

BLASTER'S GUIDE

A Resource for the Explosives and Blasting Industry

THE

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Austin Powder Company

25800 Science Park Drive Cleveland, Ohio, USA 44122 Phone: 216-464-2400 Fax: 216-464-4418

Email: info@austinpowder.com

Blasters Guide – Austin Powder Company

Seismic Product
Information Bulletins
2021 Seismic PIB Catalog

USED IN 1833 & EVER SINCE



Seismic PIB Catalog Index

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E★STAR Seismic Detonators

PRODUCT INFORMATION BROCHURE

E★STAR Seismic electronic detonators have been designed to provide the precise control necessary to produce the most accurate and consistent seismic record. The E★STAR Seismic detonator may be programmed in 1-millisecond increments from one (1) millisecond up to twenty (20) seconds. using the dedicated DLG 1600-100-S Logger. Unique serial number for each E★STAR Seismic detonator provides "Cradle to Grave" traceability.

ADVANTAGES

- 750 mg PETN base charge far exceeds the standard #8 strength detonator.
- Industry's most user-friendly and rugged electronic seismic detonator.
- Designed to fire pattern shots up to ten detonators simultaneously.
- Legwire HDPE insulation for added protection from current leakage. 0.8 mm diameter copper wire (#20 AWG).
- Advanced pre-fire diagnostics coupled to the communication protocol.



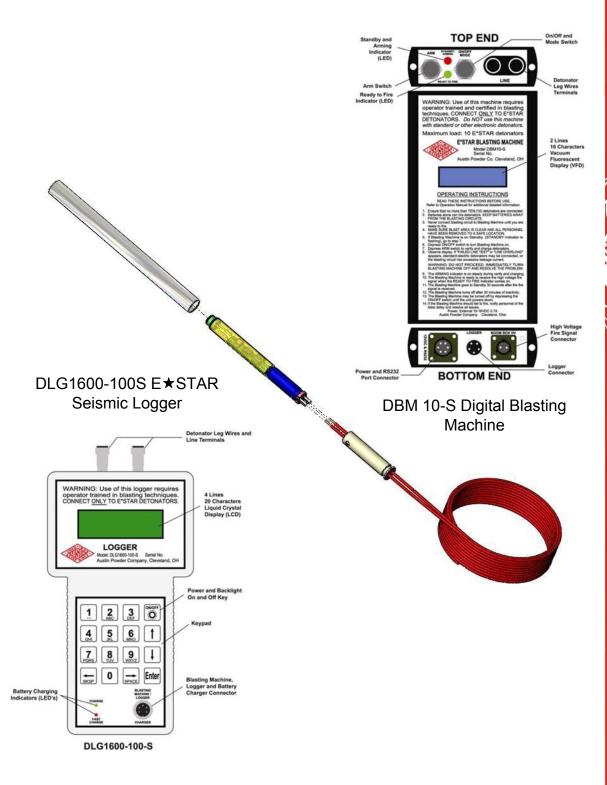
PROPERTIES

E★STAR Seismic detonators contain a capacitor, a logic and timing circuit, and pyrotechnic ignition system manufactured by Austin Powder to provide a complete unit. When the capacitor is charged by the DBM 10-S Digital Blasting Machine, the internal capacitor provides the energy that initiates the "bridge wire" and subsequently detonates the base charge.



