



# CRACKSTONE

SILENT POWER, STRONGER RESULTS



NAADNIA  
GROUP

## DEMOLITION POWDER



## CATALOG



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Crackstone® Is A Professional-Grade, Non-Explosive Chemical Demolition Agent Engineered For The Controlled, Silent Breaking Of Rock And Concrete. It Is A Powder That, When Mixed With Water And Poured Into Pre-Drilled Holes, Undergoes A Chemical Reaction That Causes It To Expand With Immense Force. This Expansive Pressure, Reaching Over 18,000 PSI, Fractures The Material From Within In A Predictable And Safe Manner.

The Primary Advantage Of Crackstone® Is Its Ability To Perform Demolition Without The Hazardous And Disruptive Side Effects Of Traditional Methods Like Explosives Or Hydraulic Hammers. It Operates Silently And Produces No Ground Vibration, Fly-Rock, Dust, Or Toxic Fumes. This Makes It An Ideal Solution For Projects In Sensitive Or Restricted Environments, Such As Urban Areas, Hospitals, And Active Industrial Sites. As A Non-Explosive, It Fundamentally Enhances Worksite Safety And Eliminates The Need For Blasting Permits And Specialized Personnel.

# 1: The Crackstone Advantage: Redefining Controlled Demolition

## 1.1. Introduction: A New Standard In Non-Explosive Demolition

Crackstone® Represents The Next Generation Of Non-Explosive, Soundless Chemical Demolition Agents (Scdas). Engineered For Professionals In The Civil Engineering, Mining, And Large-Scale Construction Sectors, It Provides An Unparalleled Level Of Precision, Predictability, And Performance. While The Fundamental Principles Of Silent, Controlled Cracking Are Established, Crackstone® Elevates The Technology Through Rigorous Quality Control, Lot-To-Lot Chemical Consistency, And Engineered Expansive Pressure Curves Designed For The Most Demanding Industrial Applications. In An Era Of Increasing Urban Density, Stringent Environmental Regulations, And Complex Project Constraints, Crackstone® Is Not Merely An Alternative To Conventional Methods; It Is An Enabling Technology For Critical Projects Where Performance Is Non-Negotiable And Failure Is Not An Option. This Document Serves As A Definitive Technical And Commercial Prospectus, Detailing The Superior Capabilities That Position Crackstone® As The Professional's Choice For Controlled Demolition.

## 1.2. Core Benefits For The Modern Industrial Project

The Application Of Crackstone® Translates Directly Into Enhanced Project Efficiency, Significant Risk Mitigation, And Superior Outcomes. Its Benefits Are Engineered To Address The Primary Challenges Of Modern Demolition And Excavation Projects.

- **Absolute Control And Environmental Integrity:** Crackstone® Performs Its Function Without Any Of The Disruptive Byproducts Of Conventional Demolition. It Completely Eliminates Noise, Ground Vibration, Fly-Rock, Dust, And Toxic Gases. This Makes It The Ideal Solution For Work In Sensitive Environments, Including Urban Centers, Hospitals, Active Industrial Facilities, And Ecologically Protected Areas Where Traditional Methods Are Prohibited Or Technically Infeasible.
- **Unmatched Safety And Simplified Logistics:** As A Non-Explosive Agent, Crackstone® Fundamentally Enhances Worksite Safety. Its Use Obviates The Need For Special Permits, Explosive Licensing, And Highly Trained Blasting Personnel, Thereby Streamlining Project Logistics And Reducing Administrative Overhead. Storage And Handling Protocols Are Straightforward, Comparable To Those For Standard Cementitious Products, Further Simplifying Site Management And Reducing The Project's Overall Risk Profile.
- **Predictable And Precise Performance:** The Crackstone® System Is Engineered For Consistent And Predictable Fracturing. By Carefully Controlling The Chemical Hydration Process, It Allows For The Precise Planning Of Fracture Lines, Enabling Controlled Demolition Of Complex Structures And High-Yield Quarrying Of Dimensional Stone. This Level Of Control Minimizes Waste And Ensures That Surrounding Structures Remain Completely Unharmed.
- **Enhanced Operational Efficiency:** The Use Of Crackstone® Significantly Reduces Reliance On Heavy And Noisy Mechanical Breakers, Which Can Cause Structural Fatigue In Adjacent Areas. It Allows Demolition And Construction Activities To Proceed Concurrently And In Close Proximity Without Disruption, Leading To Compressed Project Timelines. Work Can Be Conducted 24/7, Even In Noise-Restricted Zones, Maximizing Productivity And Asset Utilization.

### 1.3. Crackstone® Vs. Conventional Demolition Methods

To Provide A Clear Framework For Project Planning And Methodology Selection, The Following Table Compares Crackstone® Against Traditional Demolition Techniques. The Data Illustrates Not Only The Operational Advantages But Also The Significant Reduction In Risk And External Costs Associated With Permitting, Safety Protocols, And Environmental Monitoring. For Procurement Managers And Senior Engineers, This Analysis Provides A Data-Driven Justification For Specifying Crackstone® In Controlled Demolition Scenarios. The Selection Of A Demolition Method Is A Critical Decision That Impacts A Project's Budget, Timeline, And Risk Profile. While Explosives And Mechanical Breakers Have Their Place, They Introduce Significant Externalities That Are Often Unacceptable In Modern Construction Environments. Crackstone® Was Engineered To Eliminate These Variables, Offering A Solution That Is Superior In Terms Of Control, Safety, And Environmental Impact.

