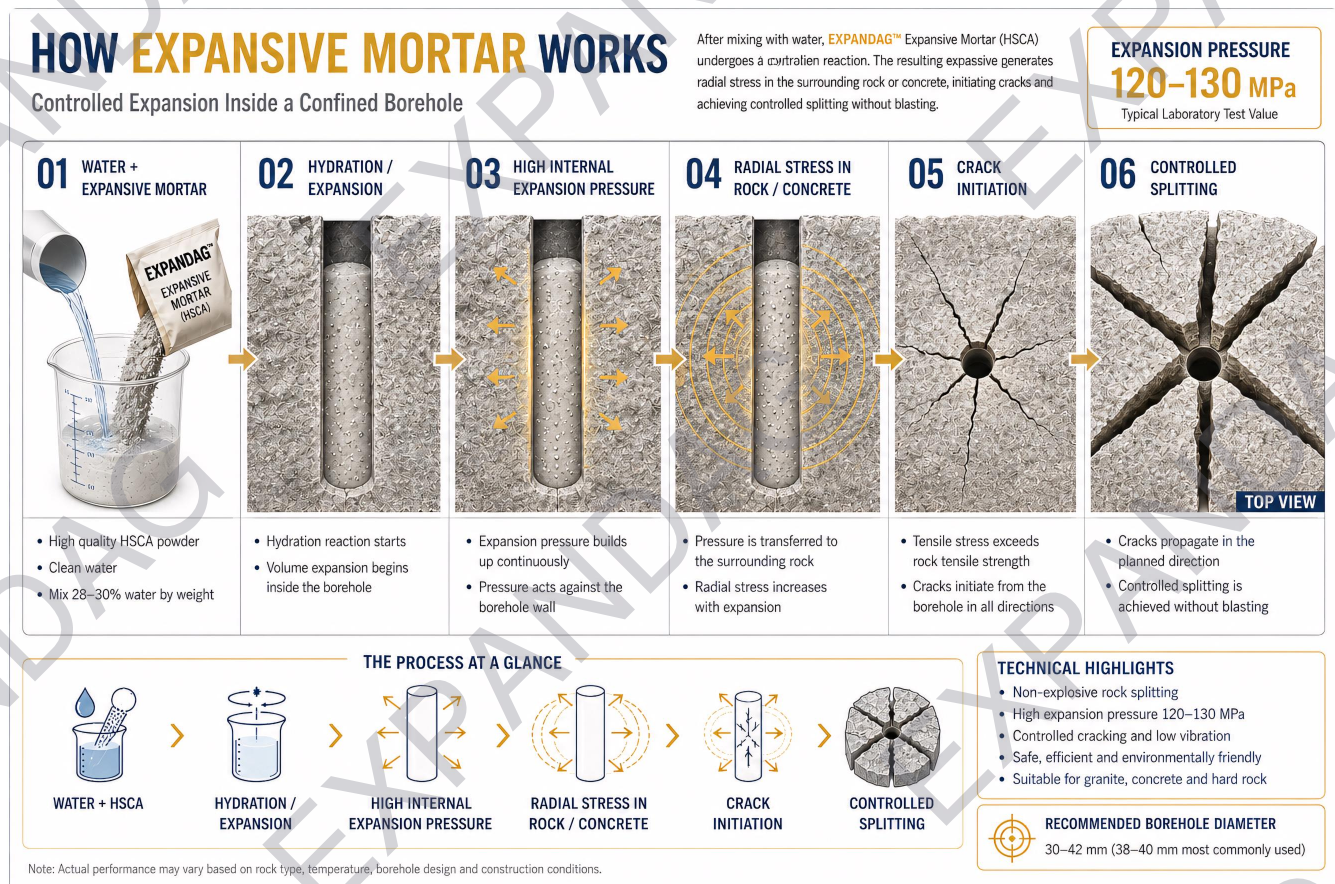
Controlled Expansion

Expansion occurs inside the drilled borehole. The pressure gradually develops and is transferred to the surrounding material.

