



LYNCOLE

XIT[®] GROUNDING
A DIVISION OF VFC

PRODUCT CATALOG

**WHERE GROUNDING BONDS
WITH SCIENCE[®]**

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PRODUCT CATALOG

AN INTRODUCTION TO LYNCOLE XIT® GROUNDING

HISTORY

Lyncole XIT® Grounding was founded in 1985 with its mission being to provide the best products and services in electrical protection and grounding. We are the most experienced protection engineering firm in the industry and employ the only full-time staff of engineers. Lyncole has installed grounding systems in over 50,000 locations, 92 countries, in conditions ranging from the Arctic permafrost to the Saudi Arabian desert. We have provided customized site and facility grounding designs to virtually all industry leaders.

In 2008, Lyncole was acquired by VFC, which added an additional dimension to our capabilities. Lyncole continues as the premier engineering and grounding products company while VFC provides world class Lightning Protection design and installation services. Together, a proper grounding system, combined with the installation of a lightning protection system, will effectively protect your personnel, your facility and your equipment. *How much downtime can you afford?*

ENGINEERING SERVICES

Lyncole has the most experienced engineering staff in the industry. With over 100 years of combined engineering experience in the specialty area of grounding, we have completed thousands of grounding designs and hundreds of electrical protection surveys. Our electrical protection surveys are the industry standard and include detailed explanations with photos illustrating any problems identified. Lyncole's engineering services include:

- Site Specific Ground Designs
- Ground Potential Rise Studies
- Soil Resistivity Testing
- Site Audits/Surveys
- Installation Services
- Grounding System Testing
- Compliance Testing
- Installation Services
- Certifications



EDUCATION

Lyncole has taken its experience and created educational services that are unmatched in the industry, providing public and private classes. Our 16 hour, two-day public courses allow attendees to receive 1.8 continuing education units (CEU), 16 Building Industry Consulting Services International Credits (BICSI), 16 continuing education credits (CEC), 16 professional development hours (PDH) and 16 National Educational Telecommunications Association (NETA) continuing technical development credits (CTDC). We are an Institute of Electrical and Electronics Engineers (IEEE) education partner and approved by Electronics Technicians Association (ETA). Our courses can be tailored to fit any industry and our instructors have given private courses throughout the country and around the world.

PRODUCTS & PARTNERS

Lyncole's philosophy of total site and facility protection is supported by our ability to be an all-inclusive grounding, lightning protection, and surge suppression provider. We accomplish this by producing our XIT systems, backfill materials, bus bars and ground resistance monitors and then partnering with the best companies in the industry in their areas of expertise. We provide a full line of test instruments from AEMC® and Megger®, components for lightning protection, and general electrical work from ABB. We also provide RF surge suppression from Times Microwave Systems, AC surge suppression from DEHN, and installation and design services for lightning protection from VFC. These are all supported by the experience and engineering services in grounding, lightning protection, and surge suppression provided by Lyncole.

REPEAT CLIENT LIST

COMMUNICATIONS

AT&T Wireless
Bluegrass Cellular
Cable & Wireless
Cellular One
Continental Telephone Systems
Electric Light Wave
Florida Telephone
GST Communications
Harris Corporation
Lucent
Motorola
National Grid
New York Power Authority
Nextel
Northern Telecom, Inc.
Nynex
Onecom
Pacific Bell Mobile
Pittsburgh Cellular Telephone
Quest
Raytheon
Southern New England Telephone
Sprint
T-Mobile
360 Communications
Triton PCS, Inc.
Verizon
Voicestream Wireless
Western Telecommunications
Western Union
Western Wireless

SPECIFYING ENGINEERS

CHA
Cimetta Mining Eng. & Constructors
Clough Harbour & Associates
CMTA Engineers

Daniel Mann Johnson & Mendenhall
Dewberry - Goodkind
Edwards and Kelsey
FTC&H
Gandhi and Associates, Inc.
Holmes & Narver, Inc.
KDC Architects
Lucini, Milford & Godell
Mountain States Engineers
Pincock, Allen & Holt, Inc.
Ralph M. Parsons
Tectonic Engineering
The Chazen Companies
Turpin & Rattan

FACILITIES/INDUSTRIAL

ALCOA
Atomics International
B.C. Hydro-Electric
Bechtel Power Corporation
Beckman Instruments
Burroughs Corporation
CBS Sports
Coca Cola Technical Facility
Computer Sciences Company
Comtech Labs
ConRail
Cornell University
Digital Equipment Company
Disney
Douglas Aircraft Company
DuPont DeNemous and Company
General Dynamics
General Electric
General Motors, Fisher Body Division
Graybar Electric Company
GTE Laboratories
HBO
Hewlett-Packard



Hilton Hotels
Hughes Aircraft Company
IBM
Intel
Kaiser Steel
Lawrence Livermore Labs
Lockheed/Martin
Magma Copper Company
Marriot Hotels
Martin-Marietta Corporation
McDonnell-Douglas
Micron Computers
Monsanto
National Semi-Conductor
NBC
Northrop
Rockwell International
Sandia Laboratories
Santa Barbara Research Center
SpaceX
Spectra-Physics
Sperry Rand Corporation
Standard Power
TRW
Tyco
UCLA
University of Chicago
U.S. Steel Company
Wegmans
Westinghouse
Wilmington, DE Medical Center
WLEX - TV, Lexington, KY
WSBK - TV, Boston, MA

OIL & GAS

ARCO
BP
Chevron Oil
Exxon

Florida Power & Light
Pennsylvania Power & Light (PPL)
PG&E
RCA-Alaska Pipeline
Southern National Gas
Standard Oil
Tennessee Gas & Pipeline
Tesoro

GOVERNMENT

Bureau of Land Management
Department of Homeland Security
Federal Aviation Administration
LA Internal Services Department
NASA
NY Dept. of Transportation
U.S. Air Force
U.S. Army
U.S. Border Patrol
U.S. Coast Guard
U.S. Department of Agriculture
U.S. Department of Defense
U.S. Department of Energy
U.S. Forest Service
U.S. Marine Corps
U.S. Navy
Ventura County
Veteran's Administration

INTERNATIONAL

Elcom, Inc. (Algerian Pipeline)
ETEC
GMA-7
Inchon International Airport, Korea
ONESCO (Saudi Arabia Housing Project)
Paiton Power Project Samsung
University of Riyadh, Saudi Arabia

OVERVIEW



Lyncole continues to set the industry standard, just as we did with the originally patented, active, Lyncole XIT® Grounding System. Invented more than 40 years ago, each system we produce is maintenance free and comes with a 30-year warranty with an expected life span of more than 50 years. The complete line of all options available is discussed in further detail on pages 1-5. The Engineering Services guide, pages 20-21, will provide examples of how we can design a grounding system to meet your specific requirements and ways to implement our XIT Grounding System.

Lyncole also offers an array of products to accompany the XIT Electrolytic Grounding System such as, Lynconite II®, our proprietary backfill material, Grounding Gravel®, GRM 2000 RS, our Ground Resistance Monitoring System, and a variety of bus bars and cover boxes to fit your unique needs. This product catalog gives an in-depth look at each specific product and highlights the associated benefits. You will also learn practical applications and all options available to assist you with your project.

Along with our incomparable XIT system, Lyncole is proud to partner with Megger® and AEMC®, two of the industry's leaders in meter manufacturing. Both of these iconic companies are over 100 years old and provide the most advanced and reliable instruments manufactured today. From ground test meters, to HiPot testers, TDRs and megohmmeters, Lyncole can provide the industry best for your use.

We also work with industry leaders in surge suppression: PolyPhaser, Times Microwave, DEHN and others to provide you with the best choices.

As you can see, Lyncole provides key engineering services and education supported by our products and the products of industry leaders to provide you with the premier "One Stop Shop" for complete site protection. And this catalog is designed to guide you through the selection process.

CATALOG DIRECTORY

DESCRIPTION

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LYNCOLE XIT[®] ELECTROLYTIC GROUNDING SYSTEMS

The continuously advancing telecommunications, computer and electronics industries require the most advanced grounding systems available. Ahead of its time, the UL-listed, self-moisturizing and maintenance free XIT[®] Grounding System provides low systems to earth resistance in diverse climates around the world, without harmful effects to the environment.

