BRISTAR
NON-EXPLOSIVE DEMOLITION AGENT

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WARNING

Do not use BRISTAR for purposes other than cracking rocks or concrete as instructed in this brochure.

To Prevent Blown-out Shots

1. Do not use BRISTAR beyond the temperature range, hole diameter, water temperature and temperature of BRISTAR as indicated in Table 2 on page 7.
2. Do not mix over one bag (5 kgs, 11lb.) of BRISTAR with water at a time.
3. BRISTAR mixed with water should be poured into holes within 10 minutes. (DO not leave BRISTAR in a mixing container. Remaining BRISTAR should be diluted with a great deal of water and then disposed of on open ground.)
4. Do not pour and leave BRISTAR in glass containers, cans, etc.
5. Do not pour BRISTAR into vinyl chloride pipes. (In case of demolishing a temporary concrete structure, be sure to use spiral sheath pipes.)
6. Do not tamp the entrance of the holes with sand, mortar or any other materials.
7. Do not tamp holes with a bar.
8. Do not use hot water.

To Prevent Accidents Caused By Blown-out Shots

1. Always wear PROTECTIVE GLASSES, RUBBER GLOVES and HARD HATS during work.
2. Do not look into holes directly for at least 10 hours.
3. Do not stay near the holes for at least 10 hours after filling.
4. Cover the holes with a cloth or plastic sheet.
5. Forbid anyone to enter the job site after filling.
6. Wear a DUSTPROOF MASK in case of using BRISTAR in a closed area such as tunnel.
7. When any portion of the skin comes in contact with BRISTAR, rinse it off with water immediately.
8. When eyes come in contact with BRISTAR, rinse them off with water immediately and consult an ophthalmologist.

Blown-out Shot


Picture 1: Blown-out shot

A blown-out shot is that the BRISTAR filled into a hole spurts out from the hole when it is not used properly (Refer to Picture 1).
The blown-out shot occurs in succession 3-4 times after it occurs once, and it may occur in other holes. Therefore, do not rush to the field when the blown-out shot occurs.
BRISTAR consists mainly of Calcuim Oxide which is corrosive and is also a highly alkaline product. Loss of eye sight may occur if BRISTAR comes.

KEEP OUT OF REACH OF CHILDREN

WHAT IS BRISTAR

BRISTAR is a non-explosive demolition agent which is quite different from ordinary demolition agents such as explosives and dangerous materials. It does not cause any flyrock, noise, ground vibration, gas, dust or any other environmental pollution when used properly.
As requirements for demolishing rock or reinforced concrete in construction increase in tight quarters, the use of explosives and explosive agents are becoming more restricted as far as safety and environmental pollution problems are concerned.
BRISTAR is a solution.
When BRISTAR mixed with an appropriate quantity of water is poured into cylindrical holes drilled in advance in rock or concrete to be demolished, it hardens and expands and then causes cracks systematically. After that, the material with cracks can be easily removed with a pick hammer, a pneumatic breaker, an excavator, etc.

ADVANTAGES

1. SOUNDLESS CRACKING
Unlike the exsisting method of demolition done by explosives or breaking equipment, BRISTAR quietly and gradually demolishes rock or concrete with its expansive stress (more than 30 N/mm ^{2} caused by hydration reaction, so that BRISTAR does not cause any noise, vibration, flyrock, dust and gas.

2.NO LICENSE.
Using BRISTAR does not require a special license unlike explosives, explosive agents, etc.

3. SIMPLE HANDLING.
Neither capping with mortar, sand, etc. nor tamping with a bar is necessary after BRISTAR mixed with water is poured into drilled holes in rock or concrete.

4. SYSTEMATICAL DEMOLITION AND DEMOLITION IN WATER
BRISTAR can demolish rock or concrete systematically, and also demolition work in water is possible.

5. HIGH-EFFICIENCY DEMOLITION WORK.
Since rock or concrete previously cracked with BRISTAR is easily broken with breakers etc., the amount of time required for breaking of rock or concrete can be remarkably reduced.

COMPARISON OF DEMOLITION METHODS

There are many superior points in the demolition work performed by "BRISTAR" as compared with the other demolition methods. It is also seen to be more economical.
The outline is indicated in Table1.

Table 1. Comparison of BRISTAR with others

Kinds	Breaking Power	Situations at the work site				Safety	*Simplification of Protection	Economy*
		Noise	Ground Vibration	Dust Gas	Flyrock			
Explosives (Dynamite)	◎	×	×	×	×	×	×	◎
Explosives (Concrete Cracker)	○	△	△	×	△	△	×	○
Rock breaker	△	△	○	○	◎	○	◎	△
Hydraulic Splitter	○	◎	◎	◎	◎	◎	◎	×
"BRISTAR"	○	◎	◎	◎	◎	◎	◎	○

◎ Superior (or Pollution-free)
○ Good
△ A little inferior
× inferior (or with pollution)
*Results differ subject to the circumstances

USES OF BRISTAR

Since BRISTAR demolishes objects by expansive stress, it is used for various purposes. In particular, BRISTAR is very suitable for demolition work in tight quarters where large-sized breaking machines or explosives cannot be used due to their causing environmental problems.

ROCK

1. Splitting of boulders
2. Slabbing
3. Excavation of rock wall or bedrock
   1) for road expansion
   2) for harbour expansion
   3) for residential development
   4) for various types of construction work etc.
4. Excavation associated with tunneling
5. Trenching,Shaft sinking
6. Quarrying
7. Others

CONCRETE

1. Demolition of mass concrete
2. Demolition of foundations for machinery and structures
3. Demolition of pillar, beam, wall or slab of bridges
4. Demolition of temporary concrete structures
5. Demolition of piers
6. Demolition of retaining wall
7. Partial demolition of various concrete structures
8. Others

OTHERS

1. Demolition of fire-bricks
2. Demolition of bricks for structures

PROPERTIES

1. CHEMICAL COMPONENTS OF BRISTAR

BRISTAR is a powder product consisting of Calcium Oxide and an organic material.

