

**SPADE**<sup>®</sup>



**AIR-SPADE 2000**  
**AIR EXCAVATION TOOL**

# PRODUCTS, PARTS & ACCESSORIES

	Part #	Description
	HT106	AIR-SPADE 2000 UTILITY/CONSTRUCTION KIT
	HT107	AIR-SPADE 2000 ARBORIST/LANDSCAPER KIT
	HT108	AIR-SPADE 2000 TRENCH RESCUE KIT
	HT134	AIR-SPADE 2000 60 SCFM WITH 4 FT BARREL
	HT139	AIR-SPADE 2000 105 SCFM WITH 4 FT BARREL
	HT116	AIR-SPADE 2000 150 SCFM WITH 3 FT BARREL
	HT130	AIR-SPADE 2000 150 SCFM WITH 4 FT BARREL
	HT138	AIR-SPADE 2000 225 SCFM WITH 4 FT BARREL
	HT126	25 SCFM NOZZLE
	HT125	60 SCFM NOZZLE
	HT156	105 SCFM NOZZLE
	HT123	150 SCFM NOZZLE
	HT127	225 SCFM NOZZLE
	HT119	45 DEGREE ANGLED ADAPTER
	HT131	AIR-SPADE 3 FT BARREL WITH DIRT SHIELD
	HT118	AIR-SPADE 4 FT BARREL WITH DIRT SHIELD
	HT122	AIR-SPADE 2 FT EXTENSION WITH COUPLER
	HT121	AIR-SPADE 3 FT EXTENSION WITH COUPLER
	HT154	AIR-SPADE 4 FT EXTENSION WITH COUPLER
	HT120	AIR-SPADE 5 FT EXTENSION WITH COUPLER
HT180	AUXILIARY HANDLE ASSEMBLY	
HT117	AIR-SPADE 2000 HANDLE ASSEMBLY	
HT150	AIR-SPADE 2000 HANDLE REPAIR KIT	
HT135	AIR-SPADE 2000 PRESSURE GAUGE	
HT57	10 FT x 1" 1D LIGHTWEIGHT AIR SUPPLY HOSE	
HT111	25 FT x 1" 1D LIGHTWEIGHT AIR SUPPLY HOSE	
HT112	50 FT x 1" 1D LIGHTWEIGHT AIR SUPPLY HOSE	
HT132	STORAGE CASE WITH LOCK	
HT171	STORAGE BAG, CANVAS	
HT136	FACE SHIELD & HEADGEAR	
HT161	SOIL COMPACTION TESTER	
HT174	SPRAY SHIELD, YELLOW	
SG1000	STUMP'R GUARD	

**AIR-SPADE®**

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# FREQUENTLY ASKED TECHNICAL QUESTIONS

## IN WHAT TYPE OF SOIL WILL AIR-SPADE® WORK?

Because of the focused air-jet generated from the supersonic nozzle, AIR-SPADE works in most soils, including compacted soils, and hard clays. In general, AIR-SPADE will not cut through rock. However, shales may be broken apart by AIR-SPADE if the jet is directed between the laminations of the rock. Similarly, AIR-SPADE will not dislodge hard frozen soil which tends to behave like pavement or concrete.

## WHAT SIZE AIR-SPADE NOZZLE SHOULD I USE?

This depends on the desired rate of soil excavation which is in turn dependent upon the air delivered from the AIR-SPADE nozzle. Rates are summarized in the table below:

### Soil Excavation Rates

Nozzle Size (scfm)	Soil Excavation Rates (cubic ft / min)
25	0.4 to 0.9
60	0.7 to 1.1
105	0.9 to 1.5
150	1.2 to 1.8
225	1.7 to 2.3

## WHAT SIZE AIR HOSE DO I NEED FOR THE AIR-SPADE?

Generally a 1 inch ID air supply hose is recommended for use with the AIR-SPADE.

## WILL HIGHER PRESSURE MAKE THE AIR-SPADE WORK BETTER?

All AIR-SPADE nozzles are developed to operate optimally at 90 psig. Supplying higher pressure to a supersonic nozzle that has been optimized for 90 psig actually defocuses the air jet, thus degrading performance while consuming more air. For example, doubling the air pressure to 180 psig increases the air jet force by only 10%.

## WHAT SIZE AIR COMPRESSOR DO I NEED TO USE THE AIR-SPADE PROPERLY?

Portable air compressors have model numbers that are normally sized by the approximate air delivery in standard cubic feet per minute (scfm) at a gauge delivery pressure of 100 pounds per square inch (psig). For example, a 185 compressor will deliver 185 scfm at 100 psig. All AIR-SPADE nozzles are rated at 90 psig and are designated by their air delivery at this pressure. Five nozzles are available to cover the size range of most portable air compressors. To size an AIR-SPADE nozzle to a compressor simply ensure the compressor size is larger than the nozzle size. The below table lists the minimum portable air compressor size needed to properly run a given AIR-SPADE nozzle.