Non-Explosive Method

Unlike explosive blasting, the process does not rely on detonation to break the material.

How It Works



TECHNICAL NOTE

Performance depends on borehole diameter, depth, spacing, burden, rock properties, temperature, product grade, mixing ratio and material condition. Field testing is recommended before large-scale application.

COMPARED WITH BLASTING

HSCA is designed for non-explosive controlled splitting and generally produces significantly less noise, vibration and flyrock risk than conventional explosive blasting. It is not appropriate to describe every application as completely silent or completely free of all risk.

Product Grades & Technical Data

Temperature Grade Selection

Select the product grade according to the **actual temperature of the material inside the borehole**, not simply the outdoor air temperature.

HSCA-1

Warm Temperature Grade

Recommended borehole temperature range:

25°C–40°C

. Suitable for warm-weather applications when the actual borehole temperature falls within this range.

HSCA-2

Moderate Temperature Grade

Recommended borehole temperature range:

10°C–25°C

. Suitable for moderate ambient and borehole conditions.

HSCA-3

Cold Temperature Grade

Recommended borehole temperature range:

–5°C–10°C

. The typical crack initiation time under suitable conditions is approximately

6–12 hours

.

⚠ Grade selection warning: Using a grade outside its recommended temperature range can result in delayed reaction, premature reaction or inconsistent cracking performance.

Technical Specifications

Parameter	Specification / Recommendation
Expansion Pressure	120–130 MPa
Water Mixing Ratio	28–30% by weight
Recommended Borehole Diameter	30–42 mm
Recommended Working Diameter	38–40 mm commonly used for standard applications
Reference Consumption	1.5–1.7 kg per linear meter for 38–40 mm boreholes
Shelf Life	12 months when properly sealed and stored dry
Storage Humidity	Preferably below 70% RH , protected from moisture
Standard Packaging	20 kg carton with moisture-resistant inner lining
HS Code	3824999999 — confirm current customs requirements for the destination
Production Location	Hezhou, Guangxi, China

Plan the Borehole Pattern

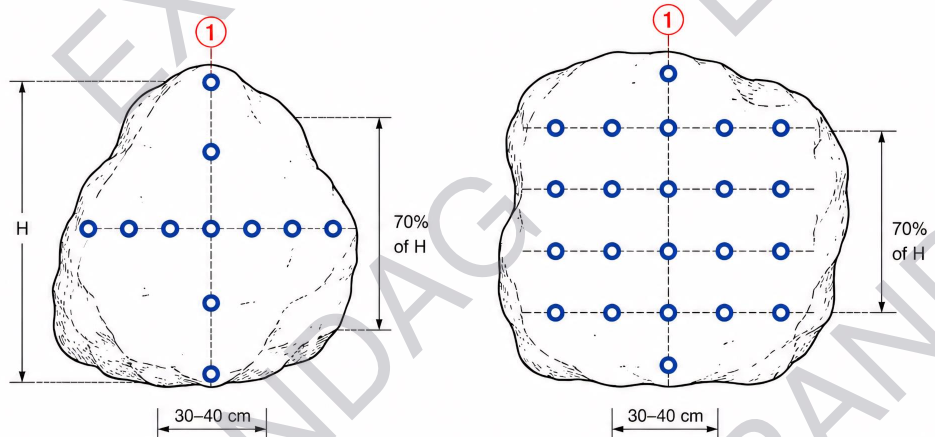
Borehole design is one of the most important factors affecting crack direction, splitting efficiency and material consumption. The drilling pattern should be designed according to the rock structure and the required splitting direction.