2. SOME EFFECTS ON THE EXPANSIVE STRESS OF BRISTAR

1)The expansive stress increases more than 30 N/mm^2(Fig.1 & Fig.2). Generally, the compressive fracture stress of rock is 100 to 200 N/mm^2 and that of concrete is 15 to 50 N/mm^2. However, the tensile fracture stress is very small, for instance, it ranges from 4 to 7 N/mm^2 in rock and 1.5 to 3 N/mm^2 in concrete.
Since demolition with BRISTAR is based on a fracture due to a tensile stress, all kinds of rock and concrete can be cracked and broken with BRISTAR when appropriate holes are properly drilled.

2)The larger the hole diameter is, the greater the expansive stress becomes (Fig.3).

3)There is little change in the expansive stress when the water ratio is in the neighborhood of approximately 30%. However, the stress is decreased as the water ratio is increased or decreased.

4)The expansive stress along the hole depth is almost constant except for that near the entrance of holes.
Generally, the expansive loss from the hole entrance has little effect on the demolition work when the hole depth is enough.

5)When BRISTAR is properly used within the parameters as noted in the conditions, no spurt due to heat generation (blown-out shot) occurs, because of the BRISTAR's strong adhesion and frictional resistance to the upper surface of the hole.

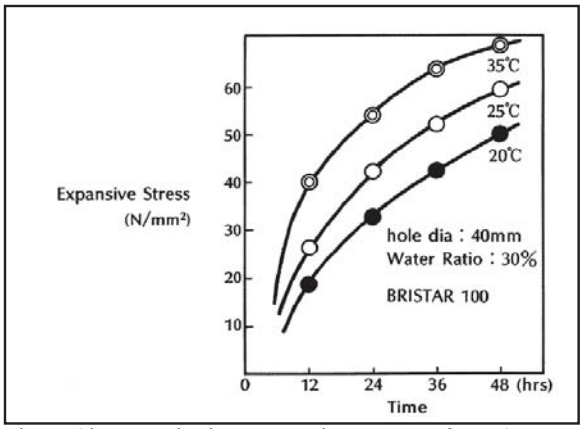


Fig.1: Changes in the expansive stress of BRISTAR100

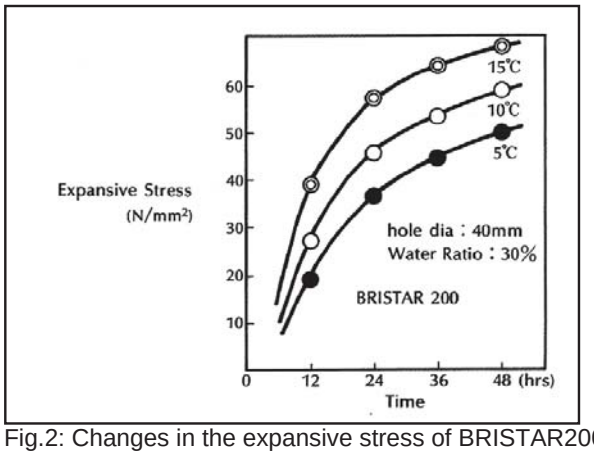


Fig.2: Changes in the expansive stress of BRISTAR200

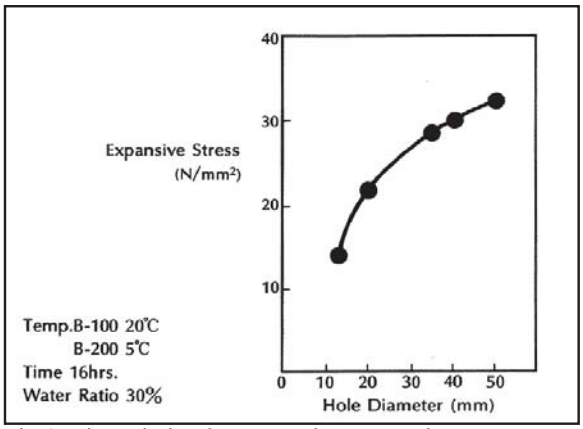


Fig.3: The relation between the expansive stress and hole diameter

FRACTURE MECHANISM

After BRISTAR is poured into holes drilled in rock or concrete, the expansive stress gradually increases with time and it becomes more than 30 N/mm^2 at room temperature after 16 hours.
As BRISTAR generates its expansive stress, the object to be cracked undergoes a process of (1) crack initiation, (2) crack propagation, and (3) the increase of crack width.
Therefore, this fracture mechanism is distinguished from a breakage by blasting.

The mechanism by the expansive stress of BRISTAR is shown in Fig.4. Cracks initiate from an inner surface of the hole, being caused by tensile stress at a right angle with the compressive stress which occurs by the expansive stress of BRISTAR. Then, as the expansive stress of BRISTAR is kept up even after the appearance of cracks, the cracks propagate and also new cracks initiate during the process. Usually, for a single hole, 2-4 cracks initiate and propagate. When a free surface exists, the crack, as shown in Fig.5, is pushed apart mainly by the shear stress, and a secondary crack also arises from the bottom of the hole running toward the free surface. When multiple numbers of holes that are properly adjacent to each other, are filled with BRISTAR, the cracks from the hole propagate to connect with the neighboring holes, as shown in Fig.6. It is, therefore, possible to determine the directions of the cracks by appropriately arranging the hole spacing, its depth and its inclination.

