

# ADCO CRACK POWDER 3800

## Quarrying and Demolition Agent

ADCO  
Construction-  
and Mining  
Chemicals

www.adcon-namibia.com



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### DESCRIPTION

ADCO Crack Powder 3800 is an environmental friendly non-explosive demolition agent. It is noise-free, creates no vibration or flying rocks and leaves no debris.

### USES, ADVANTAGES

When mixed with clean and cold water to form a mortar like substance, and poured into pre-drilled holes of rock or concrete, it swells and exerts expansive capabilities on the hole-wall at a unit value of more than 50 MPa (500 kg / cm<sup>2</sup>) without vibration, ash, toxic gas and flying rocks. It is safe, environmentally friendly, non-explosive, requires very little training of personnel, easy to use and controllable.

In addition, the use of ADCO Crack Powder 3800 is not restricted to the holders of blasting certificates alone, which in terms of Local Legislation governs the usage of explosive materials.

### APPLICATION

ADCO Crack Powder 3800 can be applied in various situations :

1. Granite, marble, sandstone, limestone, quartzite quarrying and cutting.
2. Rock splitting, fracture and cutting.
3. Concrete structures demolition where explosives are prohibited.
4. Fracture and demolition of concrete buildings and structures.
5. Rock breaking for road construction, pool installations and trenching for various needs.

### USES

The safe use of the product depends on following instructions, and wearing safety goggles at all times. Although non-toxic, ADCO Crack Powder 3800 is caustic, and can cause severe eye injury if gets into contact with the eyes while mixing or pouring.

The chemical reaction of ADCO Crack Powder 3800 and water generates heat. When this reaction takes place too quickly, the temperature goes above the boiling point of water before all the water has chemically combined with the ADCO Crack Powder 3800. This can result in a steam-driven explosion which blows the powder from the hole with sudden force.

To avoid blowouts, follow the instructions regarding mixing, water temperatures and hole sizes chart. Always wear safety goggles and never use drill holes larger than 60 mm diameter (38 mm is recommended). Blow dust out of holes after drilling, and keep ADCO Crack Powder 3800 cool before use. Stop filling holes when ADCO Crack Powder 3800 approximately 30 mm from the top.

### Hole Depth :

1. Maximum Hole Depth is 5 meter.
2. Minimum Hole Depth is 4 times that of the hole diameter. Example – 100 mm depth for 25 mm hole diameter, 120 mm for 30 mm. Holes shallower than 4 times diameter are likely to blow out.
3. In reinforced concrete, drill 85% to 90% of the concrete depth. In face, drill as deep as you want to remove. In boulders, drill two thirds to three quarters of the rock's thickness.

### Demolition :

For vertical and downward situations, it is necessary to identify that there is at least one free face available. The diameter of holes is crucial to the cracking results. Holes that are too small are not conducive to the good performance of ADCO Crack Powder 3800, and over large holes may cause blow out.

Rock drills with a diameter of 30 – 40 mm is recommended. If the cracked objects are isolated, the depth of drilled holes is equal to 80 – 90% of the objects thickness. If used in Marble and Granite quarrying and mining, the depth of drilled holes is equal to 105% of the object's thickness.

Materials to be cracked	Hole design			Approximate ADCO Crack Powder 3800 (kg / m <sup>2</sup> )
	Diameter (mm)	Length (cm)	Depth	
Soft Stone	35 – 50	40 – 60	H + 5% H	8 – 10
Hard Stone	35 – 65	40 – 60	H + 5% H	10 – 15
Rock Cutting	30 – 40	20 – 40	H	5 – 15
Plain Concrete	35 – 50	40 – 60	80% H	8 – 15
Reinforced Concrete	35 – 50	15 – 30	90% H	15 – 25