BOULDER SPLITTING DRILLING LAYOUT

Optimal drilling pattern for natural boulders

TECHNICAL PARAMETERS	
	HOLE DIAMETER 30–38 mm
	HOLE SPACING 30–40 cm
	HOLE DEPTH 70% of boulder height

○ Drill Hole - - - - - Drilling Line ① Fill All Holes



NOTES

- Drill all holes according to the layout.
- Ensure holes are vertical and evenly spaced.
- Clean all holes before filling HSCA.

WORKFLOW



Key Design Parameters

Parameter	Purpose	Important Consideration
Borehole Diameter	Controls internal expansion geometry and material volume.	Recommended range: 30–42 mm .
Borehole Depth	Determines the effective length of the cracking zone.	Should be determined according to material thickness and project geometry.
Hole Spacing	Controls crack propagation between adjacent holes.	Must be selected according to rock type and field testing.
Burden / Free Face	Influences the direction in which cracks develop.	Smaller burden generally provides easier crack release.
Hole Inclination	Can help control splitting direction in some applications.	Depends on the geometry of the block or structure.

Reference Material Consumption

1.5–1.7 kg/m

PER LINEAR METER · 38–40 MM BOREHOLE

CONSUMPTION FORMULA

Total Material ≈ Borehole Length × Number of Boreholes × 1.5–1.7 kg/m

Reference value for 38–40 mm boreholes. Actual consumption varies with borehole diameter, depth, layout and field conditions.

EXAMPLE

A 10 m borehole length at the reference consumption of 1.5–1.7 kg/m requires approximately 15–17 kg of dry material. Project quantities should be calculated from the final drilling plan.

Preparation & Mixing

01

Drill the Boreholes

- Use the planned borehole diameter, generally 30–42 mm.
- 38–40 mm is a commonly used working diameter.
- Follow the project-specific drilling pattern.
- Ensure the borehole reaches the required depth.
- Remove loose drilling debris before filling.



02

Check Borehole Condition

- Check actual borehole temperature when possible.
- Select HSCA-1, HSCA-2 or HSCA-3 according to temperature.
- Do not fill excessively hot boreholes.
- Keep the hole free from excessive loose material.
- Confirm that the planned crack direction is clear.



03

Open the Packaging

- Open the outer carton only when ready for use.
- Remove the moisture-resistant inner bag.
- Do not use material showing obvious moisture damage or hard lumps.
- Keep unused material sealed and dry.



04

Mix with Clean Water

- Use **28–30% water by weight**.
- Reference: **5 kg powder + approximately 1.5 L water**.
- Another reference: 1 kg powder + 280–300 g water.
- Measure water accurately before mixing.
- Add powder gradually into the measured water while mixing continuously.
- Mix until a smooth, uniform slurry is obtained without visible dry lumps.

⚠ Do not add extra water to make the slurry easier to pour. Excessive water changes the designed water-to-powder ratio and may reduce performance or alter the reaction behavior.



Filling & Crack Development

05

Pour into the Borehole

- Fill as soon as practical after mixing.
- Keep the slurry uniform during the filling process.
- Pour carefully to avoid splashing.
- Do not introduce additional water into the borehole.
- Do not intentionally seal or plug the borehole unless a specific procedure has been provided.



06

Allow the Reaction to Develop

- Establish an exclusion zone after filling.
- Do not look directly into filled boreholes.
- Do not disturb or approach active boreholes unnecessarily.
- Crack initiation time depends on grade, borehole temperature, rock properties and application conditions.
- For HSCA-3, a typical crack initiation range is approximately **6–12 hours** under suitable conditions.

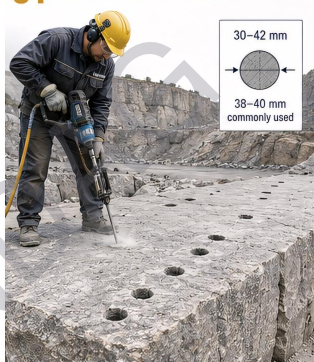


07

Controlled Rock / Concrete Splitting

- Expansion pressure develops inside the boreholes.
- Cracks initiate where the stress exceeds the local material resistance.
- Adjacent cracks may connect along the planned drilling pattern.
- After the material has sufficiently cracked, proceed with mechanical removal or secondary breaking.