The Lyncole XIT Grounding System is available in "Straight Shaft" and also "L"-Shaped models for environments that don't allow a Straight Shaft installation. The "L"-Shaped model has the same features and benefits of the Straight Shaft model. As you will see on the following pages these models are fully customizable to meet any requirements. The diagram below is an example of how to read our catalog numbers for the XIT Grounding System.

K **2** **L-2** **-** **20** **CS** **4/0** **D**
1. 2. 3. 4. 5. 6. 7. 8.

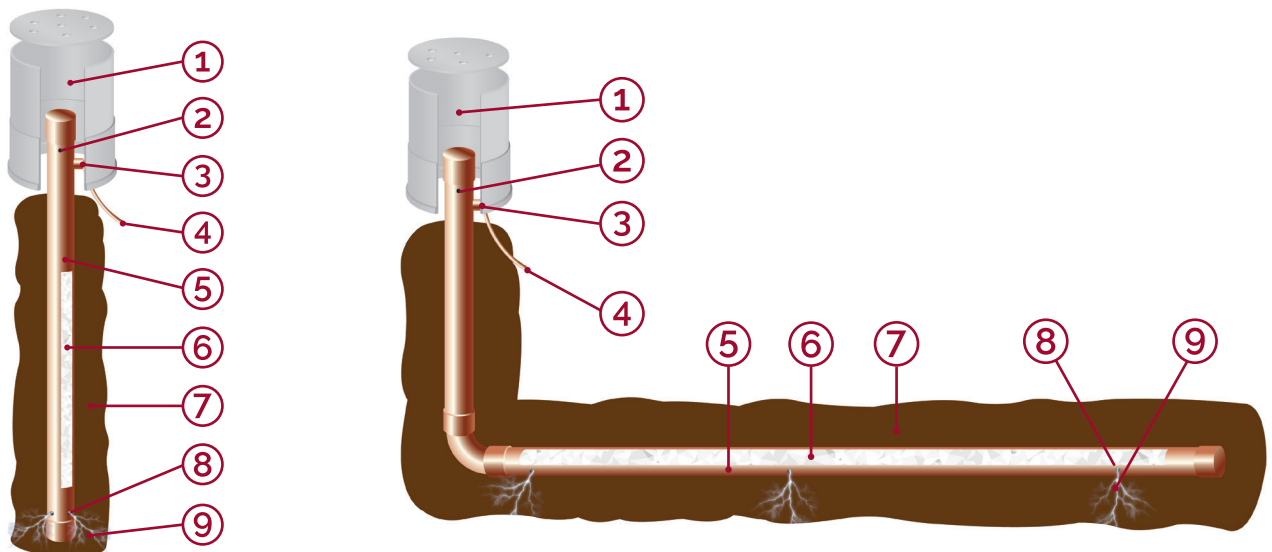
1. **MATERIAL:** Copper (K) or Stainless Steel (SS).
2. **DIAMETER:** Internal diameter of the XIT electrode in inches.
3. **ROD STYLE:** L for an L-Shaped XIT electrode. Omit for a Straight Shaft.
4. **SECTIONS:** Number of sections. Omit for a single section.*
5. **LENGTH:** Total length of the electrode in feet.
6. **SYSTEM:** Insert CS for a Complete System including a protective cover box and backfill material, omit for a XIT electrode only. The complete system is also customizable.
7. **TAIL SIZE:** Tail conductor size 4/0 AWG, 2/0 AWG, #2 AWG Stranded, #2 AWG Tinned Solid, etc. Call for additional sizes. If omitted, 4/0 with a 24" length is the default conductor.
8. **ORIENTATION:** U for an Upward Running Tail, D for Downward, and P is for a Passthrough. If omitted, Downward is the default.

* Sections come in 10 and 20 foot lengths. Custom lengths available.

30-year maintenance-free warranty, 50-year life expectancy

- Continuously UL listed since 1982
- The first and original patented electrolytic ground rod system
- Outside XIT rod diameter is 2-1/8 inches for copper and 2-3/8 inches for Stainless Steel
- The XIT rod walls are 0.083 inches thick for copper and 0.154 inches thick for stainless steel
- Active grounding system replenishes soil moisture, no watering is necessary after installation
- System performance improves over time as electrolytic roots form
- The XIT System offers stability, reducing seasonal fluctuation
- No hazardous materials or chemicals are used in producing the XIT rods
- Lynconite II® backfill material provides a pH balanced environment, inhibiting corrosion

- ① Protective Cover Box
- ② Breather Holes
- ③ Exothermic Connection
- ④ Specified Tail Conductor
- ⑤ Copper or Stainless Steel Tube
- ⑥ Non-toxic Calsolyte® Salts
- ⑦ Lynconite II® Backfill Material
- ⑧ Weep Holes
- ⑨ Electrolytic Roots



LYNCOLE XIT[®] ELECTROLYTIC GROUNDING SYSTEMS

- X = Tail Conductor Size: **4/0** AWG, **2/0** AWG, **2** (#2 AWG stranded), **2T** (#2 AWG Tinned solid)
- D / U / P = Tail Orientation (Down, Up, or Pass-through), can also accommodate multiple tails
- Standard Complete Systems include a Fibrelyte Cover Box, Lynconite II[®] backfill, and an exothermically welded tail
- Custom configurations are available, please call for details
- Maintenance Free

XIT STRAIGHT SHAFT MODELS

CATALOG NO.	BACKFILL	TEST WELL	DESCRIPTION
K2-10CSXD	1 bag LNC II	XB-12F	10' Straight Shaft Complete System
K2-20CSXD	3 bags LNC II	XB-12F	20' Straight Shaft Complete System

XIT STAINLESS STEEL STRAIGHT SHAFT MODELS

SS2-10CSXD	1 bag LNC II	XB-12F	10' Straight Shaft Complete System
SS2-20CSXD	3 bags LNC II	XB-12F	20' Straight Shaft Complete System

XIT STRAIGHT SHAFT SECTIONAL MODELS

K2-2-20CSXD	3 bags LNC II	XB-12F	20' Straight Shaft Complete System two 10' Sections
K2-4-40CSXD	6 bags LNC II	XB-12F	40' Straight Shaft Complete System four 10' Sections
K2-2-40CSXD	6 bags LNC II	XB-12F	40' Straight Shaft Complete System two 20' Sections
K2-4-80CSXD	12 bags LNC II	XB-12F	80' Straight Shaft Complete System four 20' Sections

XIT L-SHAPED MODELS

K2L-10CSXD	2 bags LNC II	XB-12F	10' Horizontal length and 36" vertical riser
K2L-2-20CSXD	3 bags LNC II	XB-12F	20' Horizontal length and 36" vertical riser

STAINLESS STEEL XIT L-SHAPED MODELS

SS2L-10CSXD	2 bags LNC II	XB-12F	10' Horizontal length and 36" vertical riser
SS2L-2-20CSXD	3 bags LNC II	XB-12F	20' Horizontal length and 36" vertical riser

- X = Tail Conductor Size: **4/0** AWG, **2/0** AWG, **2** (#2 AWG stranded), **2T** (#2 AWG Tinned solid)
- D / U / P = Tail Orientation (Down, Up, or Pass-through), can also accommodate multiple tails
- Standard Complete Systems include a Fibrelyte Cover Box, Lynconite II® backfill, and an exothermically welded tail
- Custom configurations are available, please call for details
- Maintenance Free

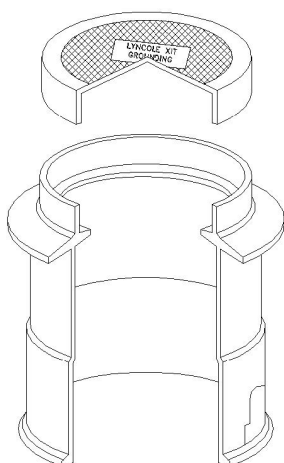
XIT STRAIGHT K2.5 **HEAVY DUTY** (35-YEAR MAINTENANCE FREE WARRANTY)

XIT STRAIGHT K3 **SUPER DUTY** (40-YEAR MAINTENANCE FREE WARRANTY)

CATALOG NO.	TEST WELL	BACKFILL	DESCRIPTION
K2.5-10CSXD	XB-12F	1 bag LNC II	10' Straight shaft model 2.5" Dia.
K2.5-20CSXD	XB-12F	1 bag LNC II	20' Straight shaft model 2.5" Dia.
K3-10CSXD	XB-12F	1 bag LNC II	10' Straight shaft model 3" Dia.
K3-2-20CSXD	XB-12F	3 bags LNC II	20' Straight shaft model, 2 sections, 3" Dia.
K3-2-40CSXD	XB-12F	6 bags LNC II	40' Straight shaft model, 2 sections, 3" Dia.