### Recommended Compressor Size

Nozzle Size (scfm)	Minimum Compressor Size (scfm @ 100 psig)
25	25
60	60
105	125
150	175
225	250

## HOW SHOULD I DIG WITH THE AIR-SPADE?

Each pass of the AIR-SPADE dislodges material up to several inches deep in a medium to stiff soil. Unless the soil is highly compacted, dwelling on the same spot is unnecessary and tends to increase spray. Ideally, the AIR-SPADE should be moved laterally at a rate of about 1 to 2 feet per second. When several inches of soil have been loosened, soil should be physically removed to expose a fresh working surface for the nozzle. Vacuum suction, as provided by the AIR-VAC® vacuum unit, is an excellent way to remove loosened soil.



Always wear eye and ear protection when operating air tools and related equipment.

# THE INDUSTRY STANDARD

Today, thousands of AIR-SPADES® are in use in arboriculture, utility, construction, and industrial applications worldwide. AIR-SPADE is the tool of choice due to its fast, easy and non-destructive method of excavation.

## APPLICATIONS



### Arboriculture / Horticulture

Since its earliest trials in 1998 at Gainsborough Farms, KY, the AIR-SPADE has become the premier air tool for advanced tree care. Leading arborists worldwide have evaluated and found multiple uses for the AIR-SPADE including:

- Aeration • Locating roots for utility line installation • Radial trenching • Root collar excavation • Root damage investigation
- Locating roots for pruning • Soil compaction reduction • Vertical mulching • Transplanting / bare rooting
- Checking adequacy of root structure before pruning



### Utility / Construction

When dealing with sensitive pipes and cables that are often punctured or damaged by traditional backhoes, the AIR-SPADE offers an easy, fast, and non-damaging way to locate and excavate the area around them. In addition, AIR-SPADE can create new holes or trenches to lay pipe or cable, and can be used in many other industrial and utility applications, including:

- Utility locating and repair • Keyholing • Potholing for line location • Crack, joint, and valve box cleaning • Roadwork



### Trench Rescue

The December 2005 issue of Underground Focus Magazine reports, "Every year in the United States, trenching accidents account for more than 5,000 serious injuries and between 50 and 100 deaths." According to Lt. Dave Adler of the Addison, IL Fire Department, a leading teacher of trench rescue training and safety; "When a worker is buried in a cave-in, a critical time clock starts and AIR-SPADE can be an effective tool for their rescue."



### Environmental Remediation

Conventional excavation of hazardous materials can be slow and harmful. AIR-SPADE, used in conjunction with the AIR-VAC vacuum unit, makes environmental site remediation easy, fast and non-damaging. Capabilities include:

- Uncover buried waste containers without fear of puncture • Excavate tight places inaccessible to conventional backhoes
- Remove material in carefully controlled layers

