

THE CRACKER[®]

Non-Explosive Demolition Agent



Product Description

THE CRACKER[®] is a non-toxic, non-explosive cracking agent used in a myriad of applications including concrete breakage and demolition. It enables standard demolitions to be carried out with consistent accuracy without the need for special equipment, making it safe and simple. Compared to conventional methods of demolition, THE CRACKER[®] is free from vibration, virtually noiseless and is ecologically friendly.

General Uses & Applications

- Demolition agent for use indoors and outdoors in either dry or humid environments
- Use where inaccessible for typical demolition, where blasting is not permitted or where heavy equipment, noise or vibration is unacceptable

Advantages & Features

- Non-explosive demolition of concrete
- Sealed in vacuum packed heavy duty plastic bags
- Develops an extremely high expansion pressure that breaks reinforced concrete or hard stone and can reach over 8,500 psi (59 MPa) within 24 hours

Availability: Adhesives Technology Corp. (ATC) products are available online and through select distributors providing all your construction needs. Please contact ATC for a distributor near you or visit www.atcepoxy.com for online purchasing options or to search for a distributor by zip code.

Color: Concrete Gray

Storage & Shelf Life: 36 months when stored in unopened containers in dry conditions. Store between 40 °F (4 °C) and 95 °F (35 °C).

Installation: Manufacturer's Printed Installation Instructions (MPII) are available within this Technical Data Sheet (TDS). Due to occasional updates and revisions, always verify that you are using the most current version of the MPII. In order to achieve maximum results, proper use is imperative.

Clean-Up: Always wear appropriate protective equipment such as safety glasses and gloves.

Limitations & Warnings:

- Do not mix with solvents, sand, gravel or other foreign substances
- It is critical to measure the exact temperature and amount of water to be added
- Temperature of concrete or rock to be broken is critical in determining the temperature of water to be added (see Table 2)
- Selection of proper hole size is critical for safe and effective use
- Not recommended for slabs less than 6 in. (152 mm)
- Not recommended for cold joint applications

Safety: Please refer to the Safety Data Sheet (SDS) for THE CRACKER[®] published on our website or call ATC for more information at 1-800-892-1880.

Ordering Information

TABLE 1: The CRACKER PACKAGING

Packaging	11 lb. bag (5 kg)
Part #	CRKR
Units Per Case	4
Pallet Case Qty.	36
Pallet Unit Qty.	144
Pallet Weight (lbs.)	1,733

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TABLE 2: THE CRACKER MIXING PARAMETERS^{1,2,3,4}

Properties	Temperature of Substrate to be Demolished					
	32 - 40 °F (0 - 4 °C)	41 - 48 °F (5 - 9 °C)	49 - 57 °F (10 - 14 °C)	58 - 72 °F (15 - 22 °C)	73 - 84 °F (23 - 29 °C) ⁵	85 - 100 °F (30 - 35 °C) ⁵
Maximum Mixing Water Temperature	110 °F (43 °C)	100 °F (38 °C)	85 °F (29 °C)	68 °F (20 °C)	40 °F (4 °C)	33 °F (1 °C)
Amount of Water per 11 lb.(5 Kg) bag	33 oz. (1 L)				39 oz. (1.16 L)	
Hole Diameter	1 1/2 in. (38 mm)				1 1/4 in. (32 mm)	
Minimum Hole Depth	7 1/2 in. (191 mm)				6 in. (152 mm)	
Optimum Installation Time	Warmest part of the day			Avoid the hottest part of the day	Early morning or late afternoon when substrate has cooled	Early morning or night when substrate has cooled
Other information	Use wet cloth or thermal cover / Heat the area			Cover with wet cloth to protect from sun		
Initial Cracking Approximate Time	24 - 48 hr	12 - 48 hr	5 - 18 hr	2 - 8 hr	2 - 4 hr	1 - 3 hr

- Hole should be dry and dust free.
- Install time should be within 5 minutes of completion of mixing.
- Storage temperature should be between 40 - 95 °F (4 - 35 °C).
- Hole spacing varies depends on substrate material and reinforcing.
- Unreinforced concrete slabs down to 4 in. (102 mm) thick can be broken up using a 1 3/8 in. (35 mm) drill bit. Leave at least 1 in. (25 mm) of concrete below the bottom of the hole.