Feature	Explosives (E.G., Dynamite)	Mechanical Breakers (E.G., Hydraulic Hammer)	Crackstone® SCDA
Noise Generation	Extreme (>140 Db)	Very High (>120 Db)	Negligible (<50 Db)
Ground Vibration	Very High (Risk To Structures)	High (Localized Risk)	None
Fly-Rock / Debris	High (Extensive Safety Zone Required)	Moderate (Localized Hazard)	None
Dust / Gas Emissions	High (Toxic Fumes)	High (Silica Dust)	Negligible
Required Permits/Licenses	Extensive & Complex	None	None
Personnel Skill Requirement	Certified Blasting Experts	Skilled Heavy Equipment Operator	General Construction Labor
Operational Constraints	Prohibited In Urban/Sensitive Areas	Noise & Time Restrictions	Minimal; Suitable For 24/7 Operation
Precision & Control	Low	Moderate	Very High
Overall Safety Profile	High Risk	Moderate Risk	Low Risk
Insurance Risk Profile	Very High	Moderate	Low

Table 1: Comparative Analysis Of Demolition Methodologies. Data Synthesized From Industry Standards And Source Material.

## 2: Product Grades And Applications

### 2.1. The Crackstone® Temperature-Calibrated System

The Performance And Safety Of Any Soundless Chemical Demolition Agent Are Critically Dependent On The Temperature Of The Substrate (Rock Or Concrete) Into Which It Is Poured. Temperature Directly Governs The Rate Of The Chemical Hydration Reaction That Generates Expansive Pressure. Using A Formulation That Reacts Too Quickly In A Hot Environment Can Lead To A Dangerous Blowout—A Violent Ejection Of Steam And Hot Material From The Drill Hole. Conversely, A Formulation That Reacts Too Slowly In A Cold Environment Will Result In Poor Performance And Project Delays.

While The Industry Standard Is To Offer Temperature-Specific Grades, The Crackstone® System Is Engineered To Eliminate Ambiguity And User Error. Competitor Product Lines Often Feature Numerous Grades With Narrow Or Overlapping Temperature Bands, Creating Complexity In Inventory And Increasing The Risk Of Incorrect Selection On-Site. Crackstone® Simplifies This Critical Decision With Four Distinct, Scientifically Calibrated, And Color-Coded Product Grades. Each Grade Is Formulated For A Specific, Non-Overlapping Temperature Window, Ensuring Optimal Performance And Safety. This System Is Not Merely A Product Range; It Is An Engineered Solution Designed For Foolproof Application In Real-World Field Conditions.

## **2.2. Crackstone® Product Grade Specifications**

To Ensure Predictable Results, Measure The Substrate Temperature Using A Probe Or Infrared Thermometer Before Selecting The Appropriate Crackstone® Grade.

### **● Crackstone C-45 (Hot Climate Grade)**

- **Operational Temperature Range:** 35°C To 50°C (95°F - 122°F)

- **Description:** Formulated With Advanced Chemical Retardants That Precisely Control The Hydration Reaction In High-Heat Conditions. This Prevents Premature, Overly Aggressive Expansion, Ensuring A Powerful But Controlled Fracture Process And Mitigating The Risk Of Blowouts. Ideal For Projects In Tropical Or Desert Climates And For Applications Where Solar Gain Has Significantly Heated The Substrate.

### **● Crackstone C-30 (Temperate Climate Grade)**

- **Operational Temperature Range:** 20°C To 35°C (68°F - 95°F)

- **Description:** The Versatile Workhorse Of The Product Line, The C-30 Grade Is Optimized For The Most Common Global Temperature Conditions. It Provides A Perfect Balance Of Rapid Pressure Generation And Ample Working Time, Making It The Standard Choice For A Wide Array Of Demolition And Quarrying Applications.

### **● Crackstone C-15 (Cool Condition Grade)**

- **Operational Temperature Range:** 5°C To 20°C (41°F - 68°F)

- **Description:** This Formulation Includes Chemical Accelerators That Ensure A Robust And Efficient Hydration Reaction Even As Ambient And Substrate Temperatures Fall. It Maintains An Effective

Pressure Generation Curve In Cooler Environments Where Standard Agents Would Perform Sluggishly, Ensuring Project Timelines Are Met During Spring, Autumn, Or In Higher-Altitude Locations.

● **Crackstone C-0 (Sub-Zero Application Grade)**

○ **Operational Temperature Range:** -5°C To 5°C (23°F - 41°F)

○ **Description:** A Highly Specialized Formulation Engineered With Anti-Freeze Agents And Potent Accelerators That Enable The Hydration Process To Occur Effectively In Near- And Sub-Freezing Conditions. This Grade Allows Critical Demolition And Excavation Work To Continue Through Winter Months, Preventing Costly Seasonal Shutdowns.

2.3. Application Matrix

This Matrix Provides At-A-Glance Guidance For Selecting The Appropriate Crackstone® Grade For Various Common Applications.