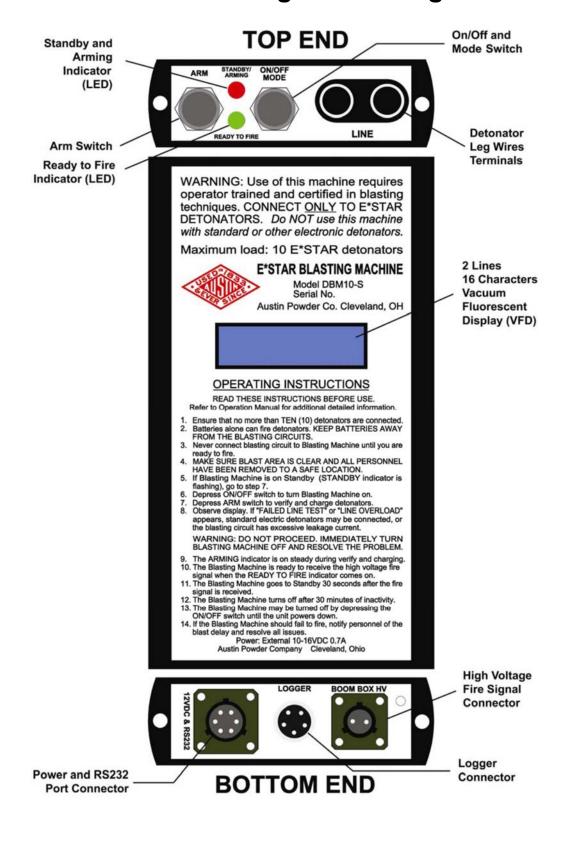


E★STAR Seismic Detonators





E★STAR DBM 10-S Digital Blasting Machine

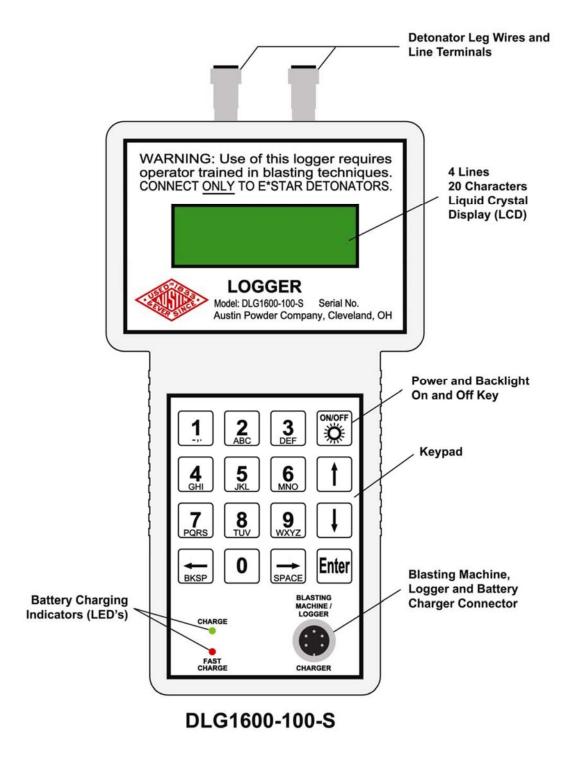




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E★STAR DLG 1600-100-S Seismic Logger







E★STAR Seismic Detonators

REQUIRED EQUIPMENT

The use of this system requires specific training in all components. This training is in addition to the normal, required training that all blasters and blasting personnel have received.

Only equipment specifically designed for use with Austin Powder E★STAR Seismic detonators is permitted. The currently approved equipment is a DLG 1600-100-S logger and a DBM 10-S Digital Blasting Machine* manufactured by Dan-Mar Co., Inc. An "operators" manual is to be available at all times when using this equipment.

*Warning: The DBM 10-S Digital Blasting Machine is designed for use only with E★STAR Seismic detonators. **Do Not** attempt to use this blasting machine with any other detonator. The misuse of this blasting machine with standard electric detonators may result in instantaneous detonator initiation.