XIT **L-SHAPED** K2.5L **HEAVY DUTY** & K3L **SUPER DUTY** MODELS

K2.5L-10CSXD	XB-12F	2 bags LNC II	10' Horizontal length and 36" vertical riser, 2.5" Dia.
K2.5L-2-20CSXD	XB-12F	2 bags LNC II	20' Horizontal length and 36" vertical riser, 2.5" Dia.
K3L-10CSXD	XB-12F	2 bags LNC II	10' Horizontal length and 36" vertical riser, 3" Dia.
K3L-2-20CSXD	XB-12F	3 bags LNC II	20' Horizontal length and 36" vertical riser, 3" Dia.



LYNCOLE XIT[®] ELECTROLYTIC GROUNDING SYSTEMS

XIT DEEP WELL MODELS

CATALOG NO.	BACKFILL	TEST WELL	DESCRIPTION
K4-11DWX	None	None	Deep well, submerged applications only

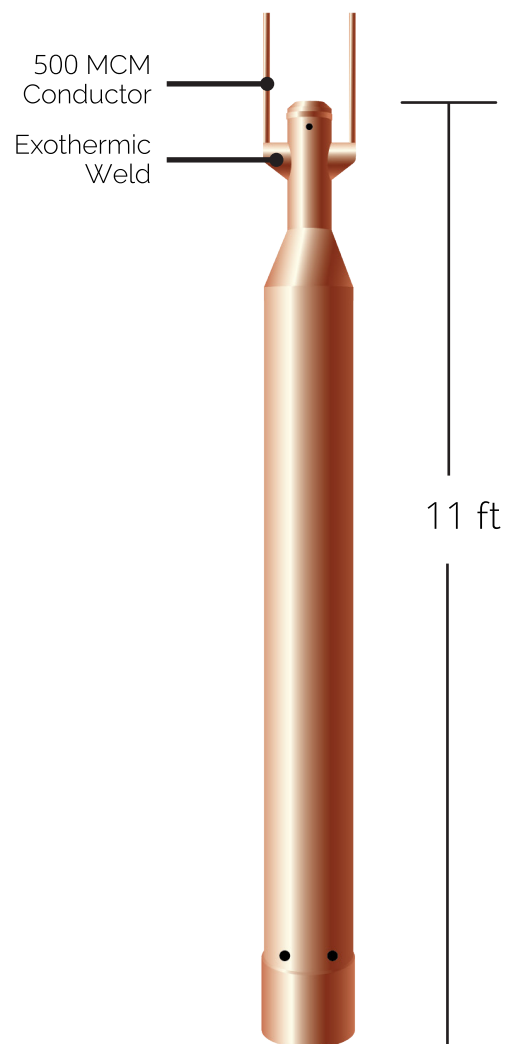
Features:

- Custom configurations are available, including conductor type and length. Please contact Lyncole for details.
- The K4 rod does not utilize Calsolyte[®]
- No hazardous materials or chemicals are used in producing the Deep Well electrodes

The K4-11DW deep well electrode length is 11 feet. The top end of the electrode is an 8.5 inch long section made of a 2 inch diameter type K copper tube that is soldered to a reducer to join the lower 10 foot section made of a 4 inch diameter type K hard tube.

The K4-11DW is permanently capped on the top and bottom. This deep well electrode is not filled with Calsolyte salts, instead it has holes, allowing the tube to fill with water.

For installation, a 6 inch diameter hole is drilled to a depth that is at least 12 feet below the water table to ensure the deep well electrode is fully submerged in water. Lower the KD-11DW deep well in the hole. Fill in the hole with soil.



LYNCOLE XIT[®] ELECTROLYTIC EARTH ENHANCEMENT PRODUCTS

Lyncole XIT[®] Grounding Systems include the XIT rod, electrolytic earth salts, a protective cover box with lid, and enough backfill material for a standard installation.

Each system is delivered with the appropriate amount of Lynconite II[®] which is the default backfill material for the following reasons:

- Lynconite II is extremely conductive, improving the performance of the grounding system.
- When Lynconite II is installed in its slurry form, it forms completely to the XIT electrode with no pockets or gaps, making an ideal connection between the grounding electrode and earth.
- Lynconite II has a nearly neutral pH. This protects the copper allowing Lyncole XIT Grounding to provide a 30 year warranty on the system.

Grounding Gravel[®], a pelletized form of backfill material is also available. It can be used as an alternative to mixing Lynconite II on site. Rather than mixing with water prior to installation, the pellets are poured in the hole or trench and then covered with water. Grounding Gravel can easily be installed in standing water. One 50 lb. bag of Grounding Gravel fills a smaller cubic area than one 50 lb. bag of Lynconite II, for this reason additional bags may be required.



LYNCONITE II®

THE IDEAL BACKFILL MATERIAL

CATALOG NO.	WEIGHT	CUBIC FEET PER BAG
LNC II	50 lb.	2.27

Lynconite II® is based on a natural earth clay. Special processing increases its electrical conductivity properties. With a resistivity of 0.6 ohms-meter it is extremely beneficial for earth grounding applications.

When mixed with water (approximately 13 gallons per 50 lb. bag) it has a relatively low viscosity for approximately 45 minutes before it takes on gel like properties. It is poured into the hole before it gels, then it adheres to the electrode and conforms to the holes dimensions, filling all voids, cracks and crevices, providing the best possible bond with the surrounding earth.

Lynconite II is environmentally safe, meeting NSF Standard 60 requirements.

Unlike carbon-based enhancement materials, Lynconite II does not place the grounding system in a corrosive environment. Lynconite II has a near neutral pH promoting a longer life span for any grounding system. You can use Lynconite II to extend the life of all electrodes and conductors, and it comes standard as part of the Lyncole XIT Grounding System. Because of the Lynconite II we are able to warranty the XIT electrode for 30 years and we expect it to have a life expectancy of greater than years!

Benefits:

- Provides The Best Electrical Bond With Earth
- Environmentally Safe
- Very Electrically Conductive
- Protective Of Copper
- Lowers Grounding System Resistance



BACKFILL SOIL

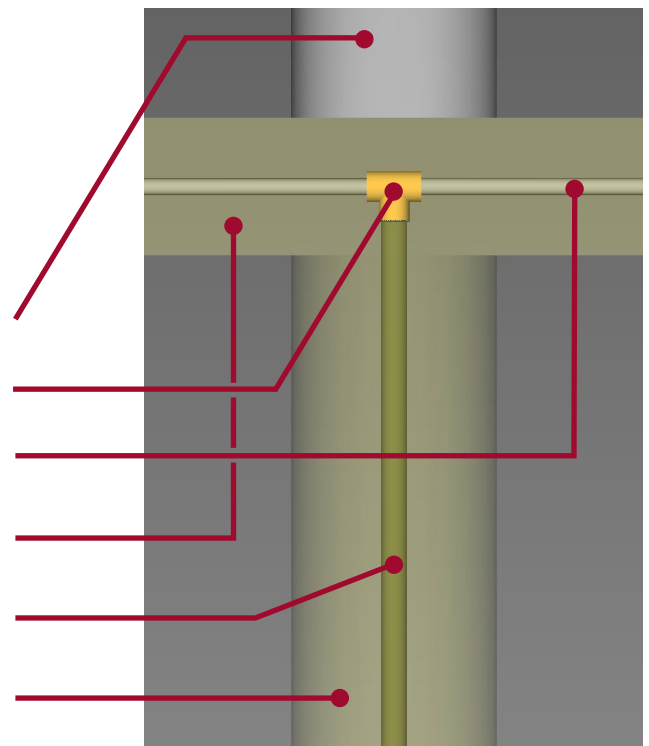
EXOTHERMIC WELD

GROUNDING CONDUCTOR

LYNCONITE II ENCASING THE BARE CONDUCTOR

GROUNDING ELECTRODE

LYNCONITE II ENCASING THE ELECTRODE



LYNCOLE GROUNDING GRAVEL®

THE "QUICK" ALTERNATIVE

CATALOG NO.	WEIGHT	CUBIC FEET PER BAG
G-Gravel	50 lb.	1

Lyncole Grounding Gravel is a pelletized form of clay based backfill and is particularly beneficial for installations involving standing water. Grounding Gravel is based on a natural earth clay formed by volcanic action.