01 DRILL THE BOREHOLES



02 CHECK BOREHOLE CONDITION



03 OPEN THE PACKAGING



04 MIX WITH CLEAN WATER



05 FILL THE BOREHOLES



06 ALLOW EXPANSION



07 CONTROLLED SPLITTING



Field recommendation: For a new rock type, new temperature condition or new drilling pattern, perform a small test section before proceeding with full-scale production.

Where Expansive Mortar Is Used

01 Granite & Marble Quarrying

Used for controlled splitting of natural stone where vibration-sensitive environments or controlled crack propagation are important.

- Block separation
- Secondary breaking
- Bench or block preparation
- Controlled splitting along drilling patterns

02 Concrete Demolition

Suitable for selected concrete breaking applications where conventional impact demolition or blasting is undesirable.

- Foundation removal
- Large concrete blocks
- Structural sections
- Restricted-access projects

03 Secondary Rock Breaking

Can be used to reduce oversized rocks or fragmented sections after primary quarrying or excavation operations.

- Oversized rocks
- Large boulders
- Blocked excavation areas
- Controlled secondary breaking

04 Construction Excavation

Useful for selected excavation and foundation projects where controlled rock removal is required.

- Foundation excavation
- Rock trenching
- Restricted urban locations
- Vibration-sensitive areas

01 GRANITE & MARBLE QUARRYING

Block Separation



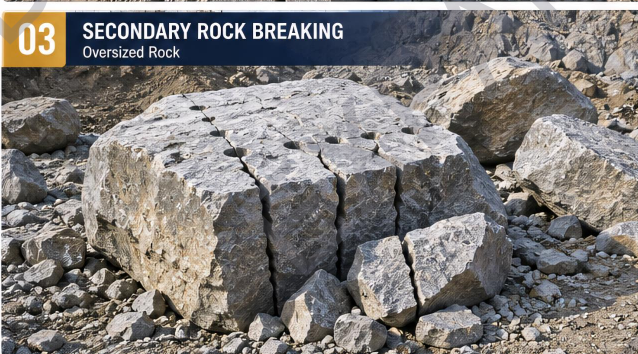
02 CONCRETE DEMOLITION

Foundation Removal



03 SECONDARY ROCK BREAKING

Oversized Rock



04 CONSTRUCTION EXCAVATION

Rock Excavation



NOTE: Application suitability should be assessed according to site conditions, rock type, borehole design and project requirements.

Application suitability should be assessed according to local site conditions, rock/concrete properties, access requirements and applicable safety regulations.

Storage & Material Condition

Moisture is the primary storage risk for Expansive Mortar. The product should remain sealed and protected from humidity until use.

Shelf Life

12

MONTHS SHELF LIFE

<70%

PREFERRED RH

DRY

PRIMARY STORAGE
REQUIREMENT

Handling Older Stock

Product beyond the recommended shelf life should not automatically be assumed to have the same performance as fresh material. If older stock must be evaluated, inspect packaging condition and conduct a controlled field test before production use.

Recommended field check: Test a small number of boreholes first and compare crack initiation and splitting performance with expected results.



RECOMMENDED STORAGE

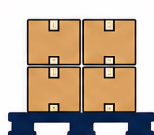
1



DRY WAREHOUSE

Keep cartons in a dry, covered warehouse.

2



STORE ON PALLET

Store on pallets and keep off the floor.

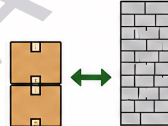
3



PROTECT FROM RAIN

Protect from rain and condensation.

4



AWAY FROM HUMID WALLS

Avoid storing near humid exterior walls.

5



KEEP SEALED

Keep packaging sealed until required.