Application / Material	Crackstone C-45	Crackstone C-30	Crackstone C-15	Crackstone C-0
High-Strength Granite Quarrying	✓	✓	✓	✓
Marble & Dimensional Stone Quarrying	✓	✓	✓	✓
Mass Concrete Demolition (>1m Thick)	✓	✓	✓	✓
Reinforced Concrete Breaking	✓	✓	✓	✓
Trenching & Mass Rock Excavation	✓	✓	✓	✓
Boulder Splitting & Secondary Breaking	✓	✓	✓	✓

Table 2: Application Suitability Matrix. Suitability Is Determined By Substrate Temperature.

# 3: Performance: Technical Data And Analysis

## 3.1. Technical Datasheet

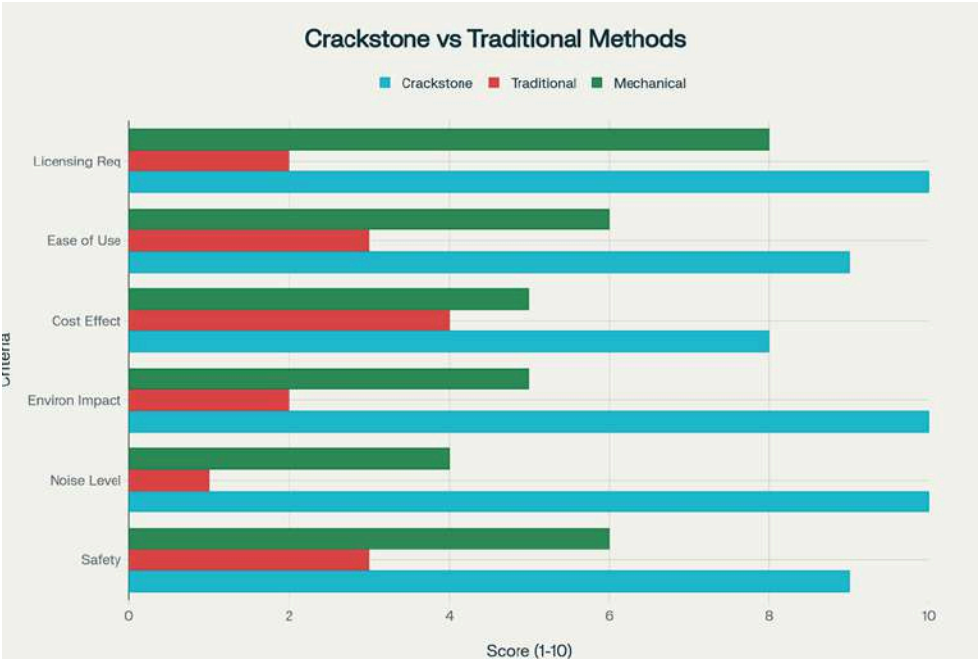
The Crackstone® Technical Datasheet (TDS) Is Designed To Provide Engineers, Architects, And Project Managers With The Comprehensive Data Required For Specification, Planning, And Execution. Unlike Abbreviated Datasheets Common In The Industry, This TDS Offers Complete Transparency Into The Product's Chemical, Physical, And Performance Characteristics, Reflecting Our Commitment To Providing A Fully Characterized Engineering Material. The Following Data Is For Our Most Widely Used Grade; Datasheets For All Other Grades Are Available Upon Request.

Parameter	Specification
<b>Product Information</b>	
Product Name	Crackstone® C-30
Product Grade	Temperate Climate Grade
Description	A Non-Explosive, Expansive Cementitious Powder For Controlled Demolition Of Rock And Concrete.
Primary Use	Substrate Temperatures From 20°C To 35°C (68°F - 95°F).
<b>Chemical Composition (Typical Analysis)</b>	
Calcium Oxide (Cao)	85 - 95%
Silicon Dioxide (Sio <sub>2</sub> )	2 - 6%
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	0.5 - 3%
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> )	0.5 - 2%
Magnesium Oxide (Mgo)	< 1.5%
Sulfur Trioxide (SO <sub>3</sub> )	< 3.0%
<b>Physical Properties</b>	
Form	Fine Grey Powder
Odor	None
Bulk Density	1100 - 1200
Ph (In Slurry)	Approx. 13
Shelf Life	24 Months In Original, Unopened, Vacuum-Sealed Packaging.
<b>Performance Characteristics (At 25°C Substrate Temp)</b>	



Peak Expansive Pressure	> 130 Mpa (18,850 PSI)
Time To Peak Pressure	12 - 16 Hours
Time To Initial Crack (Unreinforced Concrete)	4 - 8 Hours
Recommended Water Ratio	1.5 Liters Per 5 Kg Bag (30% By Weight)
Slurry Working Time (Pot Life)	5 - 10 Minutes After Mixing
<b>Application Parameters</b>	
Recommended Hole Diameter	32 Mm - 40 Mm
Minimum Hole Depth	5 Times The Hole Diameter
Recommended Hole Spacing	See Section 6.1

Table 3: Crackstone® C-30 Grade Technical Data Sheet (TDS). Data Based On Internal R&D And Synthesis Of Academic And Industry Sources.