Fig.4:Fracture Mechanism by the expansive stress of BRISTAR

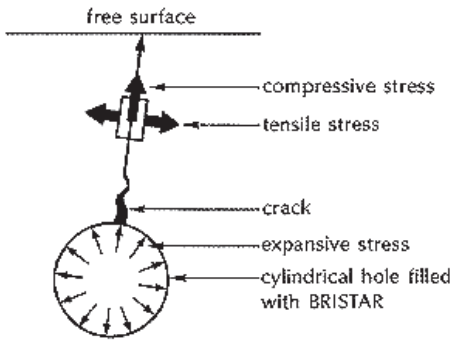


Fig.5:Sectional-view of the crack formation in the material with two free surface

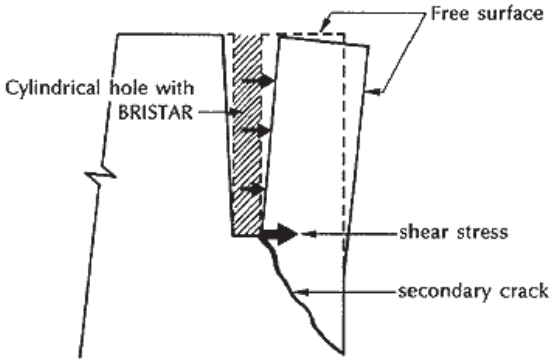
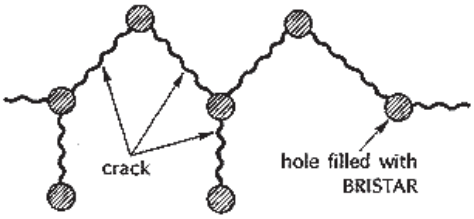


Fig.6:Crack propagation



Establishment of Free Surface

In the case of trenching, shafting or tunneling, if all holes are drilled vertically and filled with BRISTAR, the crack width cannot increase but horizontal cracks are initiated.
Therefore, in order to obtain two free surfaces, inclined holes or presplitting is required.

TYPE OF BRISTAR

Table 2: Type of BRISTAR

Item / Type	(1) Hole Diameter	(2) Temperature of material to be cracked	(3) Water temperature	(4) Temperature of BRISTAR	Case color "B" of BRISTAR
		35 30 25 20 15 10 5 0 -5 °C 95 86 77 68 59 50 41 32 23 °F			
BRISTAR 100	36-50mm (1 3/8"-2")	35-15℃ (95-59°F) Delay of fracture time	max. 30℃(86°F)	max. 35℃(95°F)	Blue
BRISTAR 150		20-10℃ (68-50°F)	max. 15℃(59°F)	max. 20℃(68°F)	Green
BRISTAR 200		15-5℃ (59-41°F)	max. 10℃(50°F)	max. 15℃(59°F)	Red
BRISTAR 300		Do not use in this range (Blown-out shot may occur) 5- -5℃ (41-23°F)	max. 5℃(41°F)	max. 5℃(41°F)	Orange

BRISTAR may blow out of the holes due to heat generation when hole diameter exeeds 50mm(2 inches) or when BRISTAR is used at temperatures over the above.
Do not use each type of BRISTAR beyond the above conditions of (1) (2) (3) and (4).

PACKAGE

CONTAINER

BRISTAR is pacaged in 4 anti-moisture plastic bags of 5 kgs (11 lb) each , and the bags are placed in a carton box with a total net weight 20 kgs (44 lb).

Sister Products
BRISTAR PACK=Cartridge type=
18kg/carton box
(15cartridges/bag×4bags)
(1 cartridge=300g, Ø34mm×200mm)

STORAGE

1.Store BRISTAR in a dry place and use it as soon as possible. Though BRISTAR is packed in anti-moisture plastic bags, long storage may cause deterioration of its working ingredients.

2.When storing, do not place the cartons or the bags of BRISTAR directly on a floor. Put them on a pallet and keep in a dry warehouse etc. BRISTAR stored in above-mentioned way can be effectively used for about 1year.

3.BRISTAR should be unpacked right before use.

4.When storing the portion of BRISTAR remaining after use, push the air out of the bag, then seal it with gum tape and use it as soon as possible.
However, since it may get exposed to moisture, there is a risk of BRISTAR losing its effectiveness once the bag has been opened.

5.If you receive broken bags of BRISTAR, they may not work due to possible moisture absorption.

STANDARD QANTITY

The quantity of BRISTAR to be used for cracking differs with the hole diameters and hole spacing. In Table 3, the relation between the quantity of BRISTAR used and the hole diameters is indicated for a hole of 1 meter in length, where BRISTAR was mixed at a water ratio of 30%.

Table 3 : Quantity of BRISTAR used per hole length and hole diameters

Hole Diameter (mm)	36	38	40	42	44	46	48	50
BRISTAR (kg/m)	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2

Hole Diameter (inch)	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
BRISTAR (lb/yd)	3.1	3.7	4.4	5.1	5.8	6.7

5kgs of BRISTAR is usually used in case 1m^3 of virgin rock is demolished (8.4lb/yd^3).
For fragmentation and reinforced concrete ,an amount 2 to 4 times that is required.

Table 4 : Quantity of BRISTAR used per 1 m^3

Kinds of Objects to be demolished			Standard Quantity of BRISTAR per 1 m^3
ROCKS	Soft Rock		5-8kg(11-17.6lb)
	Medium Rock		8-12kg(17.6-26.4lb)
	Hard Rock		12-20kg(26.4-44lb)
CONCRETE	Plain Concrete		5-8kg(11-17.6lb)
	Reinforced Concrete	Concrete including less quantity of re-bars	10-25kg(22-55lb)
		Concrete including much quantity of re-bars	20-35kg(44-77lb)
BRICKS	Anti-fire brick		10-25kg(22-55lb)

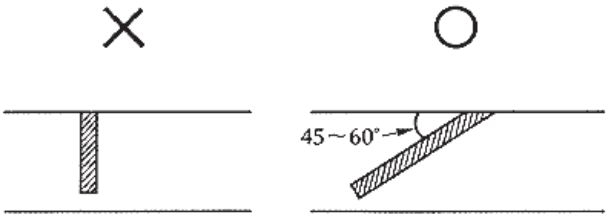
* When an object with two or more free surfaces is demolished perfectly, the quantity of BRISTAR shown in the above Table is required.
* In case of demolition of boulders or bed rock, the required quantities of BRISTAR are 80% or 110% of indicated quantity in the above table, respectively.
* In case of demolishing an object which has only one free surface or partial demolition etc. to smaller-sized blocks, the required quantities of BRISTAR increase in comparison with those shown in the above Table.