6



FIFO ROTATION

Use FIFO stock rotation.



AVOID

1



DIRECT CONTACT WITH WATER

Do not allow direct contact with water.

2



OPEN STORAGE OUTDOORS

Do not store cartons outdoors or in the open.

3



HIGH-HUMIDITY ENVIRONMENTS

Avoid storage in high-humidity environments.

4



DAMAGED OR UNSEALED INNER BAGS

Do not use damaged or unsealed inner bags.

5



LONG EXPOSURE TO MOISTURE

Avoid long exposure to moisture or condensation.

6



USING VISIBLY MOISTURE-DAMAGED MATERIAL

Do not use material that is visibly damp, caked or hardened.



IMPORTANT NOTE

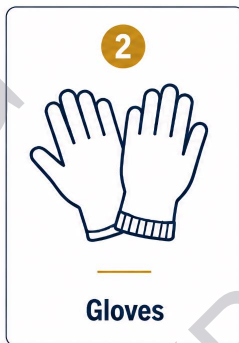
EXPANDAG™ Expansive Mortar is sensitive to moisture. Improper storage may affect performance. Store correctly to maintain product quality and ensure reliable expansion performance.

Safety Guidelines

⚠ IMPORTANT SAFETY NOTICE

Expansive Mortar develops high internal expansion pressure. Improper grade selection, excessive water, unsuitable borehole temperature or unsafe access to active boreholes may create hazards. Follow the product instructions and applicable site safety procedures.

Personal Protective Equipment



Critical Operating Rules

✓ DO

Select the correct grade according to actual borehole temperature.

✗ DON'T

Do not use an unsuitable temperature grade.

✓ DO

Measure the specified water quantity accurately.

✗ DON'T

Do not add extra water to improve flowability.

✓ DO

Keep personnel away from active filled boreholes.

✗ DON'T

Never look directly into an active filled borehole.

✓ DO

Allow excessively hot boreholes to cool before filling.

✗ DON'T

Do not fill boreholes that are excessively hot.

Hot-Weather Precautions

In hot climates, especially in desert or summer conditions, borehole temperature can be substantially higher than the surrounding air temperature. Avoid filling during the hottest part of the day when borehole temperature exceeds the selected grade range.

Blowout Prevention

Improper application can cause material to eject from the borehole. Establish an exclusion zone after filling, prevent personnel from looking into or standing directly over active boreholes, and follow the manufacturer's detailed blowout-prevention procedure where applicable.

Field Troubleshooting Guide

When cracking performance is slower or weaker than expected, check the basic variables in the following order:

temperature → product grade → water ratio → borehole condition → drilling pattern → material condition.

Problem	Possible Cause	Recommended Check / Action
No crack	Wrong temperature grade; unsuitable borehole conditions; excessive burden; incorrect layout.	Check actual borehole temperature, grade selection, borehole pattern and free-face conditions.
Cracking is too slow	Low temperature; unsuitable grade; excessive burden; incorrect water ratio.	Verify temperature and grade first, then confirm the 28-30% water ratio and drilling pattern.
Slurry is too fluid	Too much water.	Recheck weighing and measuring procedure. Do not add additional water beyond the specified ratio.
Premature reaction	Borehole temperature too high; unsuitable warm conditions; incorrect grade.	Check borehole temperature and use the correct grade. Avoid filling excessively hot holes.
Uneven cracking	Irregular borehole spacing, varying depth, geological joints or inconsistent filling.	Review drilling accuracy, hole condition, filling procedure and natural rock structure.
Weak performance	Moisture-damaged product; incorrect mixing; unsuitable application conditions.	Inspect packaging and powder condition. Confirm water ratio and perform a controlled test with fresh material.

Field testing principle: If the application conditions are new, test a small section before changing multiple variables at the same time. This makes it easier to identify the actual cause of poor performance.