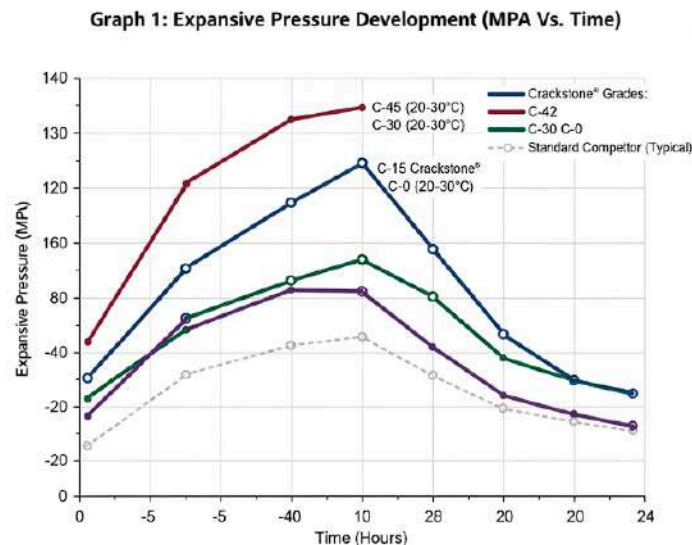


3.2. Performance Analysis: Expansive Pressure Generation

Numerical Claims Alone Do Not Capture The Full Performance Profile Of An Advanced Demolition Agent. The Dynamics Of Pressure Generation Over Time Are Critical For Project Planning And Achieving Desired Results. Crackstone® Provides This Data To Empower Engineers With A Deeper Understanding Of The Product's Behavior.

● Graph 1: Expansive Pressure Development (Mpa Vs. Time)

This Graph Would Visually Display The Expansive Pressure Curves For All Four Crackstone® Grades Over A 24-Hour Period, Each Tested Within Its Optimal Temperature Range. The Vertical Axis Represents Expansive Pressure In Megapascals (Mpa), And The Horizontal Axis Represents Time In Hours. Each Grade (C-45, C-30, C-15, C-0) Would Have Its Own Distinct Curve, Demonstrating A Rapid Initial Rise Followed By A Leveling Off As It Approaches Its Peak Pressure Of Over 130 Mpa. For Comparison, A Dotted Line Labeled "Standard Competitor" Would Be Plotted, Showing A Typical Curve That Peaks At A Significantly Lower Pressure, Around 60-80 Mpa, As Indicated By Competitor Data. This Visual Comparison Immediately Establishes Crackstone's Superior Power Output, Which Translates To Faster Cracking And The Ability To Break Harder Materials.

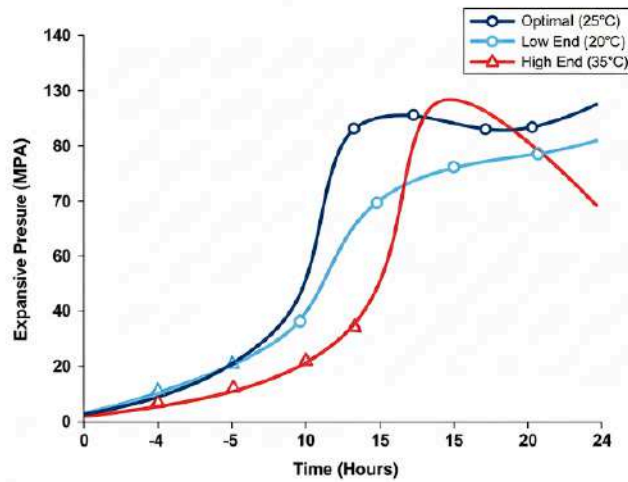


This graph illustrates the pressure generates for Crackstone® grades within their optimal air temperature ranges, compared to a typical competitor product, superior expansive power and rate.

● Graph 2: Influence Of Temperature On C-30 Grade Performance

This Graph Would Illustrate The Sensitivity And Proper Application Of The C-30 Grade. It Would Show Three Distinct Pressure-Over-Time Curves For The Same C-30 Product. The First Curve, Labeled "Optimal (25°C)," Would Show The Ideal Performance. The Second Curve, "Low End (20°C)," Would Show A Slightly Slower Rate Of Pressure Gain. The Third Curve, "High End (35°C)," Would Show A More Rapid Initial Reaction. This Graph Serves A Critical Educational Purpose: It Demonstrates Why The Temperature Ranges Are Specified And Reinforces That While The Product Is Robust, Optimal Performance Is Achieved By Operating Within The Designated Temperature Window. It Showcases The Depth Of Our Product Characterization And Builds User Trust Through Transparency.

Graph 2: Influence of Temperature on C-30 Grade Performance

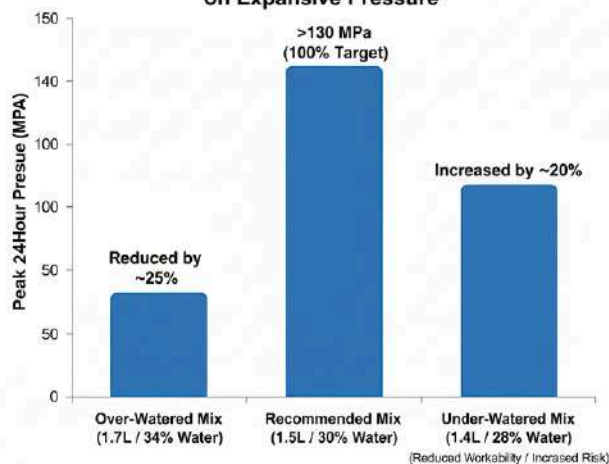


This graph illustrates how the performance of Crackstone® C-30 is affected by ambient temperature, demonstrating why optimal temperature ranges are critical for achieving maximum expansive pressure.