HOLES FOR BRISTAR

1. Hole Diameter
Allowable range of hole diameter for BRISTAR is 36- 50mm (1 3/8" -2").
The larger the hole diameter is, the greater the expansive stress becomes and the wider the hole spacing becomes.

2. Hole Length
This varies with the shape of the object to be demolished or the break plan. (Refer to Table 5 regarding standard hole length.)
When the length is less than 3 times that of the hole diameter, less cracking will occur, the breaking effect is lessened and the time required for demolition is increased.

3. Angle of Hole
It is preferable to drill holes vertically, but in case of a thin material, consideration should be given so as to make a long hole by drilling it obliquely since a greater effect is achieved with a deeper hole.



4. Hole Spacing
Hole spacing varies with the properties of rock, joint, volume to be removed, conditions of free surface, quantity of re-bars, secondary breaking, work period etc.

Table 5 : Hole Length

Kinds of objects	Hole Length
Boulder	80% of height
Bench	105% of height
Concrete	90% of height

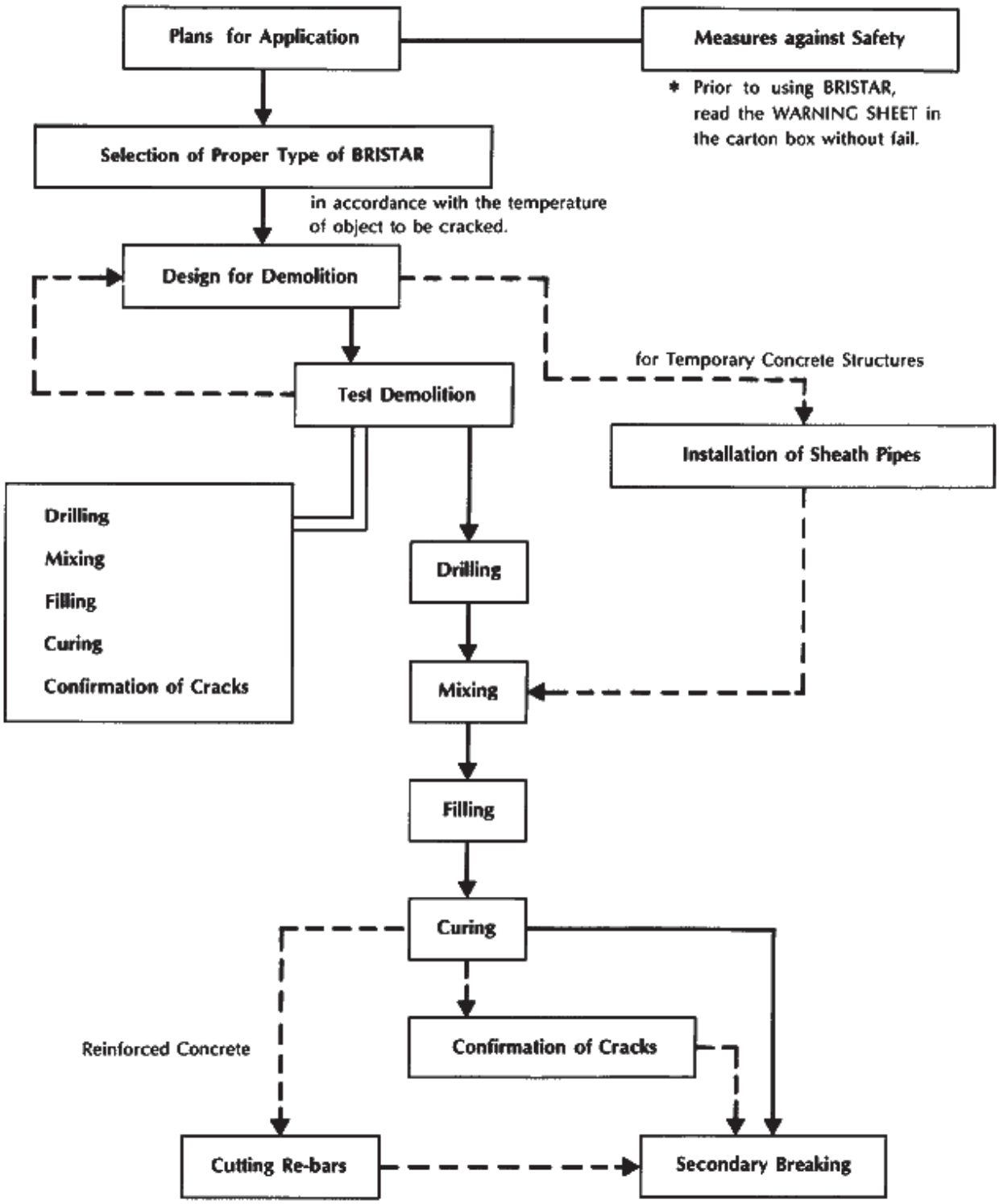
Table 6 : Hole Spacing for Rock

Kinds of Rocks	Hole Spacing
Hard Virgin Rock	40-60cm 1' 4"-2')
Soft Virgin Rock	50-70cm (1' 8"-2' 4")
Presplitting of the above Rocks	30-60cm (1'-2')

Table 7 : Hole Spacing for Concrete

Kinds of Concrete	Quantity of Re-bars (kg/m^3)	Hole Spacing
Plain Concrete	0-30	40-70cm (1' 4"-2' 4")
Reinforced Concrete	30-60	30-40cm (1' - 1' 4")
	60-100	25-35cm (10" - 1'2")
	over100	20-30cm (8"-1')

APPLICATION OF BRISTAR



Selection of Proper Type of BRISTAR

Referring to Table 2 on page 7, to avoid blown-out shots the proper type of BRISTAR should be selected in accordance with the temperature of the object to be demolished.