Recommended Troubleshooting Sequence

01 CHECK TEMPERATURE	02 CHECK PRODUCT GRADE	03 CHECK WATER RATIO
04 CHECK BOREHOLES	05 CHECK LAYOUT	06 CHECK MATERIAL CONDITION

Quality Control & Technical Support

Consistent field performance starts with controlled manufacturing, proper packaging and correct storage. EXPANDAG™ supports customers with product documentation and technical information for international projects.

Batch Control

Production and shipment records can be maintained by batch to support traceability and customer quality management.

Retained Samples

Retained production samples can support internal quality checks and investigation where required.

Technical Documents

SDS/MSDS and relevant product documentation can be supplied according to product and destination requirements.

Factory Support

Customers may request product samples, technical discussion and factory-related information before placing larger orders.

Recommended Customer Verification

Before Order

Confirm product grade, packaging, quantity and destination requirements.

Before Application

Confirm borehole temperature, drilling pattern, product condition and water ratio.

During Application

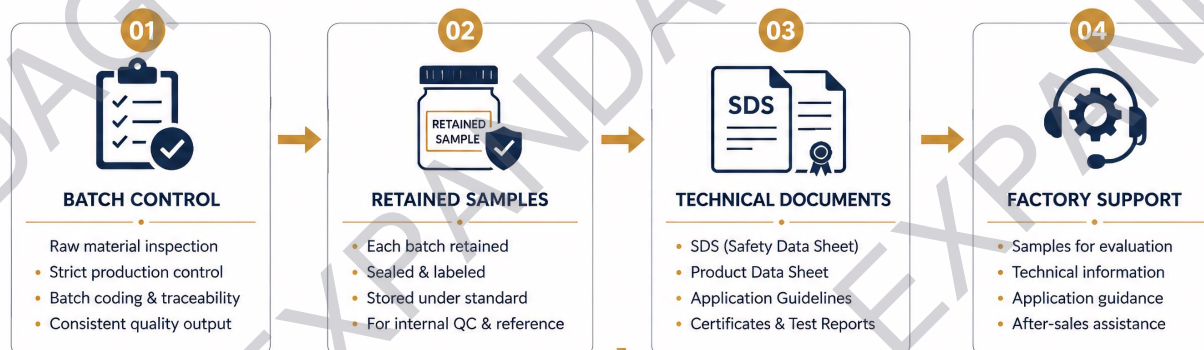
Record mixing ratio, application time, weather conditions and crack initiation.

Why Field Testing Matters

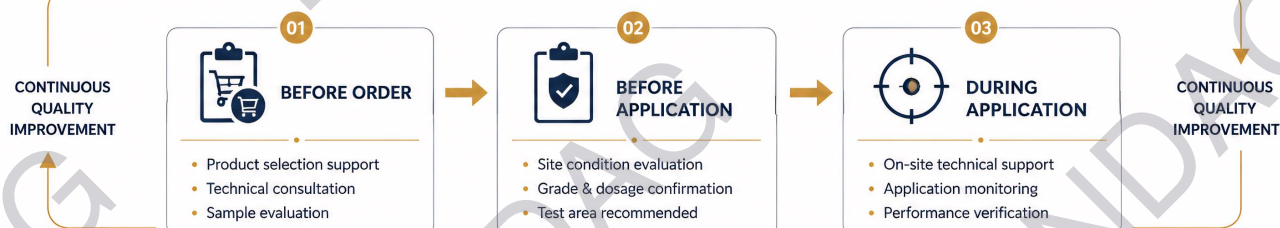
Granite, marble, limestone, concrete and other materials can respond differently to expansive pressure. A small controlled test provides valuable information about grade selection, drilling pattern and expected reaction time before full production.

EXPANDAG™ QUALITY ASSURANCE PROCESS

FACTORY QUALITY ASSURANCE



CUSTOMER VERIFICATION & FIELD APPLICATION



FULL TRACEABILITY · STRICT QUALITY CONTROL · RELIABLE PERFORMANCE

EXPANDAG™ is committed to delivering consistent high-quality products and professional technical support worldwide.