### ● Graph 3: Influence Of Water Content On Expansive Pressure

This Bar Chart Would Powerfully Illustrate The Critical Importance Of Precise Mixing, A Factor Often Underestimated By Users. Based On Established Academic Findings, It Would Show Three Bars Representing The Peak 24-Hour Pressure. The Center Bar, "Recommended Mix (1.5L / 30% Water)," Would Show The 100% Target Pressure (>130 Mpa). The Bar To Its Left, "Over-Watered Mix (1.7L / 34% Water)," Would Show A Pressure Reduction Of Approximately 25%. The Bar To Its Right, "Under-Watered Mix (1.4L / 28% Water)," Would Show A Pressure Increase Of Nearly 20%, But With A Note About Reduced Workability And Increased Risk If Not Handled Correctly. This Chart Is A Powerful Tool For Training And Troubleshooting, Converting An Abstract Instruction ("Mix Correctly") Into A Quantifiable Performance Outcome. It Demonstrates A Commitment To User Education And Product Mastery That Is Unparalleled In The Industry.

Graph 3: Influence of Water Content on Expansive Pressure



This bar chart demonstrates the critical impact of precise water content on Crackstone® performance, highlighting the optimal mix for maximum pressure and emphasizing the risks of incorrect mixing ratios.



# 4: Commitment To Safety, Quality, And Environmental Stewardship

## 4.1. A Culture Of Safety

At Crackstone®, Our Commitment To Safety Is Absolute And Non-Negotiable. It Is Engineered Into Our Product's Chemistry, Embedded In Our Manufacturing Processes, And Delivered To Our Customers Through Clear, Comprehensive Documentation And Support. We View Our Safety Protocols And Data Not As A Mere Legal Obligation, But As A Core Component Of The Crackstone® Product Offering. Our Goal Is To Empower Every User With The Knowledge To Handle Our Product Safely And Effectively, Ensuring The Protection Of Personnel, Property, And The Environment On Every Project.

## 4.2. Superior Safety Data Sheet (SDS) Summary

The Full, 16-Section Safety Data Sheet For Each Crackstone® Product Is Available For Download At Our Website. The Following Summary Highlights The Most Critical Information For On-Site Personnel.

### ● Key Hazards (GHS Classification):

- **Danger:** Causes Serious Eye Damage (H318). Contact With Eyes Can Cause Chemical Burns And Potentially Irreversible Tissue Destruction.
- **Warning:** Causes Skin Irritation (H315). Prolonged Contact With Moist Skin Can Lead To Irritation Or Chemical Burns.
- **Warning:** May Cause Respiratory Irritation (H335). Inhalation Of Dust Can Irritate The Mucous Membranes Of The Nose, Throat, And Respiratory System.

- **Mandatory Personal Protective Equipment (PPE):**

- **Eye/Face Protection:** Full-Seal Safety Goggles Or A Face Shield Compliant With EN166 Are Mandatory At All Times During Mixing, Handling, And Pouring.

- **Hand Protection:** Chemical-Resistant, Waterproof Gloves (E.G., Nitrile Or Rubber) Compliant With EN374/EN388 Are Required To Prevent Skin Contact.

- **Respiratory Protection:** In Poorly Ventilated Areas Or During Mixing, A P3/EN149 Rated Dust Mask Is Required To Prevent Inhalation Of Powder.

- **First Aid Measures:**

- **Eye Contact:** Immediately Flush Eyes With Plenty Of Clean, Running Water For At Least 20 Minutes, Holding Eyelids Open. Remove Contact Lenses If Present And Easy To Do. Seek Immediate Medical Attention.

- **Skin Contact:** Remove Contaminated Clothing. Wash Affected Area Thoroughly With Soap And Water. Seek Medical Advice If Irritation Develops Or Persists.

- **Inhalation:** Move The Person To Fresh Air. If Breathing Is Difficult, Provide Oxygen. Seek Medical Attention If Symptoms Persist.

- **Ingestion:** Do NOT Induce Vomiting. If The Person Is Conscious, Have Them Rinse Their Mouth And Drink A Small Quantity Of Water. Seek Immediate Medical Attention.

- **Blowout Prevention Protocol:**

A "Blowout" Is A Rare But Hazardous Event Where A Rapid, Uncontrolled Reaction Causes The Violent Ejection Of Hot Slurry And Steam From The Drill Hole. It Is Almost Always Caused By User Error. Adherence To The Following Protocol Is Mandatory To Prevent This Occurrence:

1. **Verify Temperature:** Always Measure The Substrate Temperature And Use The Correct Crackstone® Grade For That Range.

2. **Use Cool Water:** Never Use Hot Water For Mixing. Water Temperature Should Not Exceed 20°C (68°F).

3. **Respect Hole Diameter:** Never Drill Holes Larger Than 40 Mm In Diameter. Larger Holes Can Lead To An Unsafe Reaction Rate.

4. **Maintain Safe Distance:** Never Look Directly Into Filled Holes. Cordon Off The Area And Maintain A Safe Distance For At Least 8 Hours After Pouring.