NOTE :When the season is shifting, ex. winter to spring, or when tunnel or underground demolition work is carried out, carefully select the proper type of BRISTAR in accordance with the temperature of the object to be demolished, not outdoor temperature, because the temperature of the object is often great[y different from the outdoor temperature. If the temperature of the object is higher than the outdoor temperature and the type of BRISTAR selected in accordance with the outdoor temperature is used, blown-out shots will certainly occur.

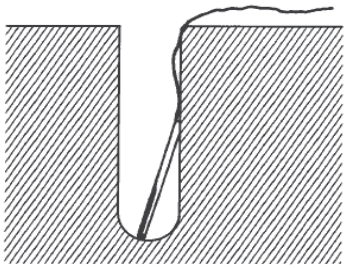
Temperature Estimation

As shown in Fig.7, place a thermometer in the bottom of the hole and leave it in place for 2-3 minutes.

Then quickly pull out the thermometer and take a reading.

NOTE :Avoid taking temperature right after drilling since the temperature of the hole is higher because of friction heat.

Fig.7:How to take temperature



Test Breaking and Drilling

Since work using BRISTAR depends on the placement of the holes, the drilling must be done in relation to the job to be performed.

Prior to the execution of test breaking, reference should be made to "Example of Hole Design for Demolition" in this brochure to assist in break design.

To determine what combination of hole size and spacing is most desirable, drill several holes of different diameters at different burdens and spacing, check the break condition of each and then decide hole diameter, length, burden and spacing.

Drilling

Drill holes designed for demolition with a drilling machine.

(1)Drilling machine : Jack Hammer, Leg Hammer etc.

(2)Drilling Direction : It is preferable to drill holes vertically, but in case of a wall or pillar of reinforced concrete where vertical drilling is hard, an inclined hole may be drilled. For horizontal holes, the same idea of spacing as with vertical holes can be applied. Try to drill horizontal holes with some slope.

(3)Drilling machine : Use of Spiral Sheath Pipes

In the case of a temporary concrete structure (to be demolished), place spiral sheath pipes as holes before placing concrete. When the structure needs to be cracked, fill the holes with BRISTAR after removing the spiral sheath pipes.

There is no change in breaking effect by the use of spiral sheath pipes.

However, spiral sheath pipes of 36-50mm (1 3/8"-2") diameter should be used.

NOTE : Never use vinyl chloride pipes etc. instead of spiral sheath pipe.

Leg Hammer

Spiral Sheath Pipe

APPLICATION OF BRISTAR

Mixing

1. Equipment

(1) Container : For one bag of BRISTAR-a metal round-shaped bucket or clean can with 10-20 liters capacity
(2) Mixer : For instance, hand-mixer with saucer typed blade (Hand mixing is available.)
(3) Water Measure : Beaker or measuring cylinder
(4) Protector : Protective Glasses, Rubber Gloves, Dust-proof mask


Equipment for Mixing


Protectors

2. Mix Proportion

BRISTAR : 5 kgs (11 lb, 1 bag)
Water : 1.5 liters (0.4 US gallon)
Yield Volume : Approxmately 3.1 liters
NOTE :Standard water ratio to BRISTAR is 30%.

3. Mixing Method

(1)Pour 1.5 liters (0.4 US gallon) of clean water into a container beforehand and add one bag (5 kgs 11 lb) of BRISTAR gradually and mix well until it has good fluidity.
(2)When the viscosity of the mixture of BRISTAR and water is too high to pour into holes, add a little water to get good fluidity.
However, do not exceed 34% of water ratio (1.7 liters, or 0.45 US gallon, per 5 kgs, or 11 lb of BRISTAR)
(3)Mixing time using a hand-mixer is approximately 2-3 minutes (it is recommended that a mechanical mixer be used for large-volume jobs).
When mixing by hand, be sure to wear rubber gloves.

4. Mixing Water

(1)Use clean water such as city water, river water, sea water,which are not contaminated with oil, organic substances, etc.
(2)Use the proper temperature of water for each type of BRISTAR referring to Table 2 on page 7.
(3)In particular, cool water below 15℃ (59°F) must be used when average atmospheric temperature is more than 30℃ (86°F) for BRISTAR 100.
(4)The cooler the water is, the longer BRISTAR will remain fluid.

Filling

1. Filling of the hole with BRISTAR

(1)BRISTAR should be poured into holes within 10 minutes after mixed with water. If BRISTAR is left as it is more than 10 minutes after mixed with water, the BRISTAR gradually loses its fluidity so that it gets difficult to pour the BRISTAR into holes.
NOTE :a.Do not leave BRISTAR in a container beyond 10 minutes because blown-out shots may occur.
b.Once its fluidity is gone, it should not be diluted by re-mixing with water since the strength is greatly reduced.
(2) BRISTAR must be poured into a hole to the top.