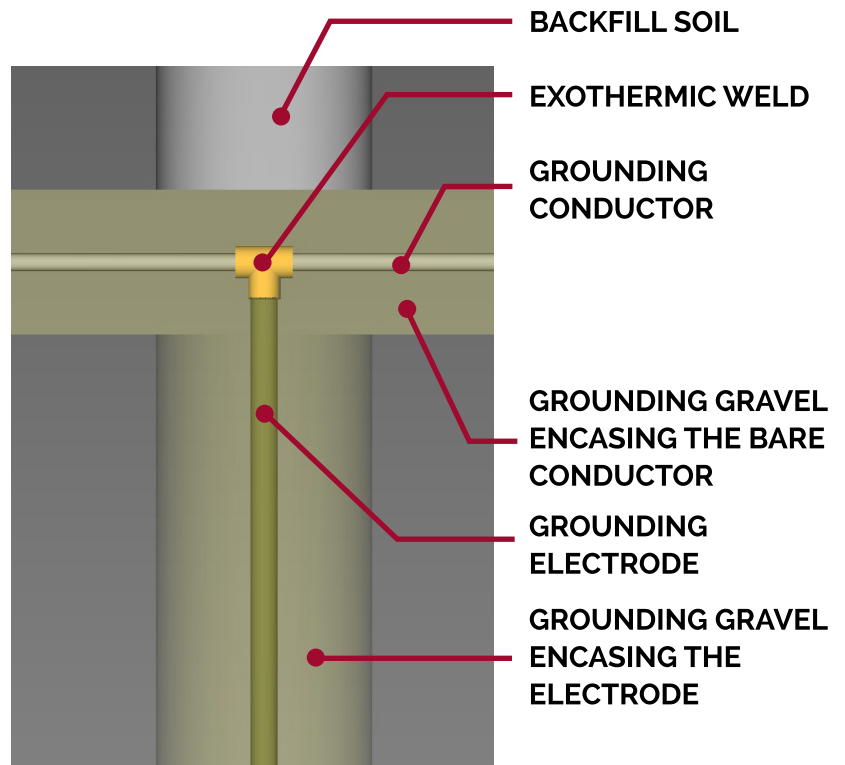
Although used in many different applications, it is extremely beneficial for earth grounding applications. Grounding Gravel is also environmentally safe, having met the NSF Standard 60 requirement for long term contact with drinking water. Grounding Gravel has all the qualities of an excellent backfill material for grounding electrodes and conductors.

Grounding Gravel is highly conductive which improves the grounding system performance. Its nearly neutral pH also promotes a long life of grounding electrodes and/or grids by protecting them from surrounding soil which may be very corrosive. This is one of the factors that allow Lyncole's XIT grounding systems to be warranted for 30 years with a life expectancy of 50 years.

Installation: Grounding Gravel does not need to be mixed into a slurry, instead half the bag is poured into the hole followed by 2-3 gallons of water. After 5 minutes the water is absorbed and the process is repeated. To install in standing water, use an inverted traffic cone or a funnel with a 2' outlet.

Benefits of Lyncole Grounding Gravel:

- Easily Installed
- Provides Good Electrical Bond With Earth
- Very Electrically Conductive
- Very Protective Of Copper
- Lowers Grounding System Resistance
- Environmentally Safe



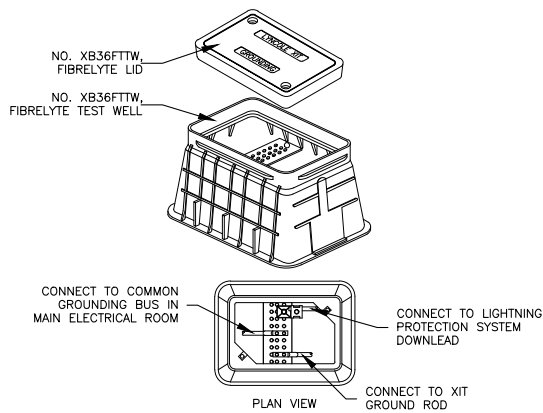
LYNCOLE XIT[®] ELECTROLYTIC GROUNDING SYSTEMS

RECTANGULAR COVER BOXES

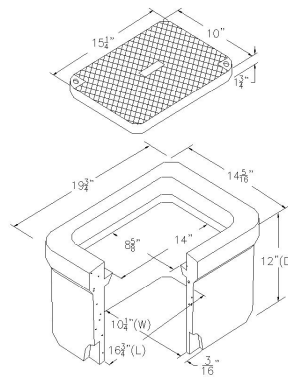
CATALOG NO.	WEIGHT WITH LID	MATERIAL	LIVE LOAD RATING	DESCRIPTION
XB-36C	98 lb.	Concrete	16,000 PSF	16 3/4" (L), 10 1/4" (W) and 12" (D). H-10 Traffic Rated
XB-36F	21 lb.	FibrelYTE	16,000 PSF	14" (L), 8 3/4" (W) and 12" (D), it comes with a vented cover labeled "Lyncole XIT Grounding", that bolts down for added security. H-10 Traffic Rated

XB-36FTTW 31 lb. FibrelYTE 16,000 PSF 14" (L), 8 3/4" (W) and 12" (D)

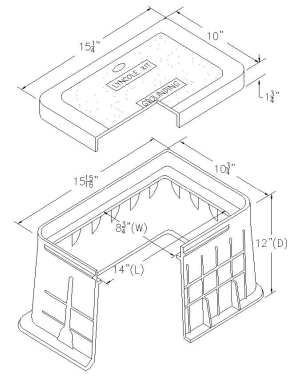
True Test Well is a one of a kind, US manufactured, test well with integrated UL Listed bus bar. It allows for a complete disconnection between the electrical service and your grounding system to allow for actual systems to ground resistance testing.



XB-36FTTW
True Test Well



XB-36C



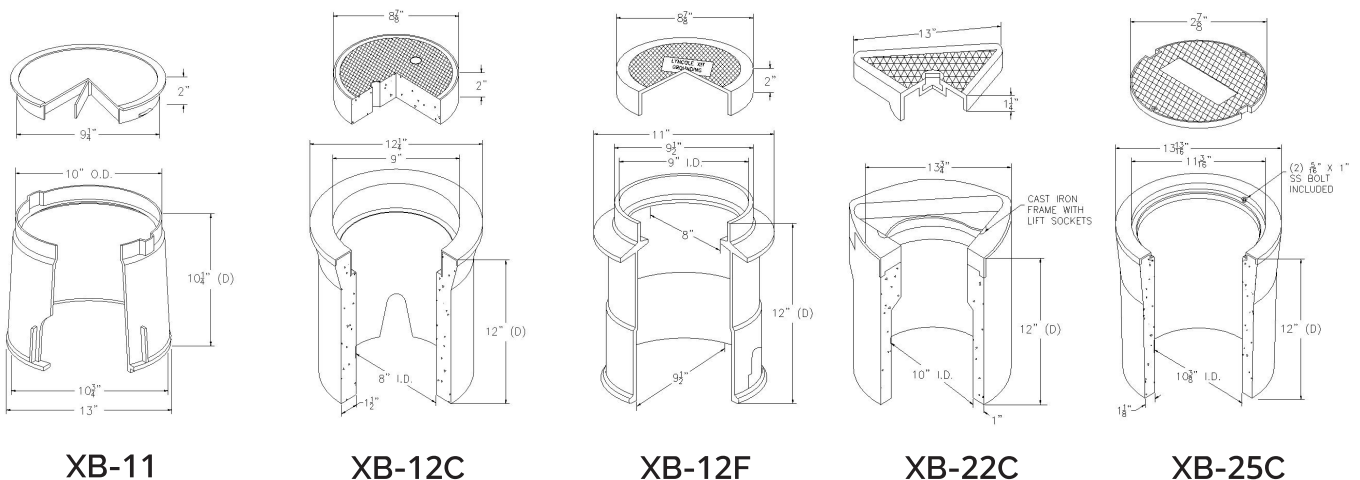
XB-36F

Notes:

- FibrelYTE is a proven polyester pre-mix with calcium carbonate and polyester resins interlaced with fiberglass and ultraviolet inhibitors
- FibrelYTE is durable and made from noncombustible materials
- FibrelYTE is stronger than pre-cast concrete and it exceeds WUC 3.6 recommendations for 10,000 LBS wheel loading
- Flexible Strength: 6,000 PSI, Tensile Strength: 6,000 PSI, Compressive Strength: 20,000 PSI

COVER BOXES

CATALOG NO.	WEIGHT WITH LID	MATERIAL	LIVE LOAD RATING	DESCRIPTION
XB-11	5 lb.	Polyplastic	350 PSF	10" (O.D.) x 10 1/4" (D), used for indoor or light traffic locations. Pedestrians
XB-12C	50 lb.	Concrete	8,000 PSF	8" (I.D.) x 12 1/4" (O.D.) x 12" (D) with cast iron lid labeled "Ground". H-10 Traffic Rated
XB-12F	9 lb.	Fibrelyte	8,000 PSF	9" (I.D.) x 11" (O.D.) x 12" (D), available in gray. H-10 Traffic Rated
XB-22C	67 lb.	Concrete	16,000 PSF	10" (I.D.) x 13 3/4" (O.D.) x 12" (D). Triangular concrete body, cast iron lid. H-20 Traffic Rated
XB-25C	61 lb.	Concrete	16,000 PSF	11 3/16" (I.D.) x 13 13/16" (O.D.) x 12" (D). Round concrete body, cast iron lid. H-20 Traffic Rated



LYNCOLE XIT[®] GROUNDING BARS

C PATTERN

PART NUMBER	PART DIMENSIONS	NUMBER OF HOLES	APPROX. WEIGHT (LBS)
LGB-12C	1/4" x 4" x 12"	15	5
LGB-24C	1/4" x 4" x 24"	33	8
LGB-36C	1/4" x 4" x 36"	51	11
LGB-48C	1/4" x 4" x 48"	66	14

- Mounting brackets and insulators included
- Manufactured from electrolytic tough pitch copper
- Holes are sized for 3/8" bolts and arranged in linear, three-row columns
- NEMA hole spacing accommodates 2-hole lugs with 3/4", 1", or 1-3/4" hole spacing

*Contact us for bus bars with specifications such as: Tinned Copper, 1" & 2" widths for limited space applications, custom hole patterns and hole sizes, length not listed above, or exothermically welded tails

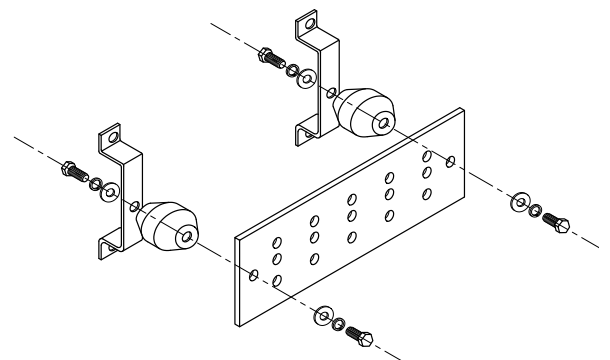
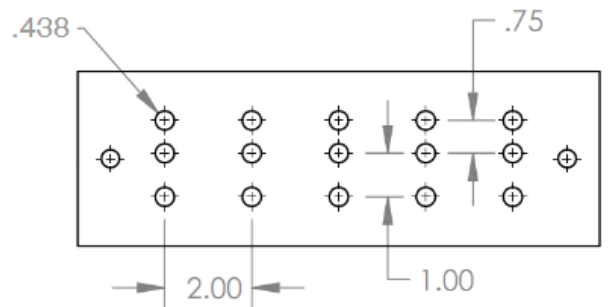
Standard Lyncole XIT copper bus bar specifications are 4" x 1/4" and include mounting brackets and insulators.

Standard hole configuration consists of:

7/16" diameter holes in linear, three row columns.

Please Call as Specialty Bus Bars are Available in:

- Tinned Copper
- 1" and 2" widths for limited space applications
- Customized hole patterns and sizes
- Lengths in excess of 10 ft.
- Exothermically welded tails

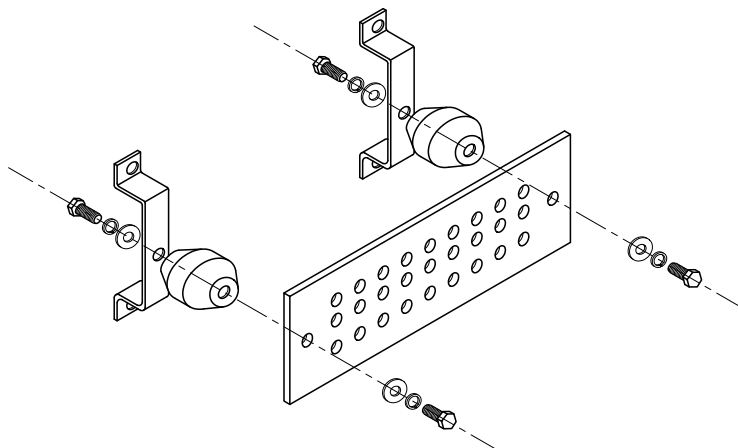
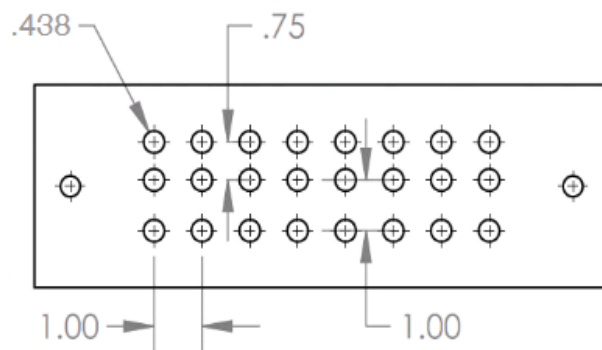


J PATTERN

PART NUMBER	PART DIMENSIONS	NUMBER OF HOLES	APPROX. WEIGHT (LBS)
LGB-12J	1/4" x 4" x 12"	27	5
LGB-24J	1/4" x 4" x 24"	63	8
LGB-36J	1/4" x 4" x 36"	99	11
LGB-48J	1/4"x4"x48"	132	14

- Mounting brackets and insulators included
- Manufactured from electrolytic tough pitch copper
- Holes are sized for 3/8" bolts and arranged in line ar, three-row columns
- NEMA hole spacing accommodates 2-hole lugs with 3/4", 1", or 1-3/4" hole spacing

*Contact us for bus bars with specifications such as: Tinned Copper, 1" & 2" widths for limited space applications, custom hole patterns and hole sizes, length snotlisted above, or exothermically welded tails



EXOTHERMIC WELDING

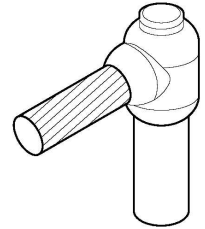
CABLE TO GROUND ROD CONNECTIONS

CR1 MOLD

CABLE TO GROUND ROD

Single cable to top of ground rod.

Connections are for concentric strand copper cable unless otherwise noted. For copper clad, galvanized, stainless clad or stainless steel ground rods.

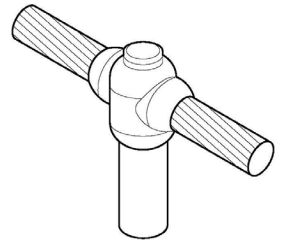


CR2 MOLD

THROUGH CABLE TO GROUND ROD

Through cable to top of ground rod.

Connections are for concentric strand copper cable unless otherwise noted. For copper clad, galvanized, stainless clad or stainless steel ground rods.



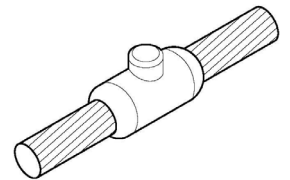
CABLE TO CABLE CONNECTIONS

CC1 MOLD

HORIZONTAL X CONNECTIONS

End to end splice of same cables.

Concentric stranded copper cable unless otherwise noted.