## 5: Proven In The Field: Quantified Case Studies

The Following Case Studies Demonstrate The Real-World Application And Quantifiable Benefits Of The Crackstone® System Across A Range Of Challenging Industrial Projects.

#### 5.1. Case Study 1: Urban Reinforced Concrete Demolition

- **Project:** Removal Of A 50 Reinforced Concrete Machine Foundation Inside An Active Pharmaceutical Manufacturing Plant.
- **Problem:** The Client Needed To Remove The Foundation To Install New Equipment. The Use Of Hydraulic Hammers Was Strictly Prohibited Due To The Extreme Sensitivity Of Adjacent Production Lines To Ground Vibration. Dust Contamination Was Also A Critical Concern That Could Lead To Costly Production Shutdowns.
- **Solution:** The Project Team Selected Crackstone® C-30. A Grid Pattern Of 38 Mm Diameter Holes Was Drilled To 90% Of The Foundation's Depth, With A Spacing Of 30 Cm. To Minimize Disruption To Plant Operations, The Mixing And Pouring Were Conducted By A Small Crew Overnight.
- **Results:** The Foundation Was Systematically Fractured And Ready For Quiet Removal By An Electric Excavator Within 12 Hours Of Pouring. On-Site Seismographs Recorded Zero Detectable Ground Vibration, Allowing The Adjacent Production Lines To Operate Without Interruption. The Project Was Completed 3 Days Ahead Of The Original Schedule Projected For Mechanical Breaking, Delivering An Estimated **20% Total Project Cost Saving** Due To The Avoidance Of Production Downtime.

#### 5.2. Case Study 2: High-Yield Granite Quarrying

- **Project:** A Dimensional Stone Quarry Specializing In Premium Black Granite.
- **Problem:** The Quarry Was Experiencing A High Percentage Of Waste, Averaging 25%, Due To The Formation Of Micro-Fractures In The Primary Blocks Caused By Even The Most Carefully Controlled Low-Impact Explosive Charges. This Loss Of High-Value Material Was Significantly Impacting Profitability.
- **Solution:** The Quarry Implemented A Pre-Splitting Program Using Crackstone® C-15 To Isolate A 500-Ton Block Of Granite From The Main Quarry Face. A Single Line Of 40 Mm Holes Was Drilled At 40 Cm Spacing Along The Desired Fracture Plane.
- **Results:** Crackstone® Produced A Clean, Precise Fracture Directly Along The Drill Line. Subsequent Analysis Of The Isolated Block Showed No Evidence Of Micro-Fractures. This Method Increased The **Marketable Primary Block Yield By 18%** On The First Extraction. Furthermore, It Eliminated All Costs And Administrative Delays Associated With Blasting Permits, Mandatory Evacuation Protocols, And Environmental Monitoring.

# 6: Comprehensive User Guide

This Guide Provides A Step-By-Step Methodology For The Safe And Effective Use Of Crackstone®. Adherence To These Instructions Is Essential For Achieving Optimal Results.

## 6.1. Step 1: Planning & Hole Design

Proper Hole Design Is The Most Critical Factor For Success. The Goal Is To Create A Pattern That Allows The Expansive Pressure To Work In The Most Efficient Way Possible. Cracking Always Occurs In The Direction Of Least Resistance, Typically Between Adjacent Holes Or Towards A Free Face.

- **Diagrams And Patterns:** This Section Would Include Clear Diagrams Illustrating Standard Hole Patterns For Different Objectives:
  - **Splitting A Boulder:** A Single Line Of Holes Along The Desired Break Line.
  - **Cutting A Trench:** Two Parallel Lines Of Holes.
  - **Mass Demolition:** A Staggered Grid Pattern For Breaking Material Into Smaller Pieces.
- **Hole Spacing:** Hole Spacing Depends On The Material's Tensile Strength And The Hole Diameter. Tighter Spacing Results In Smaller Fragments And Faster Cracking.

Material Type	Hole Diameter: 32 Mm	Hole Diameter: 36 Mm	Hole Diameter: 40 Mm
Hard Rock (E.G., Granite)	25 - 40 Cm	30 - 50 Cm	40 - 60 Cm
Medium Rock (E.G., Sandstone)	30 - 50 Cm	40 - 60 Cm	50 - 70 Cm
Unreinforced Concrete	30 - 60 Cm	40 - 70 Cm	50 - 80 Cm
Reinforced Concrete	20 - 30 Cm	25 - 35 Cm	30 - 40 Cm

Table 4: Recommended Hole Spacing (Cm). Data Synthesized From Industry Best Practices.

## 6.2. Step 2: Drilling

- **Hole Diameter:** Use A Standard Rock Drill To Create Holes With A Diameter Between 32 Mm And 40 Mm. Do Not Exceed 40 Mm.
- **Hole Depth:** For Maximum Effectiveness, Hole Depth Should Be 85-90% Of The Total Thickness Of The Material Being Broken. Never Drill Completely Through The Substrate, As The Slurry Will Run Out. The Minimum Hole Depth Must Be At Least 5 Times Its Diameter To Prevent Blowouts.
- **Cleaning:** This Step Is Critical. All Holes Must Be Thoroughly Cleaned Of Drilling Dust And Water Using High-Pressure Compressed Air. Any Residue Left In The Hole Will Absorb Water From The Slurry, Weakening The Reaction And Potentially Causing Failure.