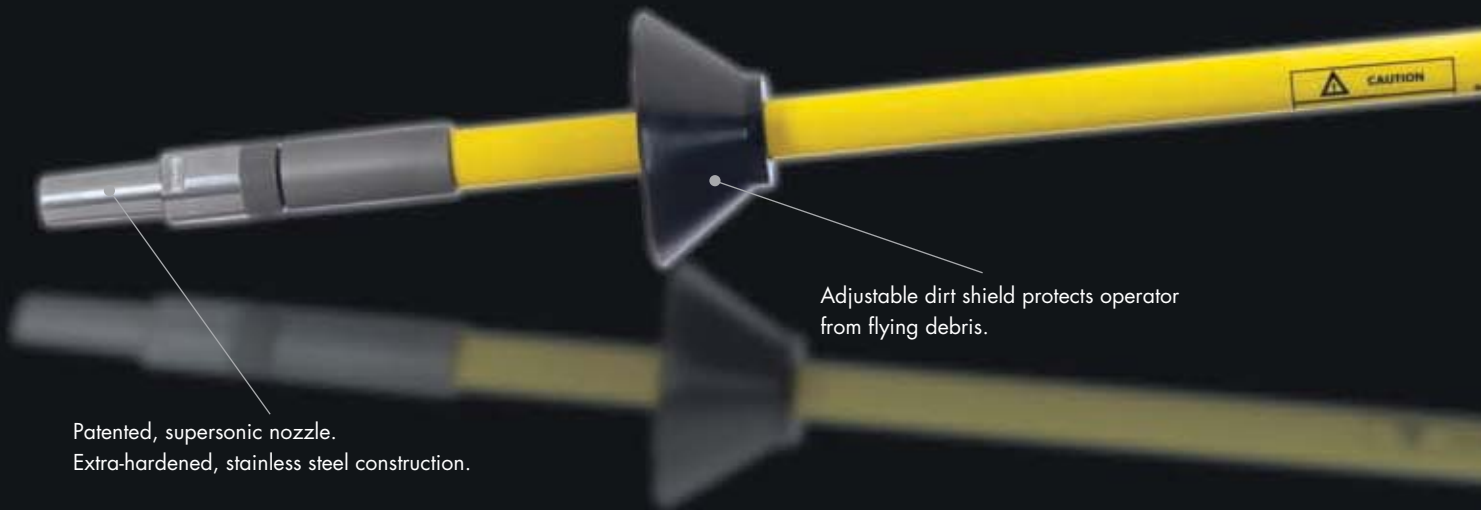


### De-Mining / Unexploded Ordnance

Sponsored by the Humanitarian De-Mining Program of the US Army at Fort Belvoir, VA, AIR-SPADE has been incorporated into proprietary systems to efficiently and safely uncover buried land mines. Extensive testing at Fort A.P. Hill, VA concluded that AIR-SPADE significantly reduced the time to find and expose hundreds of anti-personnel and anti-tank training mines over current practices.

# EXCAVATION USING THE POWER OF COMPRESSED AIR

Soil is an unconsolidated assemblage of solid particles including clay, sand, and rock and sometimes organic matter. Voids between the particles are occupied by air and/or water. When compressed air is directed into soil at close range, air enters the voids where it expands, thereby fracturing the soil. Stronger, non-porous materials such as metal or plastic pipes, cables, or even tree roots are unaffected.



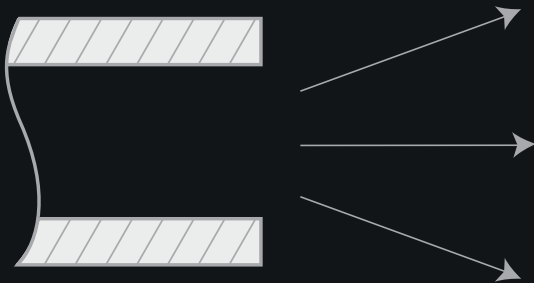
Patented, supersonic nozzle.  
Extra-hardened, stainless steel construction.

Adjustable dirt shield protects operator from flying debris.

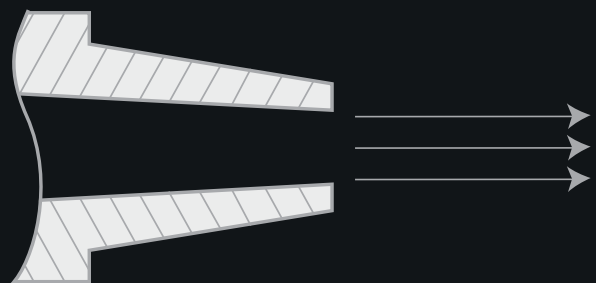
## PATENTED SUPERSONIC NOZZLE

AIR-SPADE's patented supersonic nozzle turns compressed air into a high-speed, laser-like jet moving at twice the speed of sound – Mach 2. All of the energy and momentum of air moving at approximately 1,200 mph is focused into the soil – dislodging it in a fraction of a second.