Installation Instructions (MPII)

Precautions

- Read all instructions completely before using THE CRACKER®
- Follow exact instructions for product to work properly and safely
- Always wear rubber gloves, dust mask and protective goggles before starting job and avoid skin contact
- Refer to the Safety Data Sheet (SDS) available on our website at www.atcepoxy.com before use
- Clear demolition site of non-essential personnel and close the jobsite to the public
- THE CRACKER® should not be used in coal mines or other areas where there is a potential for ignition of gases as temperatures of the mixed product can turn very hot for a short period during the hydration process

Equipment

- 5 gallon (20 liter) plastic bucket for mixing THE CRACKER®
- Clean, cool water supply (ice will be required in warm environments)
- Calibrated measuring cup
- Jiffy Mixer attachment for 1/2 in. chuck electric drill; NOTE: Do not hand mix
- Handheld infrared thermometer

Water

The amount of mixing water is critical (see Table 2) and must be measured according to the temperature of the substrate to be demolished. NOTE: The addition of too much water can cause product failure or a blow out (See page 6).

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- Measure the temperature of the substrate using an infrared thermometer
- Make adjustments to water temperature according to Table 2
- To prevent overly rapid reaction, when ambient temperature and substrate temperature is 73 °F (23 °C) or above, it may be necessary to ice the mixing water
- In colder weather, mixing water may be slightly warmed to speed up the reaction and facilitate cracking

Hole Preparation

As with explosive blasting, THE CRACKER® must have an area of least resistance or one free edge toward which it can break. If you are in bedrock or removing part of a slab without free edges, an open face can be created by opening a small area with THE CRACKER® to provide relief.

Diameter

- When substrate temperature is greater or equal to 73 °F (23 °C), the hole diameter must be 1 1/4 in. (32 mm)
- When substrate temperature is below 73 °F (23 °C), the hole diameter must be 1 1/2 in. (38 mm)

NOTE: Smaller holes will decrease effectiveness and larger holes may be dangerous to the installer

Depth

- The depth of the hole must be at least 4 times the diameter
- Holes that are too shallow can create a blow out or product failure
- For maximum production, hole depth should be 85% - 90% of the substrate thickness
- Do not penetrate drill completely through substrate; THE CRACKER® will simply run out of the hole
- Maximum hole depth is 10 ft. (3.1 m)
- Lifts are recommended if breaking deep foundations or high wall or rock formations

NOTE: For best results, THE CRACKER® is recommended for use in concrete depths over 6 in. (152 mm). Results in slabs under 6 in. (152 mm) may vary depending on concrete. Recent testing resulted in successful cracking of the sizes below using unreinforced 3,500 psi (24.1 MPa) concrete slabs at a temperature range between 85 - 95 °F (29 - 35 °C) and 1 3/8 in. (35 mm) diameter holes located on 12 in. (305 mm) centers.

5 in. (127 mm) slab at depths of 4 in. (102 mm) per hole successfully cracked

4 in. (102 mm) slab at depths of 3 in. (76 mm) per hole successfully cracked

NOTE: In cooler temperatures, reduce hole spacing to 8 in. (203 mm) centers. It is recommended to test a small area to determine suitability of product use.

Conditioning

- All holes must be clean and dry
- Remove any dust from hole by blowing out the hole
- Allow drilled holes to cool from friction of drill bit
- If holes are located in sunny or hot condition, cool by addition of water
- Dry holes with compressed air prior to mixing THE CRACKER®

Spacing (see Hole Location on page 4)

- As a general rule, hole spacing can be on 12 in. (305 mm) centers in the substrate
- In substrate of extremely high tensile strength above 5,000 psi (34.5 MPa) hole spacing should be placed on 6 - 8 in. (152 - 203 mm) centers
- In unreinforced substrate of low strength, centers ranging from 14 - 15 in. (356 - 381 mm) may produce satisfactory results
- An initial test of holes spaced at 12 in. (305 mm) centers should be completed first before increasing or decreasing hole spacing
- If drilling in substrate of very low strength, never space holes at a distance less than the hole depth
- It is permissible to cast holes with PVC pipe in concrete being poured to be broken later
- It is recommended that 1 1/2 in. (38 mm) outside diameter pipe be used and removed
- If pipe is left in the concrete, do not leave pipe protruding above concrete surface
- If filled above surface with THE CRACKER®, a blow out can occur

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- NOTE: Check to assure pipe is not extremely hot if sitting in the sun
- If substrate is rock, it is recommended to test a small area to determine suitability of product use