STANDARD PACKAGING DETAILS

	E★STAR Seismic Detonator Packaging								
Ler	Length Case Wt		e Wt	Case Count	Wire				
[ft]	[m]	[lb]	[kg]	Case Count	Configuration				
25	7.6	21.52	9.77	70	Fast 8				
35	10.7	24.76	11.24	60	Fast 8				
45	13.7	26.03	11.82	50	Fast 8				
55	16.8	25.34	11.51	40	Fast 8				
65	19.8	34.12	15.49	45	Spooled				
85	25.9	42.94	19.50	45	Spooled				
100	30.5	49.56	22.50	45	Spooled				
120	36.6	27.91	12.67	20	Spooled				
140	42.7	31.83	14.45	20	Spooled				
160	18.8	35.75	16.23	20	Spooled				
180	54.9	39.67	18.01	20	Spooled				
200	61.0	43.59	19.79	20	Spooled				
220	67.1	47.51	21.57	15	Spooled				
240	73.2	51.43	23.35	15	Spooled				

STANDARD TECHNICAL DESCRIPTION

Electronic programmable detonators

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

For optimum accuracy, use within five years from date of manufacture under good storage conditions.

TRANSPORTATION DATA **UN CLASSIFICATION**

Shipping Name: Detonators, Electric

Class & Division: 1.4B ID Number: UN 0255

US DOT REFERENCE NUMBER

EX-0103067

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Enviroprime®

PRODUCT INFORMATION BROCHURE

Enviroprime offers the highest velocity of any commercially available explosive. The explosive contains a microbial innoculant that effectively bioremediates TNT, PETN, RDX and HMX explosives. When submerged in water for over one year, the microorganisms become active and begin to consume the explosive material.

ADVANTAGES

- High detonation velocity produces excellent seismic pulse images.
- Anaerobic bacteria are provided in a time release form, so that they are activated only after at least one year in the subsurface environment.
- Microbial nutrients are added to provide sufficient reducing power to degrade the unexploded charge if needed, yet not interfere with the explosive energy.



PROPERTIES

Density	Pressure	Water	iter VOD		
[g/cc]	[kb]	Resistance	[ft/s]	[m/s]	
1.6	240	Excellent	27,000	8,300	

PRIMING

Use a high-strength detonator (Static★Star®, E★Star® Seismic or equivalent).





Enviroprime

STANDARD PACKAGING DETAILS

Cartridge	Cartridge	Cartridge Size*			
Style	[in]	[mm]	Case Count	Weight	
Plastic Threaded Cartridges	2 ¼ x 1 lb	*	50	52 lb	
Plastic Threaded Cartridges	2 1/4 x 2 1/2 lb	*	20	52 lb	
Plastic Threaded Cartridges	2 1/4 x 5 1/2 lb	*	10	57 lb	
Plastic Threaded Cartridges	*	60 x ½ kg	40	21.5 kg	
Plastic Threaded Cartridges	*	60 x 1 kg	20	21.5 kg	
Plastic Threaded Cartridges	*	60 x 2 kg	10	21.5 kg	

^{*} Available in other sizes upon request.



Cast explosive, bioremedian technology

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

Indefinite from date of manufacture under good storage conditions.

TRANSPORTATION DATA

UN CLASSIFICATION

Shipping Name: Boosters Class & Division: 1.1D ID Number: UN 0242

US DOT REFERENCE NUMBER

EX-1993030285

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Enviroseis®

PRODUCT INFORMATION BROCHURE

Enviroseis is a detonator sensitive, high viscosity explosive packaged in paper shells or rigid plastic cartridges.

ADVANTAGES

- High detonation velocity produces excellent seismic pulse images.
- Does not contain molecular explosives, nitroglycerin or perchlorates.
- Predominate detonation by-products are water vapor, carbon dioxide and nitrogen.
- Desensitizes and decomposes in shorter time period as compared to conventional seismic explosives.



PROPERTIES

Density	Temperature	Pressure	Water	VOD	
[g/cc]	Sensitivity	[kb]	Resistance	[ft/s]	[m/s]
1.16	-20 F / -29 C	100	Excellent	19,200	5,910

PRIMING

Use a high-strength detonator (Static★Star®, E★Star® Seismic or equivalent).