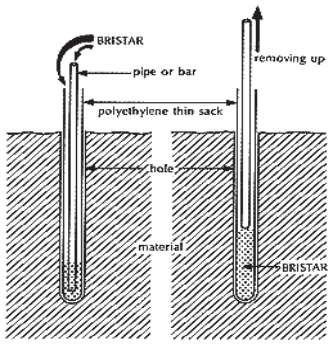


Fig. 8: Use of Polyethylene Sack in hole

2. Use of Polyethylene Sack in Hole

(1)When there are many joints or large voids in the object to be demolished and BRISTAR somewhat leaks from the hole or when there is water in the hole, place a polyethylene thin sack equal to or slightly larger than the hole diameter into the hole and then pour BRISTAR into the sack (Ref. Fig.8).
If there is water in the hole, the BRISTAR in the sack will displace the water in the hole. There is no change in the breaking effect by the use of this kind of sack.
NOTE :When a clayey layer of a rock creates a pocket in a hole during drilling, be sure to use the polyethylene sack for filling because filling of BRISTAR without the sack may cause blown-out shots.
(2)When the object to be demolished is in water, use the sack indicated in Fig.8. Try to use the bucket or the pump when filling into the pipe, remove it, and then tie the sack to prevent the BRISTAR from be diluted.
If there is no flow of water around the entrance of the hole, BRISTAR may be directly poured into the hole using a pump and so on. It should gently displace the water in the hole.
For more convenient filling work, it is recommended to use BRISTAR PACK, a cartridge type of BRISTAR (Ref. photo on page 7).
(3)When a great deal of water of the slurry is absorbed by the object to be demolished (for instance, dry concrete), use the sack or spray water into the hole before filling it with BRISTAR. In cold temperature, avoid freezing of the water sprayed into the hole.

BRISTAR

Curing

(1)Cover the filled holes with a plastic cover etc. to avoid any accident caused by blown-out shots.
(2)Tamping with mortar or sand is not required at all after the BRISTAR is poured.
It is also not necessary to put on any restrictive cap.
Just leave as it is and wait until cracks initiate.
(3)The time required for crack formation in material at 20℃(68°F) is approximately 10-20 hours. The lower the temperature is, the longer the time for crack formation is.
(4)Spraying the surface with water after cracks initiate tends to expand the width of cracks and speed up the cracking process.
NOTE :Be sure to wear PROTECTIVE GLASSES when confirming the occurrence of cracks.

Secondary Breaking

After cracks initiate, secondary breaking is carried out with a hand-breaker, a pick-hammer, a giant hydraulic breaker, a ripper, etc.
It is best to wait until the BRISTAR has worked to full depth before removing rock or concrete since premature removal at the first sign of a crack hampers the leverage effect of BRISTAR.
NOTE :a.Be sure to wear PROTECTIVE GLASSES when secondary breaking is carried out.
b.The crack width for rock or concrete continues to increase with time and can become 10-30 mm (3/8"-1 1/8") after several days, depending on free surfaces available.

● Process

Water in a container

Adding BRISTAR

Mixing

Filling

A hole filled with BRISTAR

Covering with a plastic sheet

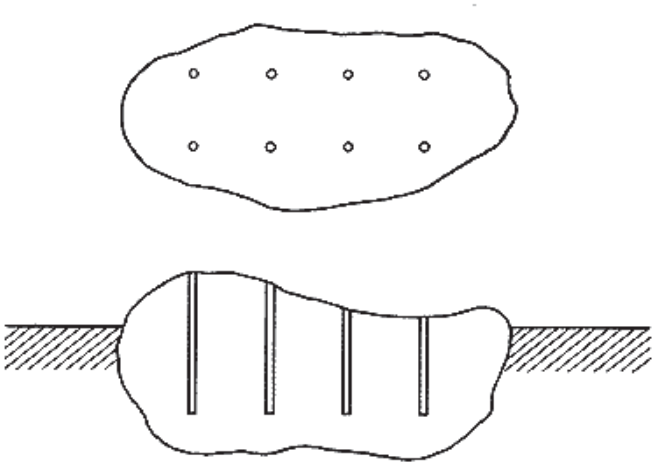
Curing

Cracks

EXAMPLE OF HOLE DESIGN FOR DEMOLITION

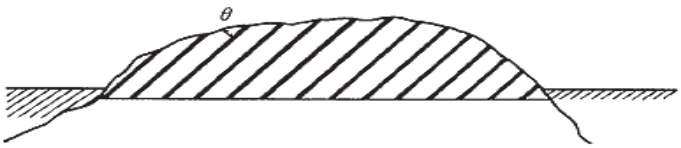
ROCK

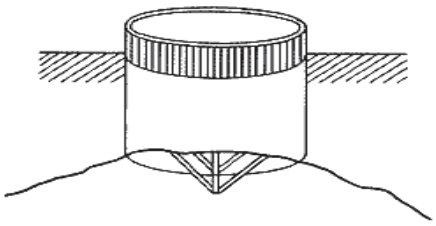
1. Boulder



d	36-50mm
	1 3/8"-2"
S	40-90cm
	1' 4"-3'
L	80% of height

2. Underground Excavation

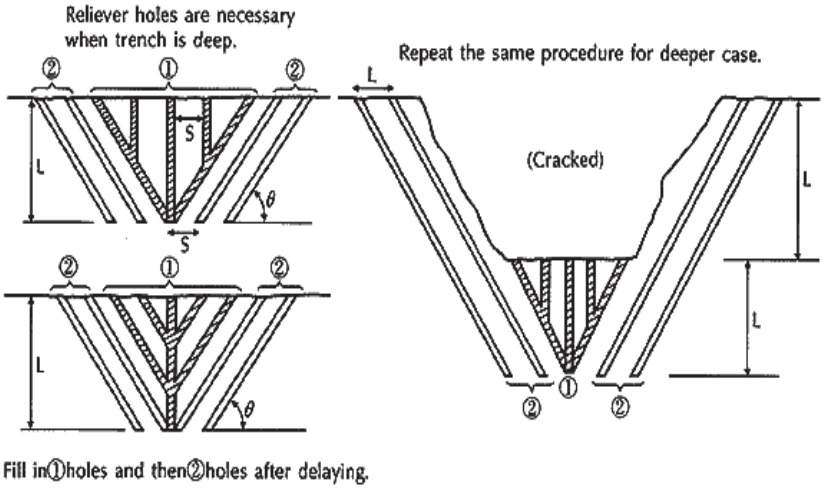




※ V-Cut Method : Refer to below.