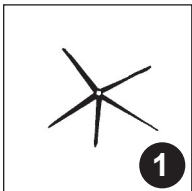
Pattern

- Hole pattern is determined by the strength or reinforcement of substrate to be demolished and by the size blocks or configuration of the object is to be broken (see Diagrams I, II & III)

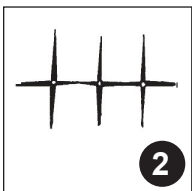
Estimating Quantity Required

- Temperature of the concrete or rock to be broken will determine hole size 1 1/4 in. (32 mm) or 1 1/2 in. (38 mm)
- Size of pieces into which you wish to break will determine hole pattern (See hole location section)
- Each 5 kg (11 lb.) bag of THE CRACKER®, mixed with water will fill 7 1/2 linear feet (2.3 m) of 1 1/2 in. (38 mm) holes or 10 ft. (3.1 m) of 1 1/4 in. (32 mm) holes
- Hard rock or reinforced concrete requires one to three bags per cubic yard, depending on the size into which it will be broken
- Boulders often require less than one bag per cubic yard - production can be up to four cubic yards per bag, depending on the size into which the boulder will be broken
- Formulas for calculating quantities:
 - 1 1/2 in. (38 mm) holes: number of holes x depth of holes in feet divided by 7.5 = # of 5 kg (11 lb.) bags
 - 1 1/4 in. (32 mm) holes: number of holes x depth of holes in feet divided by 10 = # of 5 kg (11 lb.) bags

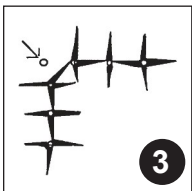
Hole Location - Directing the Cracks



An individual drill hole or evenly scattered drill holes produce a random crack development

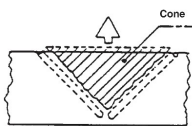


Neighboring drill holes will promote a crack along the axis of the drill holes



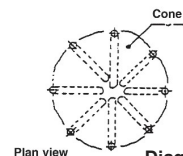
Omitting to fill a corner drill hole relieves the tension in two main crack lines thereby enabling them to combine in a curve

Making Openings in Walls and Roofs



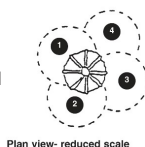
Section
Diagram I

To ensure that no undesired reaction forces are developed at the point where ceiling and wall are bonded, it is necessary first to remove a cone-shaped portion as illustrated in Diagrams I & II in accordance with the principle applied when cracking rocks.



Plan view
Diagram II

Diagram III

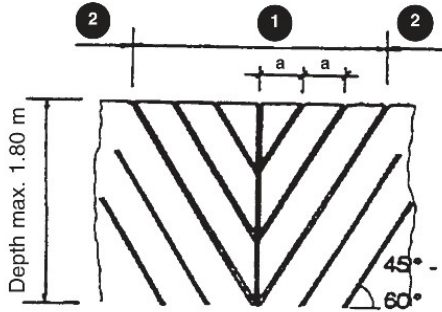


Plan view- reduced scale

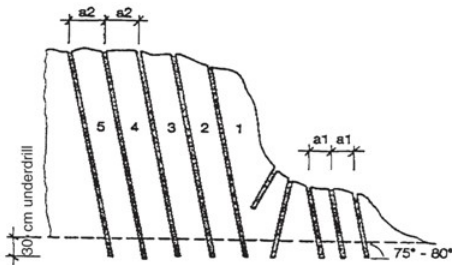
In vertical walls, drill with a slightly downward slope; then systematically enlarge the craters as shown in Diagram III.

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Cracking Rocks



If a rock formation does not have free access from the side, it is necessary to crack an opening which provides access. The drilled holes (1) of the opening are filled with THE CRACKER® and then, at one hour intervals, the drilled holes (2) are filled, one row after the other.



With rock formations it is first necessary to fill the holes at the foot of the formation (i.e. the foot holes) with THE CRACKER® (a1). It is advantageous to drill these closer together than the actual demolition holes (a2). As discussed above, each row of holes must be filled at intervals with THE CRACKER®, i.e., one row after the other.