Enviroseis

STANDARD PACKAGING DETAILS

Cartridge	Cartridge Size		Cartridg	e Weight	Case	Case \	Veight
Style	[in]	[mm]	[lb]	[kg]	Count	[lb]	[kg]
Paper Tube	*	27 x ¹ / ₈ kg	.28	.13	160	44	20
Plastic Cartridge	*	51 x ¼ kg	.55	.25	80	44	20
Plastic Cartridge	*	51 x ½ kg	1.1	.50	40	44	20
Plastic Cartridge	*	51 x 1 kg	2.2	1.00	20	44	20
Plastic Cartridge	2 ¼ x 1.1 lb	*	1.1	.50	40	44	20
Plastic Cartridge	2 1/4 x 2 1/2 lb	*	2.5	1.13	20	50	22.7
Plastic Cartridge	2 1/4 x 5 lb	*	5.0	2.27	10	50	22.7
Plastic Cartridge*	*	60 x ½ kg	1.1	.50	40	44	20
Plastic Cartridge*	*	60 x 1 kg	2.2	1.00	20	44	20
Plastic Cartridge*	*	60 x 2 kg	4.4	2.00	10	44	20

^{* 60} mm Plastic Cartridge has a threaded fast lock connector.

STANDARD TECHNICAL DESCRIPTION

Detonator sensitive emulsion

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

One year from date of manufacture under good storage conditions.

TRANSPORTATION DATA

UN CLASSIFICATION

Shipping Name: Explosive, Blasting, Type E

Class & Division: 1.1D ID Number: UN 0241

US DOT REFERENCE NUMBER

EX-9305177

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Seis-Gel™

PRODUCT INFORMATION BROCHURE

Seis-Gel is a high velocity, 60% seismic explosive. The special formulation of this nitroglycerin based product assures reliable detonation after prolonged immersion under high hydrostatic pressures. Seis-Gel is characterized by high velocity and consistent performance under severe winter conditions or in hot, humid areas.

ADVANTAGES

- Detonates consistently to produce a sharp pulse of seismic energy.
- Available in plastic threaded cartridges or paper shell.
- Ideal for deep hole work and prolonged sleep time.



PROPERTIES

Density	Pressure	Water	VOD		
[g/cc]	[kb]	Resistance	[ft/s]	[m/s]	
1.5	115	Excellent	20,000	6,100	

PRIMING

Use a high-strength detonator (Static★Star, E★Star Seismic or equivalent).





Seis-Gel

PACKAGING

Cartridge	Cartridge	Size*	Case	Case
Style	[in]	[mm]	Count	Weight
Paper Shell	*	51 x ¼ kg	80	20 kg
Paper Shell	*	51 x ½ kg	40	20 kg
Paper Shell	*	51 x 1 kg	20	20 kg
Paper Shell	*	51 x 2 kg	10	20 kg
Plastic Threaded Cartridge	2 ¼ x 1 lb	*	50	50 lb
Plastic Threaded Cartridge	2 1/4 x 2 1/2 lb	*	20	50 lb
Plastic Threaded Cartridge	2 ¼ x 5 lb	*	10	50 lb
Plastic Threaded Cartridge	*	60 x ½ kg	40	20 lb
Plastic Threaded Cartridge	*	60 x 1 kg	20	20 lb
Plastic Threaded Cartridge	*	60 x 2 kg	10	20 lb



STANDARD TECHNICAL DESCRIPTION

60% high velocity seismic dynamite

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

Two years from date of manufacture under good storage conditions.

TRANSPORTATION DATA

UN CLASSIFICATION

Shipping Name: Explosive, Blasting, Type A

Class & Division: 1.1D ID Number: UN 0081

US DOT REFERENCE NUMBER

EX-1984110031

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Seismic Detonating Cord

PRODUCT INFORMATION BROCHURE

Austin Powder manufacturers a wide variety of detonating cord to meet the requirements of the seismic industry. Detonating cord is used to initiate detonator sensitive seismic explosives. Detonating cord is also used to provide a path of initiation for non-electric initiation. Detonating cord has a core of PETN (pentaerythritol tetranitrate) encased in multiple polypropylene yarns, overextruded with a polyethylene jacket and high strength textile yarns.