## 6.3. Step 3: Mixing

Precision In Mixing Is Essential For Generating Maximum Expansive Pressure.

- **Water Ratio:** Use Exactly 1.5 Liters Of Clean, Cool Water For Every 5 Kg Bag Of Crackstone® Powder. Do Not Estimate.
- **Mixing Equipment:** Use A Clean Plastic Bucket And A Mechanical Paddle Mixer Attached To A Low-Speed Drill. Do Not Mix By Hand, As This Can Leave Lumps.
- **Procedure:** Pour The Measured Water Into The Bucket First, Then Gradually Add The Crackstone® Powder While Mixing. Continue To Mix For 2-3 Minutes Until A Smooth, Lump-Free, Pourable Slurry (Similar To A Thick Gravy) Is Obtained.

## 6.4. Step 4: Pouring

The Crackstone® Slurry Has A Limited Working Time (Pot Life) Before It Begins To Set.

- **Timing:** Pour The Mixed Slurry Into The Prepared Holes Within 5-10 Minutes Of Completing The Mixing Process. Do Not Mix More Material Than Can Be Poured Within This Timeframe.
- **Filling:** Pour The Slurry Directly Into The Holes. Do Not Overfill; Leave Approximately 1-2 Cm Of Space At The Top Of Each Hole. No Tamping Or Capping Of The Holes Is Required.

## 6.5. Step 5: Post-Application & Safety



- **Cordon Off Area:** Once All Holes Are Filled, Immediately Cordon Off The Work Area To Prevent Unauthorized Access.

- **Critical Safety Warning: NEVER** Look Directly Into The Filled Holes After Pouring. A Blowout, Though Rare, Can Occur And Is Extremely Dangerous.

- **Cracking Time:** The Time To Initial Cracking Will Vary From 2 To 24 Hours Depending On The Crackstone® Grade, Substrate Temperature, And Material Type. Monitor The Site From A Safe Distance. Once Cracking Is Complete, The Fractured Material Can Be Safely Removed With Standard Excavation Equipment.

# 7: Frequently Asked Questions (FAQ)

This Section Addresses The Most Common Questions From Our Customers, Providing Clear And Concise Answers To Help You Plan And Execute Your Project With Confidence.

## Technical Performance

### 1. How Does Crackstone's Expansive Pressure Compare To Competitors?

Crackstone® Is Engineered To Produce A Peak Expansive Pressure Of Over 130 Mpa (18,850 PSI), Which Is Among The Highest In The Industry And Significantly Greater Than Many Standard Agents That Operate In The 60-80 Mpa Range. This Higher Pressure Translates To Faster Cracking And The Ability To Break Harder, More Resilient Materials.

### 2. What Happens If I Use The Wrong Temperature Grade?

Using The Wrong Grade Is The Primary Cause Of Poor Performance Or Safety Incidents. Using A Cold-Weather Grade In Hot Conditions Can Cause A Dangerous Blowout. Using A Hot-Weather Grade In Cold Conditions Will Result In A Very Slow Or Incomplete Reaction. Always Measure The Substrate Temperature.

### 3. Can Crackstone® Break The Steel Rebar In Reinforced Concrete?

No. Crackstone® Is Designed To Break Brittle Materials Like Concrete And Rock. It Will Crack The Concrete And Expose The Rebar, Which Can Then Be Easily Cut With Mechanical Shears Or Torches. The Cracking Action Significantly Weakens The Bond Between The Concrete And Steel, Making Removal Much Easier.

### 4. How Does Water Content Affect Performance?

Critically. Using Too Much Water Can Reduce The Final Expansive Pressure By 25% Or More. Using Too Little Water, While It Can Increase Pressure, Makes The Slurry Difficult To Pour And Increases Reaction Speed, Elevating Risk. For Predictable Results, The 1.5L Per 5 Kg Ratio Must Be Followed Precisely.

### 5. What Is The Expected Cracking Time?

This Depends On The Grade, Temperature, And Material. For The C-30 Grade In 25°C Concrete, Initial Cracks Typically Appear In 4-8 Hours. Colder Grades And Temperatures Will Take Longer (Up To 24 Hours Or More), While Hotter Grades Will Be Faster (2-4 Hours).

## Safety & Handling

### 6. What Exactly Is A 'Blowout' And How Do I Prevent It?

A Blowout Is A Violent Ejection Of Hot Slurry And Steam From The Hole, Caused By An Excessively Fast Chemical Reaction. It Is Prevented By Strictly Following Our 4-Step Blowout Prevention Protocol: 1) Use The Correct Temperature Grade, 2) Use Only Cool Water, 3) Never Exceed A 40mm Hole Diameter, And 4) Never Look Into Filled Holes.

### 7. Is The Dust From Crackstone® Hazardous?

Yes. Like Portland Cement, The Dust Is Highly Alkaline. It Can Cause Severe Eye Damage And Respiratory Irritation. A P3-Rated Dust Mask And Full-Seal Safety Goggles Are Mandatory During Handling And Mixing.

### 8. What Is The Shelf Life Of Crackstone®?

When Stored In Its Original, Unopened, Vacuum-Sealed Plastic Bag In A Dry Location, Crackstone® Has A Shelf Life Of 24 Months. Once A Bag Is Opened, It Should Be Used As Soon As Possible.