Packaging & International Shipment

Standard Packaging

20 kg

STANDARD CARTON

Moisture Protection

Inner packaging is designed to provide additional protection against moisture during normal storage and transportation.



Shipping Information

Item	Reference Information
Container	Standard dry general-cargo container may be used where permitted by the applicable shipment classification and carrier requirements.
HS Code	3824999999
Trade Terms	EXW / FOB / CIF and other agreed Incoterms
Commonly Requested Term	CIF
Typical Documents	SDS/MSDS, Commercial Invoice, Packing List, Bill of Lading and Certificate of Origin where required.

⚠ Shipping classification: Transport and dangerous-goods status must be determined from the current SDS and applicable carrier, port and destination-country rules. Do not rely solely on a generic product description when booking shipment.

Export Documentation Support

SDS / MSDS

Product safety and handling documentation.

Commercial Documents

Invoice and packing list according to order requirements.

Shipping Documents

Bill of Lading and other export documents as applicable.

Frequently Asked Questions

01. What is Expansive Mortar?

It is a non-explosive cracking material used to split rock and concrete through controlled expansion pressure.

02. What is HSCA?

HSCA stands for Soundless Cracking Agent. It is another commonly used name for expansive demolition mortar.

03. How does HSCA break rock?

After hydration, the material develops expansive pressure inside confined boreholes and generates cracking stress.

04. What borehole diameter should be used?

The recommended range is 30–42 mm. A 38–40 mm diameter is commonly used for standard applications.

05. What is the water ratio?

Use approximately 28–30% water by weight. For example, 5 kg powder requires approximately 1.5 L water.

06. How do I select the grade?

Select HSCA-1, HSCA-2 or HSCA-3 according to the actual borehole temperature.

07. What are the temperature ranges?

HSCA-1: 25–40°C; HSCA-2: 10–25°C; HSCA-3: –5–10°C.

08. How much material is required?

For 38–40 mm boreholes, the reference consumption is approximately 1.5–1.7 kg per linear meter.

09. How long does it take to crack?

Reaction time depends on grade and site conditions. HSCA-3 typically initiates cracking in approximately 6–12 hours under suitable conditions.

10. Can it be used on granite?

Yes. Granite quarrying is one of the important application areas, subject to suitable drilling and field conditions.

11. How should it be stored?

Keep sealed, dry and protected from humidity. The recommended shelf life is 12 months under proper storage.

12. Can I order a sample?

Sample arrangements can be discussed with EXPANDAG according to the destination and application requirements.

Need Application Advice?

Provide the material type, approximate block or structure size, borehole diameter, local temperature and required splitting direction. These details help our technical team evaluate the application.



Contact EXPANDAG™

For product inquiries, samples, technical consultation, project evaluation and export orders, please contact the manufacturer directly.



Hezhou Topping Rock Drill Equipment Co., Ltd.

MANUFACTURER · EXPORT-READY HSCA · SINCE 2012

✉ BRAND

EXPANDAG™

🛡 PRODUCT

Expansive Mortar / Soundless Cracking Agent / HSCA

🌐 WEBSITE

www.expandag.com

📍 FACTORY

Hezhou, Guangxi, China

✉ EMAIL

info@expandag.com

📞 WHATSAPP

0086 18978406522

👤 WECHAT

0086 18978406522

✓ DIRECT FROM MANUFACTURER · NO MIDDLEMEN · FAST QUOTATION



For Technical Inquiry

Please provide rock or concrete type, application, temperature, borehole diameter and project requirements.

For Export Inquiry

Please provide destination country, required quantity, preferred trade term and delivery port.

EXPANDAG™

CONTROLLED ROCK SPLITTING · ENGINEERED FOR EXPORT

SOUNDLESS CRACKING AGENT

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