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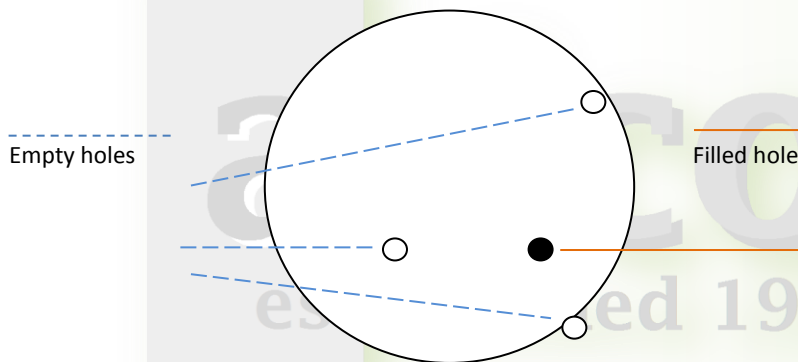
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### USES (cont'd...)

#### Hole Pattern :

1. Holes must be drilled so as to allow a free face for the ADCO Crack Powder 3800 to push forward. For example, drilling at a 45° angle in a flat surface of ledge will push it upwards, but drilling straight down might not allow anywhere for the pressure to go.
2. To demolish a slab without pushing out the walls which surround it, drill a cone shaped pattern at the centre and fill these holes first. The cone will pop upwards and create a free face.
3. Hole pattern depends on tensile strength of what you are breaking, amount of rebar if any, and size of the pieces you want when you are done. This can often be determined by experiment.
4. Hole pattern also depends on how fast you need results. More holes spaced closer together will give faster break times and smaller pieces, but this will require additional powder.
5. Boulders are much easier to break than reinforced concrete or ledge, and drill holes can be spaced further apart, especially if breaking speed is not limited.
6. When removing part of a slab, to prevent cracks from spreading into the rest of the slab. Drill holes every 15 cm in a line between the 'demolish section and the 'keep' section. Leave every hole empty along this line.
7. Empty holes can also be used to direct cracks, it may save on costing. For example, if you want to break a boulder into thirds, you can use this pattern:



### TEMPERATURE

Rock or Concrete Temp	Water Temp.	Hole Size
-10° to 4°C	40° C max	38 mm
5° to 14°C	30° C max	38 mm
15° to 25°	15° C max	38 mm
25° and above	Cold water	38 mm

Mix with clean and cold water before use. In a ratio of 1:3 of the overall weight, please put the required volume of water 1.5 – 1.65 L into a container, then gradually add one bag of 5 kg of ADCO Crack Powder 3800 into water and stir all the time to obtain a smooth, lump-free slurry. If mixing has to be made by hand, please wear rubber gloves. When rock or concrete is above 20°C, add 150g of extra water per 5 kg ADCO Crack Powder 3800.

#### Notes on Temperature :

- Hole temperature can often be reduced by waiting until late night or early morning.
- When rock or concrete is above 25°C, do not mix ADCO Crack Powder 3800 with warm water.
- When rock or concrete is above 25°C, do not mix more than one bag of ADCO Crack Powder 3800 (5 kg) at a time.
- Measure the rock or concrete temperature. Tie a string to a thermometer and drop it deep into the drill hole.

### MIXING

1. Wear safety goggles and clear the area of all non-essential personnel.
2. Measure temperature of drill holes.

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### MIXING (cont'd...)

3. Add clean water of proper temperature to a plastic mixing bucket, see temperature chart.
4. Slowly add one bag (5 kg) of ADCO Crack Powder 3800 into bucket with water while you are mixing.
5. Begin mixing immediately with electric drill with mixing attachment or hand with rubber gloves.
6. ADCO Crack Powder 3800 seems dry at first, do not add more water.
7. Mixing plus filling the drill holes should exceed no more than five minutes.
8. Fill holes as quickly as possible. Do not plug holes (horizontal holes need capping) or place heavy objects on holes.
9. Cover holes with a tarpaulin if people will remain in the area.

### FILLING HOLES

Clean holes before filling, using air hose to remove excess dust from drilling.