d	40-50mm
	15/8"-2"
S	30-50cm
	1'-1' 8"
θ	parallel to free surface

3. V-cut

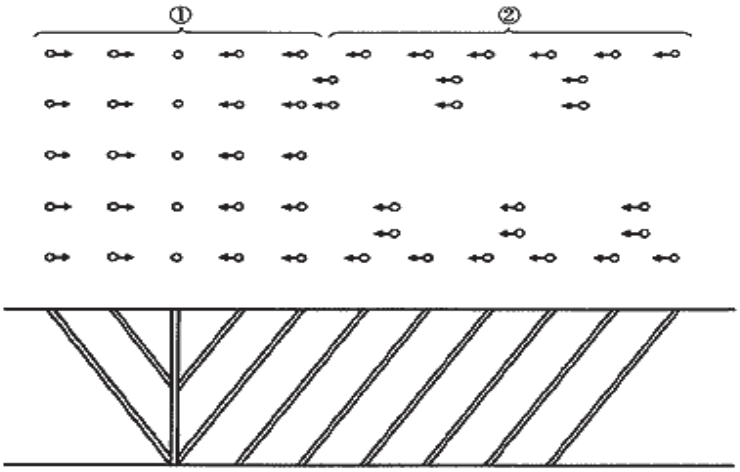


d	38-50mm
	11/2"-2"
S	30-60cm
	1'-2'
L	1-1.8m
	3'-6'
θ	45-60°

EXAMPLE OF HOLE DESIGN FOR DEMOLITION

ROCK

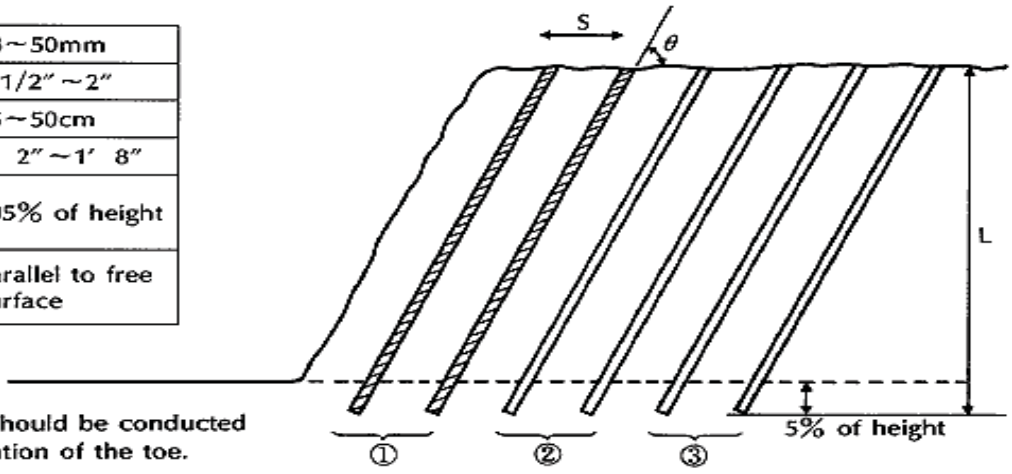
4. Trenching



d	40-50mm
	1' 5/8"-2"
S1	40-50cm
	1'4"-1' 8"
S2	20-25cm
	8"-10"
θ	45-60°

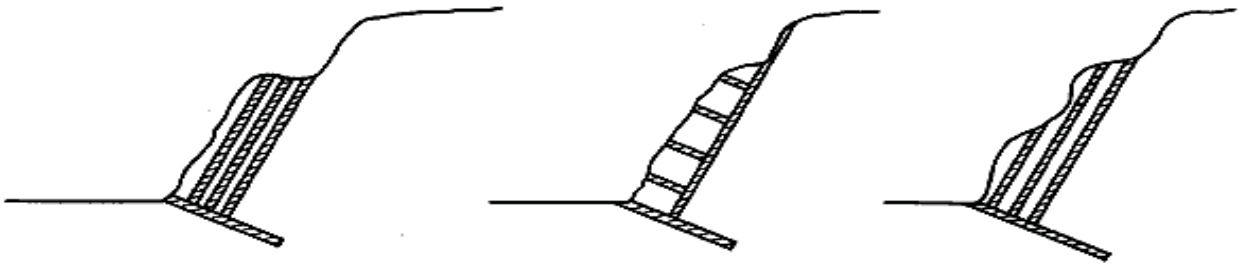
5. Bench Cut

d	38～50mm
	1 1/2″～2″
S	35～50cm
	1′ 2″～1′ 8″
L	105% of height
θ	Parallel to free surface



Bench Cut should be conducted after elimination of the toe.