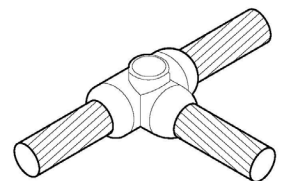


CC2 MOLD

HORIZONTAL TEE CONNECTIONS

Tee of horizontal run and tap cables.

Concentric stranded copper cable unless otherwise noted. Solid conductor can be either copper or Copperweld.



CABLE TO VERTICAL STEEL CONNECTIONS

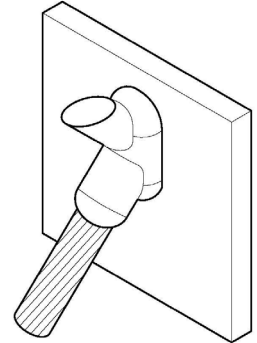
CS3 MOLD

VERTICAL STEEL SURFACE

Connection of vertical cable to vertical flat steel surface or to side of vertical or horizontal steel pipe.

A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.

Concentric stranded copper cable listed.



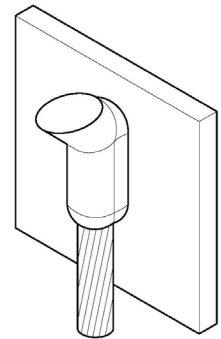
CS23 MOLD

VERTICAL STEEL SURFACE

Connection of vertical cable to vertical flat steel surface or to side of vertical or horizontal steel pipe.

A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.

Concentric stranded copper cable listed.



WELD POWDERS

Blackburn® Weld Powder

Blackburn® weld powders are contained in plastic cartridges, and are packed in plastic boxes of 10 or 20, depending on their size. Different joints require different powder sizes, and the size relates to the powder's nominal weight in grams. The weld powder packaging also contains retaining discs and starting powder. The retaining discs are contained in a separate bag within the box. Each weld uses one disc. The starting powder is compacted into the bottom of the cartridge, underneath the weld powder, and is released by tapping the cartridge base firmly. Blackburn® weld powders are suitable for making connections from copper to copper and from copper to steel.

LYNCOLE XIT[®] EXOTHERMIC WELDING

Cable to cable CC1 & CC2

CABLE TO CABLE CC1 – FURSEWELD

LIGHTNING PROTECTION CABLE

Wire Size A	Powder Cartridge	Part No. Mold	Handle Clamp	Box Quantity
28 Ropelay	65BKB	CC1-4-28	HCPK4	1
29 Smooth	65BKB	CC1-4-29	HCPK4	1
32 Smooth	45BKB	CC1-4-32	HCPK4	1

GROUNDING CABLE

4/0	90BKB	CC1-4-4/0	HCPK4	1
250	115BKB	CC1-4-250K	HCPK4	1

Molds for other cable sizes and configurations can be manufactured on request. Special designs for all FurseWELD exothermic welding molds available on request.

CABLE TO CABLE CC2 – FURSEWELD

LIGHTNING PROTECTION CABLE

Wire Size A	Wire Size B	Powder Cartridge	Part No. Mold	Handle Clamp	Box Quantity
28 Ropelay	28 Ropelay	90BKB	CC2-4-2828	HCPK4	1
29 Smooth	29 Smooth	90BKB	CC2-4-2929	HCPK4	1
32 Smooth	32 Smooth	90BKB	CC2-4-3232	HCPK4	1
29 Smooth	32 Smooth	90BKB	CC2-4-2932	HCPK4	1
32 Smooth	29 Smooth	90BKB	CC2-4-3229	HCPK4	1

GROUNDING CABLE

4/0	4/0	150BKB	CC2-4-4/04/0	HCPK4	1
250	250	150BKB	CC2-4-250K250K	HCPK4	1
250	4/0	150BKB	CC2-4-250K4/0	HCPK4	1
4/0	250	150BKB	CC2-4-4/0250K	HCPK4	1

Molds for other cable sizes and configurations can be manufactured on request. Special designs for all FurseWELD exothermic welding molds available on request.

LYNCOLE XIT[®] EXOTHERMIC WELDING

Cable to ground rod CR1 & CR2

CABLE TO GROUND ROD CR1 – FURSEWELD

LIGHTNING PROTECTION CABLE

Ground Rod A Ø (")	Wire Size B	Powder Cartridge	Part No. Mold	Handle Clamp	Box Quantity
1/2	28 Ropelay	90BKB	CR1-4-500L28	HCPK4	1
1/2	29 Smooth	65BKB	CR1-4-500L29	HCPK4	1
1/2	32 Smooth	90BKB	CR1-4-500L32	HCPK4	1
5/8	28 Ropelay	90BKB	CR1-4-62528	HCPK4	1
5/8	29 Smooth	90BKB	CR1-4-62529	HCPK4	1
5/8	32 Smooth	90BKB	CR1-4-62532	HCPK4	1
3/4	28 Ropelay	90BKB	CR1-4-75028	HCPK4	1
3/4	29 Smooth	90BKB	CR1-4-75029	HCPK4	1
3/4	32 Smooth	90BKB	CR1-4-75032	HCPK4	1

GROUNDING CABLE

1/2	4/0	90BKB	CR1-4-500L4/0	HCPK4	1
5/8	4/0	90BKB	CR1-4-6254/0	HCPK4	1
3/4	4/0	90BKB	CR1-4-7504/0	HCPK4	1
1/2	250	90BKB	CR1-4-500L250K	HCPK4	1
5/8	250	90BKB	CR1-4-625250K	HCPK4	1
3/4	250	90BKB	CR1-4-750250K	HCPK4	1

CR1 and CR2 are suitable for connections to copperbond rods – for connections to copper or stainless steel rods, please contact our sales office. Threaded portion of rod should be removed before welding.

Molds for other cable sizes and configurations can be manufactured on request. Special designs for all FurseWELD exothermic welding molds available on request. Note ½" ground rod diameter shown is ½" true diameter, actual shank diameter 0.502"

For many more applications contact us for part numbers and pricing.

LYNCOLE XIT[®] EXOTHERMIC WELDING

Cable to ground rod CR1 & CR2

CABLE TO GROUND ROD CR2 – FURSEWELD

Ground Rod A Ø (")	Wire Size B	Powder Cartridge	Part No. Mold	Handle Clamp	Box Quantity
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LIGHTNING PROTECTION CABLE

1/2	28 Ropelay	90BKB	CR2-4-500L28	HCPK4	1
1/2	29 Smooth	90BKB	CR2-4-500L29	HCPK4	1
1/2	32 Smooth	90BKB	CR2-4-500L32	HCPK4	1
5/8	28 Ropelay	115BKB	CR2-4-62528	HCPK4	1
5/8	29 Smooth	90BKB	CR2-4-62529	HCPK4	1
5/8	32 Smooth	115BKB	CR2-4-62532	HCPK4	1
3/4	28 Ropelay	115BKB	CR2-4-75028	HCPK4	1
3/4	32 Smooth	115BKB	CR2-4-75032	HCPK4	1

GROUNDING CABLE

1/2	4/0	90BKB	CR2-4-500L4/0	HCPK4	1
5/8	4/0	90BKB	CR2-4-6254/0	HCPK4	1
3/4	4/0	90BKB	CR2-4-7504/0	HCPK4	1
1/2	250	90BKB	CR2-4-500L250K	HCPK4	1
5/8	250	90BKB	CR2-4-625250K	HCPK4	1
3/4	250	90BKB	CR2-4-750250K	HCPK4	1

CR1 and CR2 are suitable for connections to copperbond rods – for connections to copper or stainless steel rods, please contact our sales office. Threaded portion of rod should be removed before welding.

Molds for other cable sizes and configurations can be manufactured on request. Special designs for all FurseWELD exothermic welding molds available on request. Note 1/2" ground rod diameter shown is 1/2" true diameter, actual shank diameter 0.502"

For many more applications contact us for part numbers and pricing.

LYNCOLE XIT[®]

GROUNDING

TESTING AND METER EQUIPMENT

AEMC[™] Instruments manufactures professional electrical test and measurement instruments for the industrial, commercial and utility marketplace. Founded in 1893, their products are backed by over 100 years of experience in test and measurement equipment, and encompass the latest international standards for quality and safety.

Lyncole offers the full line of AEMC current measurement probes, ground resistance testers and insulation resistance testers. Please contact our sales department for pricing at sales@lyncole.com or **(800) 962-2610**.