ADCO Crack Powder 3800 slurry should be poured into holes within 5 min after mixing. Do not fill to the top, only fill the holes to about 30 mm from the top.

Mix well and pour into holes while agitating the hole to fill any possible air pockets.

For Horizontal holes, a grouting pump would be most reliable to operate. Or you can insert a slightly smaller plastic pipe into the hole, and then fill the expansive mortar into the pipe slowly, withdrawing the pipe from the hole simultaneously. Quickly block the hole with a cap after filling.

### CHEMICAL PROPERTIES

ADCO Crack Powder 3800 is a greyish white powder and is composed of multi-structured inorganic particles. There is no content of any harmful composition.

Factors affecting the expansive pressure of ADCO Crack Powder 3800 :

1. The expansive stress of ADCO Crack Powder 3800 reaches maximum value in about 24 hours of reaction, however, it still increases thereafter.
2. The expansive stress of ADCO Crack Powder 3800 will decrease if water ratio increases.
3. The expansive stress of ADCO Crack Powder 3800 will increase with rising temperature.
4. The expansive stress of ADCO Crack Powder 3800 would be higher if the diameter of pre-drilled hole is bigger. (However the diameter should never exceed 60 mm.)

The speed of splitting is determined by the reaction speed, which is up to the temperature of the job site. The higher the temperature, the shorter the reaction time.

### What can cause a Blowout?

1. Using too large a hole diameter, 60 mm is maximum. (See temperature chart.)
2. Using too warm mix water. (See temperature chart.)
3. The ratio of water is less than 1:3, especially when rock or concrete is above 25°C.
4. Excessive dry dust in holes can absorb water from mixed ADCO Crack Powder 3800.
5. Too much time passing between beginning to mix and filling holes.
6. Unconfirmed drill hole temperature.
7. Unconfirmed water temperature.
8. Holes that are too shallow, Depth must be 4 times diameter or more.

### FILLING

For vertical holes, pour ADCO Crack Powder 3800 mixed with water directly into the hole. Push the mortar fill into the holes with a slightly smaller piece of metal, stick or pipe. For very deep holes, push the mortar section by section. For horizontal and slant holes, insert a slightly smaller plastic pipe into the hole, and then fill the expansive mortar into the pipe slowly, withdrawing the pipe from the hole simultaneously. Quickly block the hole with a cap after fill. A slurry pump may also be utilized for filling horizontal holes.

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### Safety Tips :

1. Make sure the holes are clean and no water and residue is left in the holes, or use high-pressure air hose to clean out.
2. Fresh expansive mortar should be poured into the hole within maximum 10 minutes after mixing.
3. The feeding depth is 100% of the pre-drilled hole.
4. Make sure the temperature of the hole meets the requirement before filling with mortar.
5. The batch of ADCO Crack Powder 3800 mixed each time should not exceed the necessary requirement. All the workers on duty should ensure a smooth flow of mixing, stirring and filling, which is the guarantee of maximum expansive stress of all holes occurring at the same time.
6. Warm or bubbling mortar must not be used to fill holes. It will cause a blowout.

### PACKAGING AND STORAGE

ADCO Crack Powder 3800 is packed in moisture-proof carton box with 4 plastic bags of 5 kg in each. The net weight is 20 kg. The validity period of ADCO Crack Powder 3800 is one year if stored in a dry place, under constant temperature and without any damage to package.

### QUALITY ASSURANCE

Our manufacturing and testing procedures comply with relevant standards.

### SAFETY

ADCO Crack Powder 3800 is not considered toxic or dangerous, however, the use of standard industrial precautions such as protective clothing, gloves and eye goggles is recommended.

Remember : Keep away from children, handle responsibly and consider the environment.

### TECHNICAL SUPPORT

Detailed method statements for various applications are available on request.

Site training can be arranged.

### UPDATE

May 2017.

This supercedes all previous documentation.