### 9. How Should I Dispose Of Unused Mixed Slurry?

Dilute Any Unused Mixed Slurry With A Large Amount Of Water And Pour It Onto An Open Area Of Ground Where It Can Harden. Do Not Pour Into Drains Or Waterways. Cured Crackstone® Is Inert And Can Be Disposed Of As Standard Construction Waste.

### 10. Is Crackstone® Flammable Or Explosive?

No. Crackstone® Is Completely Non-Flammable And Non-Explosive Under All Conditions Of Use And Storage.

## Application & Troubleshooting

### 11. Why Didn't My Concrete/Rock Crack?

The Most Common Reasons For Failure Are: 1) Incorrect Hole Pattern (Spacing Too Wide Or No Free Face For The Material To Move To), 2) Contaminated Holes (Dust Or Water Left After Drilling Absorbed Moisture From The Mix), 3) Improper Mixing (Too Much Water), Or 4) Using The Wrong Temperature Grade.

### 12. Can I Use Crackstone® In Horizontal Or Upward-Angled Holes?

Yes. For Horizontal Or Overhead Applications, The Slurry Should Be Mixed To A Slightly Thicker, Putty-Like Consistency (Using Slightly Less Water, Approx. 1.4L Per 5kg Bag) And Then Packed Firmly Into The Holes Using A Rod.

### 13. Can I Use It In Water-Filled Holes?

No. Holes Must Be Dewatered And Dry Before Filling. For Underwater Applications, A Tremie Pipe Must Be Used To Place The Slurry At The Bottom Of The Hole, Displacing The Water Upwards Without Mixing.

**14. What Is The Best Way To Clean The Drill Holes?**

High-Pressure Compressed Air Is The Only Recommended Method. It Is Fast, Effective, And Ensures The Holes Are Completely Dry And Free Of Dust.

**15. Can I Add Anything To The Mix, Like An Accelerator?**

No. Never Add Any Other Chemicals, Cement, Or Aggregates To The Crackstone® Mix. The Product Is Precisely Formulated, And Any Additives Will Interfere With The Chemical Reaction, Leading To Failure Or Unpredictable Behavior.

**16. Does Hole Diameter Matter?**

Yes. While Peak Pressure Is Consistent Across The Recommended Range, A Larger Diameter Hole (E.G., 40mm) Holds More Product, Generates Force More Quickly, And Creates Wider Cracks Than A Smaller Hole (E.G., 32mm).

## **Logistics & Ordering**

**17. What Is The Standard Packaging?**

Crackstone® Is Packaged In 5 Kg Vacuum-Sealed, Moisture-Proof Plastic Bags. These Are Packed Four To A Box, For A Total Of 20 Kg Per Box.

**18. What Is The Minimum Order Quantity (MOQ)?**

The Minimum Order Quantity Is One 20 Kg Box. For Larger Projects, We Ship In Pallet Quantities Of 50 Boxes (1000 Kg).

**19. Do You Ship Internationally?**

Yes, We Have A Global Logistics Network And Can Ship To Most Major Ports Worldwide. Crackstone® Is Not Classified As A Dangerous Good, Simplifying International Transport.

**20. How Do I Become A Distributor?**

Please Contact Our Global Sales Department Through The Contact Information Provided On The Back Cover Of This Catalogue. We Are Actively Seeking Partners In Unrepresented Territories.

**21. Can I Get A Sample To Test?**

For Large-Scale Industrial Clients Considering Standardization, Pilot Project Samples Can Be Arranged Through Our Technical Sales Representatives.

# **8: Technical Support**

## **8.1. Packaging And Logistics**

Crackstone® Is Packaged To Ensure Maximum Performance And Shelf Life, Even In Demanding Field Conditions. Our Logistics Are Designed To Support Large-Scale Industrial Projects Globally.

- **Primary Packaging:** Each 5 Kg Unit Of Crackstone® Powder Is Sealed In A Heavy-Duty, Multi-Layer Plastic Bag. The Bag Is Vacuum-Sealed To Remove Air And Moisture, Preventing Premature Hydration And Guaranteeing A 24-Month Shelf Life.
- **Secondary Packaging:** Four (4) Of The 5 Kg Bags Are Packed Into A Reinforced, Weather-Resistant Cardboard Box, For A Total Net Weight Of 20 Kg. Each Box Is Clearly Labeled With The Product Grade, Manufacturing Date, And Batch Number For Full Traceability.
- **Tertiary Packaging (Shipping):** Boxes Are Stacked And Shrink-Wrapped Onto Standard International Pallets. A Standard Pallet Holds 50 Boxes (1000 Kg Net Weight). Pallets Are Protected For International Sea Or Air Freight.
- **Storage Requirements:** To Ensure Product Integrity, Store In A Dry, Covered Location At Temperatures Between 5°C And 35°C. Keep Packaging Sealed Until Immediately Prior To Use.

## 8.2. Transparent Pricing Structure

We Believe In Transparent, Predictable Pricing To Facilitate Accurate Project Budgeting And Procurement. Our Volume-Based Pricing Structure Rewards Larger Commitments And Provides Clear Cost Parameters For Your Planning Needs. Unlike Competitors Who Often Require A Direct Quote For Any Quantity, Our Published Tiers Respect Our Customers' Time And Planning Processes, contact us for pricing and quotation.