Ground Resistance Tester Model 6417



6470B Ground Resistance Tester

GROUND RESISTANCE MONITOR

GRM 2000 RS



The Lyncole GRM 2000 RS monitors ground resistance and features adjustable alarm limits. With the RS232 interface, the ground resistance can be remotely monitored and the system controlled using a PC via serial, ethernet or web. You can monitor your critical mountain top facility from the comfort of your home or office.

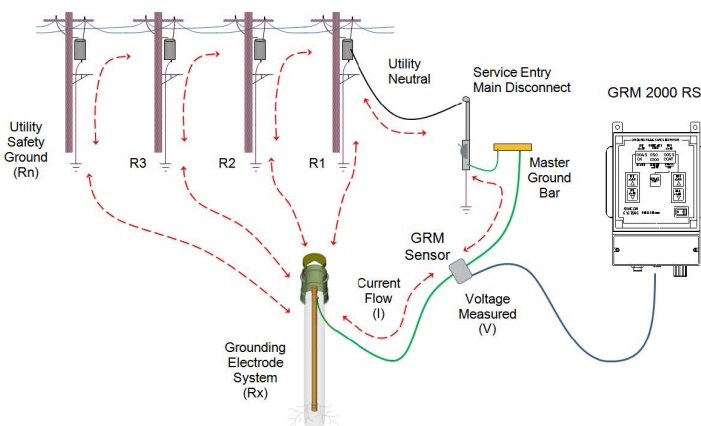
The GRM 2000 RS consists of the meter and sensing head. The meter is mounted in a convenient location and the sensor is installed on the grounding conductor.

Benefits:

- Permanently monitors grounding system performance
- Selectable test rate
- High and low alarm points
- RS232 output
- For use with up to 1000KCMIL conductor
- Monitors grounding system current
- "Live" installation
- Remote monitoring with RS232

Features

- Remote resistance reading/control
- Early warning of grounding problems
- Full-time monitoring
- No probes or additional conductors
- UL listed
- Continuity verification
- No trips to remote sites for testing
- No invalid testing



To measure the grounding system resistance, the GRM method does not need the grounding electrode to be disconnected from the electrical system. This system utilizes multiple electric utility safety grounds as the return path. It assumes that because there are multiple parallel return paths, this return has very low resistance. The unit induces voltage into the grounding electrode via the grounding electrode conductor, measures the resulting current then calculates the resistance.

*Single point ground required. Contact Lyncole with any questions.

LYNCOLE XIT[®]

GROUNDING

LUGS AND CONNECTORS

Lyncole offers the complete line of both Thomas and Betts/ABB products. From splices and taps, to terminals and Hypresses, we ensure you will have exactly what you need to help save time and money while installing a complete XIT Grounding System.

All compression connectors conform to applicable sections of the NEC as well as UL-467 for use in direct burial or concrete embedded grounding applications, and have been tested successfully according to requirements of IEEE Standard 837 and meet or exceed all industry performance requirements.

FEATURES

- Pre-crimp dies for ground rod connectors add mechanical strength to help the connectors withstand power installation and maintain IEEE and UL performance
- All compression elements are made of pure wrought copper (same as the conductor), which completely eliminates the possibility of corrosion due to dissimilar metals
- Heavy Duty connector design carries the equivalent or greater current carrying capacity of the conductor while maintaining high mechanical strength and electrical integrity

COST & TIME BENEFITS

- Requires no special training or complicated tooling
- Each connection can be made in less than 3 minutes
- Compression connections can be installed in all kinds of weather
- Installation process does not produce heat, smoke, toxic fumes, or other hazardous particles



ENGINEERING SERVICES

WHY LYNCOLE?

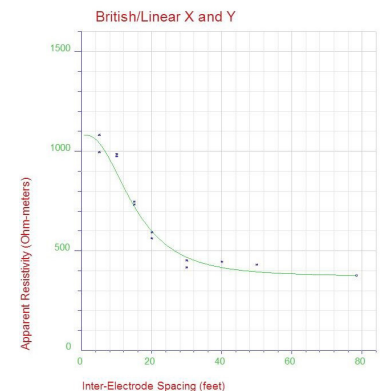
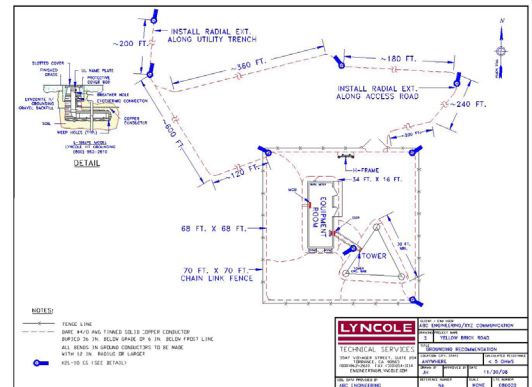
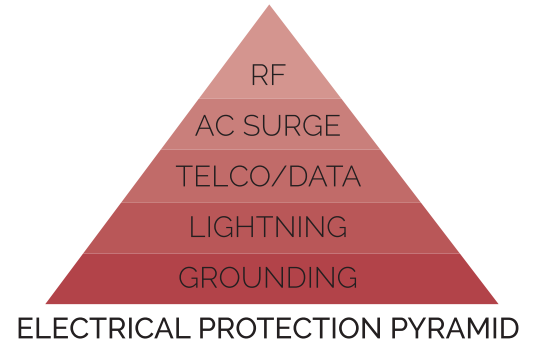
Lyncole has the most experienced staff in the industry on providing grounding, electrical and lightning protection. Our total site protection approach is your best insurance in protection of your personnel, structures and equipment. No matter what your challenge, Lyncole can provide a scientific solution. Our services, described below, are site specific and priced according to the project. Our account managers can work with you to determine specific needs and costs tailored to your project. With over 30 years of experience, we provide you with proven results.

GROUNDING SYSTEM DESIGN

Grounding system designs are the foundation of a well-protected facility and they need to be completed scientifically. We utilize a modulated computer based calculation program that takes the results of Four Point Soil Resistivity Tests and creates a multilayered soil model. Our engineers then create a three-dimensional representation of the grounding system which the computer combines with the layered soil model to predetermine the achieved resistance to earth. The results of these calculations help us in defining the proper design for the target resistance with the site specific considerations. As shown in the diagram to the right, the result is a design based upon science, not estimation.

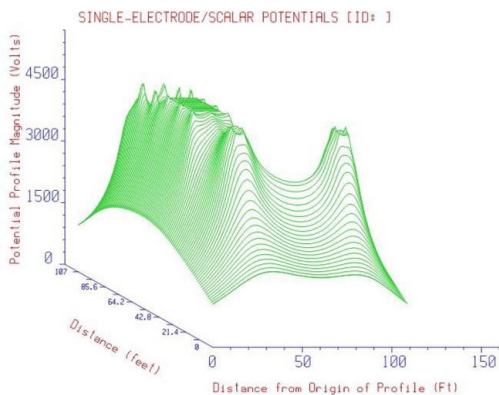
GROUNDING SYSTEM TESTING

Lyncole's engineering team utilizes state of the art testing equipment to test grounding systems around the world. Understanding the benefits and drawbacks of both the Fall of Potential and Clamp on Tests, our engineers evaluate the grounding system to determine the most accurate method of testing. If the tests result in a resistance to earth higher than the client's goal, a series of Four-Point Soil Resistivity Tests are performed, and grounding system modifications are designed and presented to the client. Regardless of the state of the existing grounding system, our engineers have the tools and experience to evaluate and recommend appropriate solutions to achieve an optimal grounding system.



FACILITY SURVEYS AND AUDITS

Lyncole's engineers use the National Electrical Code, NFPA-780, Motorola R-56, Telcordia, and client specific standards to perform a wide range of site and facility surveys. These surveys include reviews of lightning protection by our LPI certified engineers, AC and DC surge protection, electrical systems, inside/outside plant grounding and bonding as well as power quality audits and more. The client is provided with a detailed report consisting of observations and recommendations, explanatory photographs, field test data, AutoCAD drawings, and a grounding system design if necessary. Many of our customers hire Lyncole to either supervise their maintenance crews or bring in experienced contractors to make the recommended changes.