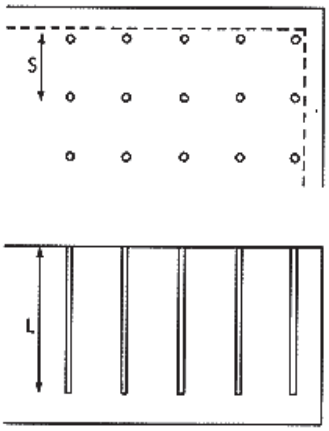
※Toe Treatment

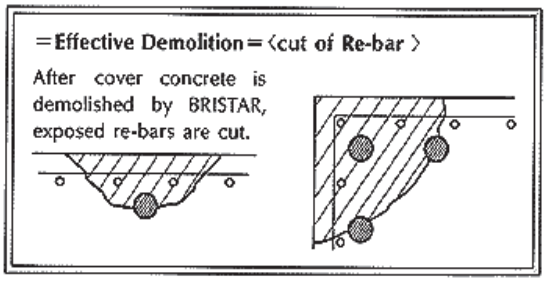


EXAMPLE OF HOLE DESIGN FOR DEMOLITION

CONCRETE

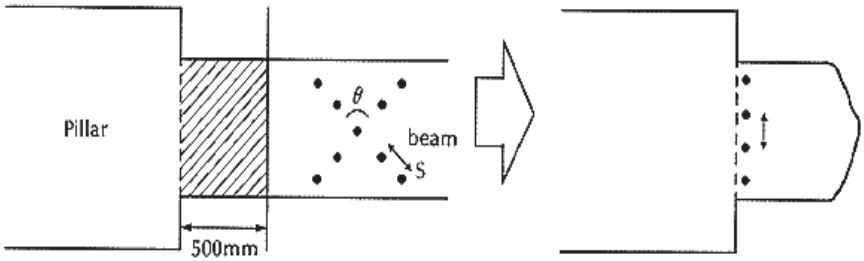
1. Reinforced Concrete





d	38-44mm
	1 1/2"-1 3/4"
S	30-60cm
	1'-2"
L	90% of height

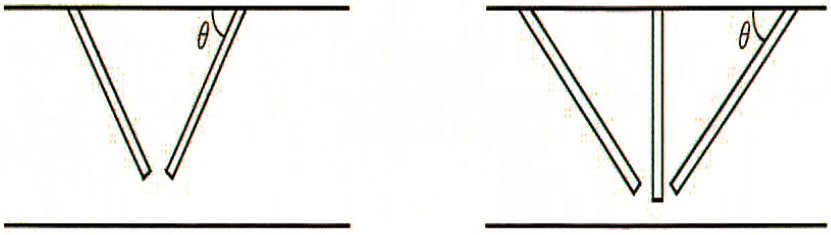
2. Zone Demolition



Set safety zone to avoid cracking at Pillar

d	38-44mm
	1 1/2"-1 3/4"
S	15-20cm
	6"-8"
L	surface90% of height
θ	90°

4. Splitting of Slab

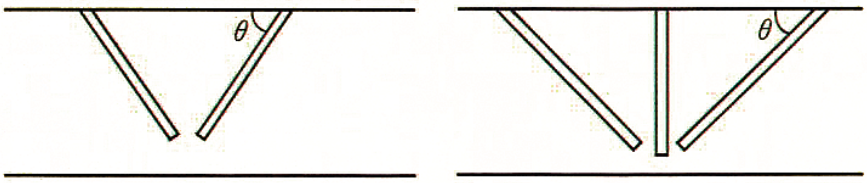


d	38-44mm
	11/2"-1 3/4"
S1	30-40cm
	1' -1' 4"
S2	15-20cm
	6"-8"
L	1-1.8m
	3'-6'
θ	90°

EXAMPLE OF HOLE DESIGN FOR DEMOLITION

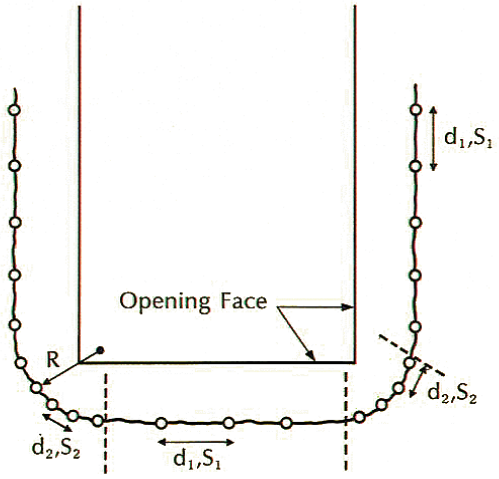
CONCRETE

4. Splitting of Slab



d	38-44mm
	1 1/2"-1 3/4"
S	30-35cm
	1'-1'2"
θ	45-60°

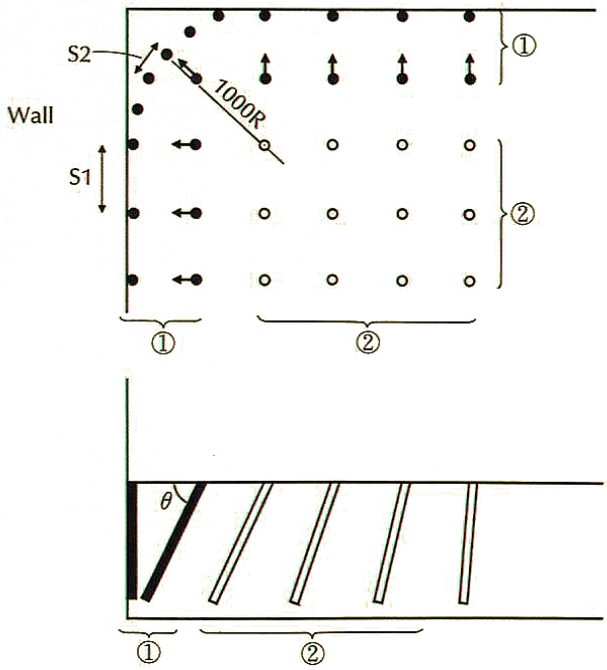
1) Avoid diagonal crack



d1	38-44mm	d2	38-44mm
	1 1/2"-1 3/4"		1 1/2"-1 3/4"
S1	30-35cm	S2	15-18cm
	1'-1' 2"		6"-7"

The curvature at corner (R) shoud be more than 15cm (6").

2) Avoid cracks to wall



d	38-44mm,
	11/2"-1 3/4"
S1	30-35cm
	1'-1' 2"
S2	15-17cm
	6"-7"
θ	45°

※First, demolition is carried out at 1 part, and then the demolition is carried out at 2 part after cracks at 1 part.

APPLICATION EXAMPLE

ROCK


Harbour Expansion


Excavation


Trenching


Demolition under Water


Bench Cut


Trenching


Trenching

APPLICATION EXAMPLE

CONCRETE


Demolition of Pier


Demolition of Concrete Foundation for machinery


Demolition of Retaining Wall


Demolition of Temporary Concrete Structure


Demolition of Retaining Wall


Demolition of Pier


Demolition of Pillar

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