ADVANTAGES

- Water and abrasion resistant.
- High tensile strength.
- Color coded for easy identification.
- Electronically and mechanically inspected.
- Insensitive to extraneous current.
- Assures reliable non-electric initiation.
- Ideally suited for use with Static★Star.



STANDARD TECHNICAL DESCRIPTION

Lite Line ®: Downline under all but the most severe conditions.

A-Cord™: Small, medium and large hole downlines.

50 Reinforced [™]: Excellent general purpose detonating cord for reliable blast initiation under virtually all conditions.

100 Grain: All detonating cords are available with "FS" (Flash Suppresant outer jacket) upon request.





Seismic Detonating Cord

PROPERTIES and STANDARD PACKAGING DETAIL

Product Name	Grain Load		Outside Diameter	Tensile Strength	Case	Weight	Color	
Troudet Nume	[gr/ft]	[g/m]	[in]	[lb]	Count	[lb]	00101	
Lite Line	15	3.2	0.155 +/- 0.015	230	(2) 2000' Spools	30	Pink	
A-Cord	25	5.3	0.165 +/- 0.015	230	(2) 1000' Spools	22	Green	
50 Reinforced	50	10.6	0.197 +/- 0.015	250	(2) 1000' Spools	30	Yellow	
100 Grain	100	20.0	0.220 +/- 0.020	175	(1) 1000' Spool	57	Red	



STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

Five years from date of manufacture under good storage conditions.

TRANSPORTATION DATA

UN CLASSIFICATION

Shipping Name: Cord, Detonating

Class & Division: 1.1D ID Number: UN 0065

US DOT REFERENCE NUMBER

EX-9303282

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Seisprime™

PRODUCT INFORMATION BROCHURE

Seisprime is formulated of a composite of high density, high velocity molecular explosives. Seisprime is engineered to produce over 240 kilo bars of detonation pressure. The rigid threaded plastic Seisprime cartridge is designed to accept an anchor point or top anchor, and is provided with two detonator wells. Seisprime has the longest "sleep time" of any commercial seismic explosive. The formulation suits the requirements of mini-hole, as well as deep hole seismic exploration. Use a high-strength seismic detonator of 720mg PETN or greater for reliable initiation.

ADVANTAGES

- 24,500 fps detonation velocity produces excellent seismic pulse images.
- Formulated to achieve a higher detonation temperature and lower post detonation gas production than standard seismic pentolite, dynamites or emulsions.
- Does not contain nitroglycerine or perchlorates.
- Full function reliability in all typical geophysical hole depths/water conditions.



PROPERTIES

Velocity of Detonation (mps / fps)	Detonation Pressure* (kilo bars)	Total Gas Generation* (liters / kg)	Energy* (MJ/kg)	Density (grams/cc)	Water Resistance
7,538 / 24,500	240	619	6.33	1.73	Excellent

^{*}Detonation pressure, total gas generation and energy values are calculated using Tiger ™, a well established thermodynamic computer code. Other computer codes may give different values.





Seisprime

STANDARD PACKAGING DETAIL

Product (kg / lbs.)	Cartridge Size* (mm / in.)	Quantity per case	Case Weigh (kg / lbs.)	Case Size (cm / inches)
Seisprime (0.5 / 1.1)	57 / 2 1/4	40	21.5 / 47.4 lb	32.4 x 44.4 x 29.8 12 ³ ⁄ ₄ x 17 ¹ ⁄ ₂ x 11 ³ ⁄ ₄
Seisprime (1.0 / 2.2)	57 / 2 1/4	20	21.5 / 47.4 lb	32.4 x 44.4 x 29.8 12 ³ ⁄ ₄ x 17 ¹ ⁄ ₂ x 11 ³ ⁄ ₄
Seisprime (2.0 / 4.4)	57 / 2 1/4	10	21.5 / 47.4 lb	33 x 78.1 x 11.7 13 x 30 ¾ x 4 5⁄8
Seisprime (2.5 / 5.5)	57 / 2 1/4	10	25.9 / 57.0 lb	33 x 78.1 x 11.7 13 x 30 ¾ x 4 ¾

^{*} Available in other sizes upon request.