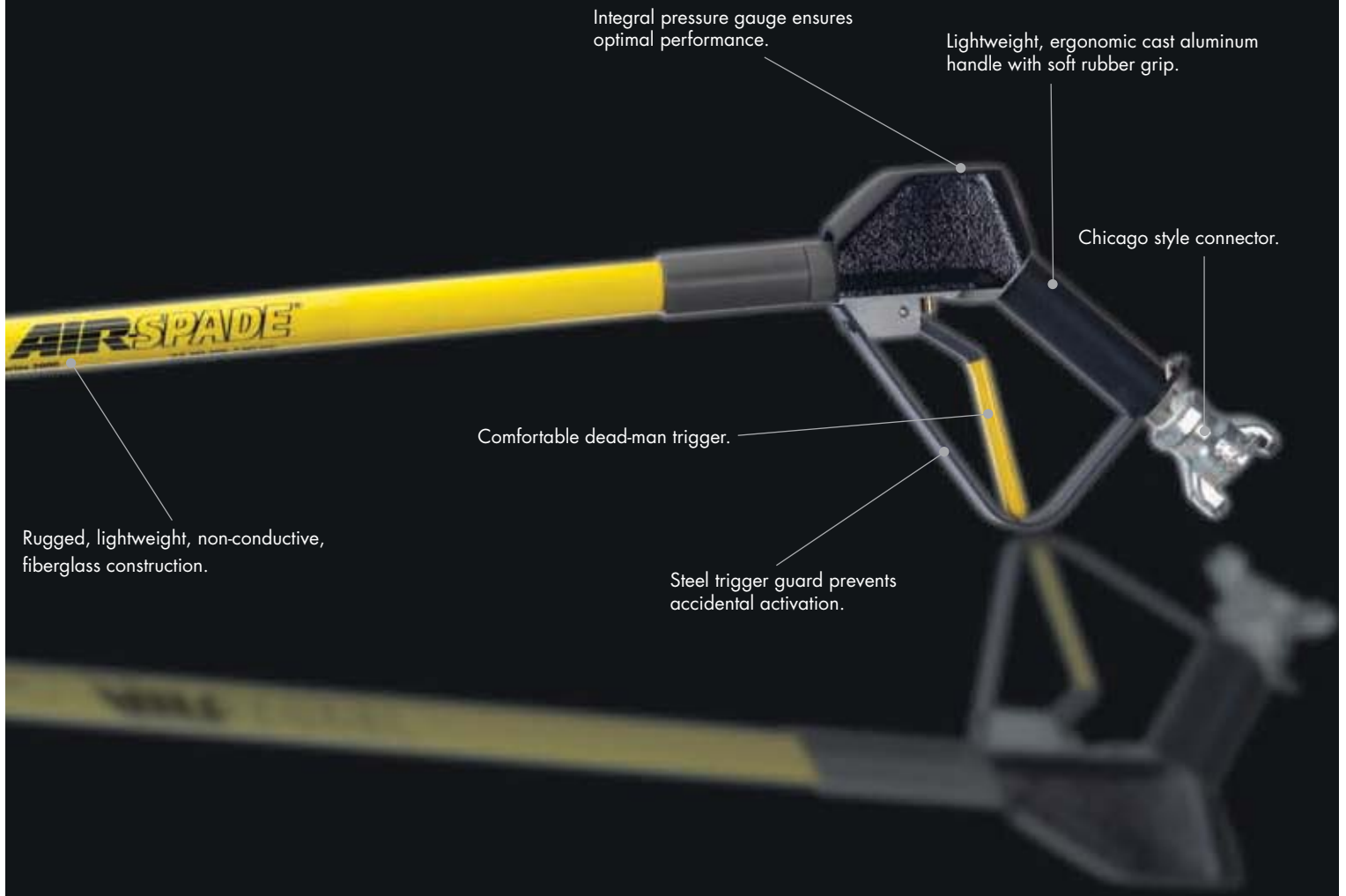
UNFOCUSED AIR FLOW FROM IMPROPERLY DESIGNED NOZZLE



FOCUSED AIR FLOW FROM AIR-SPADE SUPERSONIC NOZZLE



Air exiting from an improperly designed nozzle diffuses outward rapidly to 3 to 4 times the area versus the focused air-jet from the patented AIR-SPADE supersonic nozzle. With AIR-SPADE, the result is faster, safer, more efficient soil excavation.



Integral pressure gauge ensures optimal performance.

Lightweight, ergonomic cast aluminum handle with soft rubber grip.

Chicago style connector.

Comfortable dead-man trigger.

Steel trigger guard prevents accidental activation.

Rugged, lightweight, non-conductive, fiberglass construction.



AIR-SPADE 2000 Arborist/Landscaper Kit shown above.

**AIR-SPADE® 2000 Arborist/Landscaper Kit includes:**

- AIR-SPADE® 2000 handle with Chicago style connectors
- 4 ft barrel with dirt shield and 150 scfm nozzle
- 45 degree angled adapter
- 10 ft x 1" 1D lightweight air hose with Chicago style connectors
- Heavy duty locking storage case

**AIR-SPADE® 2000 Utility/Construction Kit includes:**

- AIR-SPADE® 2000 handle with Chicago style connectors
- 4 ft barrel with dirt shield and 150 scfm nozzle
- 3 ft extension and coupler
- 45 degree angled adapter
- 10 ft x 1" 1D lightweight air hose with Chicago style connectors
- Heavy duty locking storage case

**AIR-SPADE® 2000 Trench Rescue Kit includes:**

- AIR-SPADE® 2000 handle with Chicago style connectors
- 4 ft barrel with dirt shield and 150 scfm nozzle
- 45 degree angled adapter
- 10 ft x 1" 1D lightweight air hose with Chicago style connectors
- Additional 60 scfm nozzle
- Heavy duty locking storage case