Mixing & Using THE CRACKER®

1. Gather all necessary items according to Precaution, Equipment and Water (and ice if necessary) sections.
2. Use an infrared thermometer, determine the temperature of the substrate to be demolished.
3. Consult Table 2 for correct hole size, amount & temperature of mixing water, time of installation and other recommendations.
4. Pre-drill holes according to Hole Preparation section.
5. Measure correct amount of water and prepare by icing or warming to the temperature specified in Table 2. NOTE: Never add unmeasured water to product using a hose.
6. When substrate is below 73 °F (23 °C), use 33 oz. (1.0 L) water per 11 lb. (5 kg) of THE CRACKER. NOTE: Do not add extra water as it will slow or stop reaction. At first, THE CRACKER® will appear to be too dry, but will liquefy itself as mixing proceeds.
7. When substrate is above 73 °F (23 °C), use 38.5 oz. (1.14 L) water per 11 lb. (5 kg) THE CRACKER®. The additional water is essential in warmer environments and reduces the chances of a blow out. NOTE: THE CRACKER® should also be kept as cool as possible prior to mixing it in warm weather.
8. Pour THE CRACKER® into the water and immediately begin mixing with a 1/2 in. electric or pneumatic drill with a Jiffy Mixer attachment. NOTE: Time elapsed should not exceed 5 minutes from beginning of mixing. Hand mixing is not recommended as it can take too much time to achieve the correct consistency and increase the danger of a blow out.
9. Mix only until a smooth, pourable liquid consistency develops with virtually no lumps. NOTE: If over mixed or allowed to stand in the bucket, THE CRACKER® will thicken and begin to react.
10. Begin filling holes nearest free edges or open face and work toward the center or away from free areas. Fill product mixture to top of holes. **NOTE: Avoid peering down and over holes at all times.**
11. Pour the water and product mixture directly from bucket into clean, pre-drilled holes immediately upon achieving a smooth liquid consistency. NOTE: Do not use any type of funneling device and do not attempt to pump prepared mixture into the hole. If steam develops in the bucket at any time, immediately add at least 1/2 gallon (1.9 L) of water to stop the reaction. NOTE: Do not pour fresh mixture into holes partially filled from a previous batch. Do not plug holes or place heavy objects on top of hole.
12. Cover holes with wet cloth if personnel will remain in the area or if holes are exposed to sunlight in high temperatures.
13. Do not leave unused mixture in the container as high temperatures will develop and expansion will ensue.
14. Pour any unused material from the bucket onto the ground (non-hazardous) and dilute with cool water.

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Precautions & Usage

ACTIONS THAT MAY CAUSE BLOW OUT- Product spurting or exploding out of the hole

- Use of water that is too warm (see temperature chart & mixing instructions)
- Use of too little water (see temperature chart & mixing instructions)
- Waiting too long to install after beginning to mix (never wait more than 5 minutes in warm weather)
- Holes of too large diameter (Strictly follow all measurements in Table 2) - never over 1 1/2 in. (38 mm)
- Holes that are too shallow (must be at least 4 times the hole diameter)
- Hole spacing which is too close in hot weather
- Dust in the holes which can absorb the water
- Installation of THE CRACKER® in the hottest part of the day in warm weather, when substrate is heated and the sun will be directly on it; Consider early morning or evening installation
- Allowing a container of THE CRACKER® to become super-heated (standing in sun or in hot vehicle) prior to usage; Keep THE CRACKER® as cool as possible

ACTIONS THAT MAY CAUSE PRODUCT FAILURE

- Use in extreme cold temperatures below 32 °F (0 °C)
- Use of too much water (strictly follow all measurements in Table 2)
- Allowing moisture into, or contamination of, the stored product
- Water, dust or other materials left in holes
- Holes with too small diameter- less than 1 1/4 in. (32 mm)
- Hole spacing too great in hard rock or heavily reinforced concrete
- Use of THE CRACKER® without free edges or an open face toward which it can break

TABLE 3: THE CRACKER USAGE COMPARISON

Effect Method	Breaking Power	Situation on the Site				Safety	Safety Precaution Simplicity	Economy
		Noise	Dust Gas	Vibration	Rockfall			
Hydraulic Wedge	—	●	●	●	●	●	●	—
Rock-Breaker	○	○	*	*	●	*	●	○
Concrete Cracker	*	○	—	○	○	○	—	○
Explosive (dynamite)	●	—	—	—	—	—	—	●
The Cracker	*	●	●	●	●	●	●	*

- Very good or not ecologically harmful
- * Good
- Poor or somewhat ecologically harmful
- Unsatisfactory and/or ecologically harmful