High-density molecular explosive

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

SHELF LIFE

Indefinite from date of manufacture under good storage conditions.

TRANSPORTATION DATA

UN CLASSIFICATION

Shipping Name: Boosters Class & Division: 1.1D ID Number: UN 0242

US DOT REFERENCE NUMBER

EX-1993030285

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Static**★**Star™

PRODUCT INFORMATION BROCHURE

The Static * Star detonator is specifically designed for the harsh conditions encountered in a modern 3-D seismic survey. The two part pressed fit sealing plug, combined with a newly designed adhesion compound, ensures protection from the environment of salt and brackish waters for extended periods of time. With the largest base charge in the industry, Static * Star electric detonators will initiate all detonator sensitive seismic explosives.



ADVANTAGES

- 900 mg PETN base charge far exceeds the standard #8 strength detonator.
- Designed for extended sleep time in salt / brackish water use.
- Consistent break time when firing with 3-10 amperes DC current.
- No fire current of 0.45 amperes for extra protection from electrostatic discharge.
- Two part sealing plug for protection from water.
- Resistant to temperature extremes from -40°F / -40°C to 150°F / 66°C.
- # 20 AWG, high abrasion resistant, Yellow HDPE insulated wire.
- Protected primary explosive charge.

STANDARD TECHNICAL DESCRIPTION

Electric seismic detonator for the geophysical industry





Static * Star

PROPERTIES and STANDARD PACKAGING DETAILS

Len	igth	Ohms Resistance (Ω)	Case Count	Case Weight		NEQ per Case (gr)	Wire Configuration
Ft	Mt			Lbs	Kg		
12	3.7	0.84	20	5.3	2.4	20	Figure 8
24	7.3	1.08	20	5.7	2.6	20	Figure 8
35	10.7	1.31	15	5.7	2.6	15	Figure 8
45	13.7	1.50	10	4.5	2.1	10	Figure 8
55	16.8	1.72	10	5.4	2.5	10	Figure 8
65	19.8	1.92	10	6.3	2.9	10	Figure 8
85	25.9	2.33	10	8.8	4.0	10	Spooled
100	30.5	2.64	10	10.2	4.6	10	Spooled
120	36.6	3.05	10	11.6	5.2	10	Spooled
140	42.7	3.46	3	5.1	11.2	3	Spooled
160	48.8	3.87	3	5.7	12.6	3	Spooled
200	61.0	4.69	3	6.8	14.9	3	Spooled

^{*}Other lengths available upon request

Electrical Data*	
No Fire Current	0.45 amps
All Fire Current	1.50 amps
Series Ignition Current	6.00 amps
No Fire Impulse	8 mJ/ohms
All Fire Impulse	16 mJ/ohms
Electrostatic Sensitivity	
Double Wire to Shell	20 kV/500 pF/100 mJ
Pin to Pin	10kV/500 pF/25mJ

^{*} Meets or exceeds the IAGC and CAGC Recommended Product Testing Methods and Specifications for Conventional Bridge-wire type Electric Seismic Detonators for Use in Seismic Operations

STORAGE

Store in accordance with all applicable local, state, provincial and federal laws.

Case Dimension:	11 ¼" x 7 5/8" x 5"
Case Diffierision.	286mmx x194mm x 127mm

SHELF LIFE

For optimum accuracy, use within five years from date of manufacture under good storage conditions.

TRANSPORTATION DATA UN CLASSIFICATION

Shipping Name: Detonators, Electric

Class & Division: 1.4B ID Number: UN 0255

US DOT REFERENCE NUMBER

EX-2014020188

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