GROUND POTENTIAL RISE STUDIES (GPR)

Lyncole also performs GPR studies for clients when they are installing a facility grounding system in or near a high voltage environment. These studies use the fault clearing time, available fault current, and other factors to calculate the GPR and step/touch potentials. Lyncole engineers perform these calculations in order to determine what measures are required to make the site safe for workers and the public alike. A detailed report with charts (diagram to the left) depicting the site characteristics are included.

TRAINING COURSES

Lyncole's vast experience in the areas of grounding, lightning, and electrical protection make us a great education resource. Our public course is 16 hours of instruction and covers soil resistivity and grounding system resistance testing, grounding system design, communications grounding, bonding, lightning protection, surge protection, and National Electrical Code(NEC). Following completion of these courses, the attendee receives a completion certificate and qualifies for 1.8 continuing education units, 14 BICSI credits and 16 Professional Development Hours. We are a IEEE education partner and approved by ETA. Our courses can be tailored to fit any industry and our instructors have given private courses throughout the country and around the world.

MADE IN THE U.S.A.

ARRA – STATEMENT OF COMPLIANCE

Section 1605 of the American Recovery & Reinvestment Act (ARRA) requires that all the iron, steel, and manufactured goods used in an ARRA project for the construction, alteration, maintenance, or repair of public building or public work must be produced in the United States. Pursuant to 74 Fed. Reg. 14,623 (March 31, 2009) (FAR Interim Rule) and 74 Fed. Reg. 18,449 (April 23, 2009) (OMB Interim Final Guidance), a manufactured good is considered a domestic construction material without regard to the source or origin of components as long as the construction material used in the project is manufactured in the United States. 74 Fed. Reg. at 14,624 & 14,626; 74 Fed. Reg. at 18,452.

Lyncole XIT® Grounding products are manufactured in the United States at our facility in Torrance, California, meeting the requirements of the ARRA as set forth in the regulations



For more information on the American Recovery & Reinvestment Act (ARRA) go to:

http://www.epa.gov/water/eparecovery/docs/2009_09_25_BA_Q&As_Part1_Revised.pdf

WARRANTY INFORMATION

Lyncole Grounding Solutions, LLC DBA Lyncole XIT® Grounding, unconditionally warrants the Lyncole XIT Grounding Systems to be free of defects in material or workmanship, for the following period, according to specified model, from the date of purchase when the defect occurs under normal installation and use.

Standard “K2” models: 30 years

Heavy Duty “K2.5” models: 35 years

Super Duty “K3” models: 40 years

If during this period, the product fails to perform per manufacturer's specifications (i.e., a rise in resistance to earth due to depletion of the Calsolyte® material inside the rod) as a result of defects in material or workmanship, Lyncole XIT Grounding will provide a replacement product without charge within 60 days of receipt of a claim on this warranty. If Lyncole XIT Grounding cannot provide a replacement within 60 days, Lyncole XIT Grounding will refund the purchase price. Lyncole XIT Grounding or Lyncole Grounding Solutions, will not be liable for cost of installation of replacement products. In order to make a claim under this warranty, the claimant must notify, in writing, Lyncole XIT Grounding of the failure of the product to conform to the warranty within 30 days of first discovering the failure of the product. Lyncole XIT Grounding is not liable for incidental damages, the cost of installing replacement product(s), or any other costs.

GLOSSARY OF TERMS

Air Terminal - A metallic rod used on top of structures for lightning protection. May be made of either stainless steel, copper or aluminum. See also Lightning Rod.

Alternating Current (AC) - Electrical current, which reverses direction repeatedly and rapidly. The change in current is due to a change in voltage that occurs at the same frequency.

American Wire Gauge (AWG) - A Standardized wire gauge system. A unit of measurement for wire size.

Ampere (amp) - Unit of current measurement. The amount of current that will flow through a one ohm resistor when one volt is applied. See also Current.

Bonding (bonded) - The permanent joining of two metallic parts to form an electrically conductive path that will ensure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Bonding Jumper (conductor) - A reliable conductor to ensure electrical conductivity between metal parts required to be electrically connected.

Bus Bar - The metal bar used to carry electrical currents to supply electrical circuits or to divert such currents to ground. See also Master Ground Bar (MGB).

Cadweld - A brand of exothermic weld.

Compression Lug - A grounding connector made by using a specially made high compression tool for a grounding conductor to a bus bar. See also Burndy.

Concrete Encased Electrode - A grounding system comprised of reinforcing rods that are contained in the concrete walls and footings. Electrical connections are made directly to the metal reinforcing bars. See also Ufer ground. (This is no longer a recommended grounding method.)

Conductor - A substance that offers little resistance to the flow of electrical currents. Copper wire is the most common form of conductor.

Counterpoise - A buried length of conductor, usually around a structure or tower. See also Ground Ring.

Current - The flow of electricity in a circuit, measured in amperes. See also Ampere.

Driven Rod - A metallic stake used for electrical grounding applications. Usually made of copper clad steel, but can be made of solid copper or galvanized steel. See also Ground Rod.

Direct Current (DC) - Electrical current that flows in one direction only.

Electrolytic Ground Rod - A grounding electrode made of a hollow pipe with natural earth salts that is environmentally friendly to the Earth. See also XIT® Rod.

Exothermic Weld - A permanent electrical connection using powdered metallurgy technology that creates molecular bonds within conductors. See also Cadweld and thermOweld.

Ground - An electrical connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Ground Rod - A metallic pipe or stake used for electrical grounding applications. Can be made of copper clad steel, solid copper, galvanized steel or copper pipe filled with natural earth salts. Also known as a grounding electrode. See also Driven Rod and Electrolytic Ground Rod.

Ground Ring - A buried length of conductor, usually around a structure or tower. See also Counterpoise.

Halo - A ring of conductor installed in a structure, usually just below the ceiling to facilitate interconnection of non-powdered metallic objects.

Institute of Electrical and Electronic Engineers (IEEE) - A professional society for electrical and electronic engineers.

International Association of Electrical Inspectors (IAEI) - A professional society of electrical inspectors.

Joule - A unit of electrical, mechanical and thermal energy. One joule is equal to the amount of energy to the work done when a current of one ampere is passed through a resistance of one ohm for one second.

Lightning Rod - A metallic rod used on top of structures for lightning protection. May be made of either

stainless steel, copper, or aluminum. The new correct technical term is Air Terminal. See also Air Terminal.
Master Ground Bar (MGB) - A metal bar, usually mounted in a dominant area of a structure, to which all other bus bars, grounding electrodes and grounding conductors are interconnected or bonded. See also Bus Bar.

Mechanical Clamp - A device used to secure a conductor to a grounding element. Usually consists of an oval of metal with a bolt that is mechanically tightened onto the conductor. Not considered very reliable as the clamp can corrode or become loose over time.

National Electrical Code (NEC) - The governing code in the United States that contains safety guidelines for all types of electrical installations. Updated every three years.

National Fire Protection Association (NFPA) - An organization that publishes standards such as the National Electrical Code (NEC) (NFPA70) and the Lightning Protection Standards (NFPA 780).

Ohm - The unit of measurement of electrical resistance. One ohm of resistance will allow one ampere of current to flow through a pressure of one volt. See also Resistance.

Ohm's Law - The formula establishing the relationship between voltage, current and resistance. Usually expressed as $V = I * R$ where V is the voltage, I is the current and R is the resistance.

Potential - The work required to bring a unit electrical charge, magnetic pole or mass from an infinitely distant position to a designated point in a static electric, magnetic or gravitational field, respectively.

Power - The measurement of electrical work, usually measured in watts. See also Watt.

Resistance - The opposition to the flow of current in an electrical circuit. See also Ohm.

Soil Resistivity - Resistance per unit of area or volume, measured in ohms meter; the reciprocal of conductivity.

Surge Protection Device (SPD) - A device that will protect equipment from damage caused by surges, spikes and other over voltages. See also Transient Voltage Surge Suppression.

thermOweld - A brand of exothermic weld.

Transient Voltage Surge Suppression (TVSS) - A device that will protect equipment from damage caused by surges, spikes and other over voltages. The correct technical term is Surge Protection Device. See also Surge Protection Device.

Ufer Ground - A grounding system comprised of reinforcing rods that are contained in concrete walls and footings. Electrical connections are made directly to metal reinforcing bars. No longer the correct technical term. The correct technical term is Concrete Encased Electrode. See also Concrete Encased Electrode.

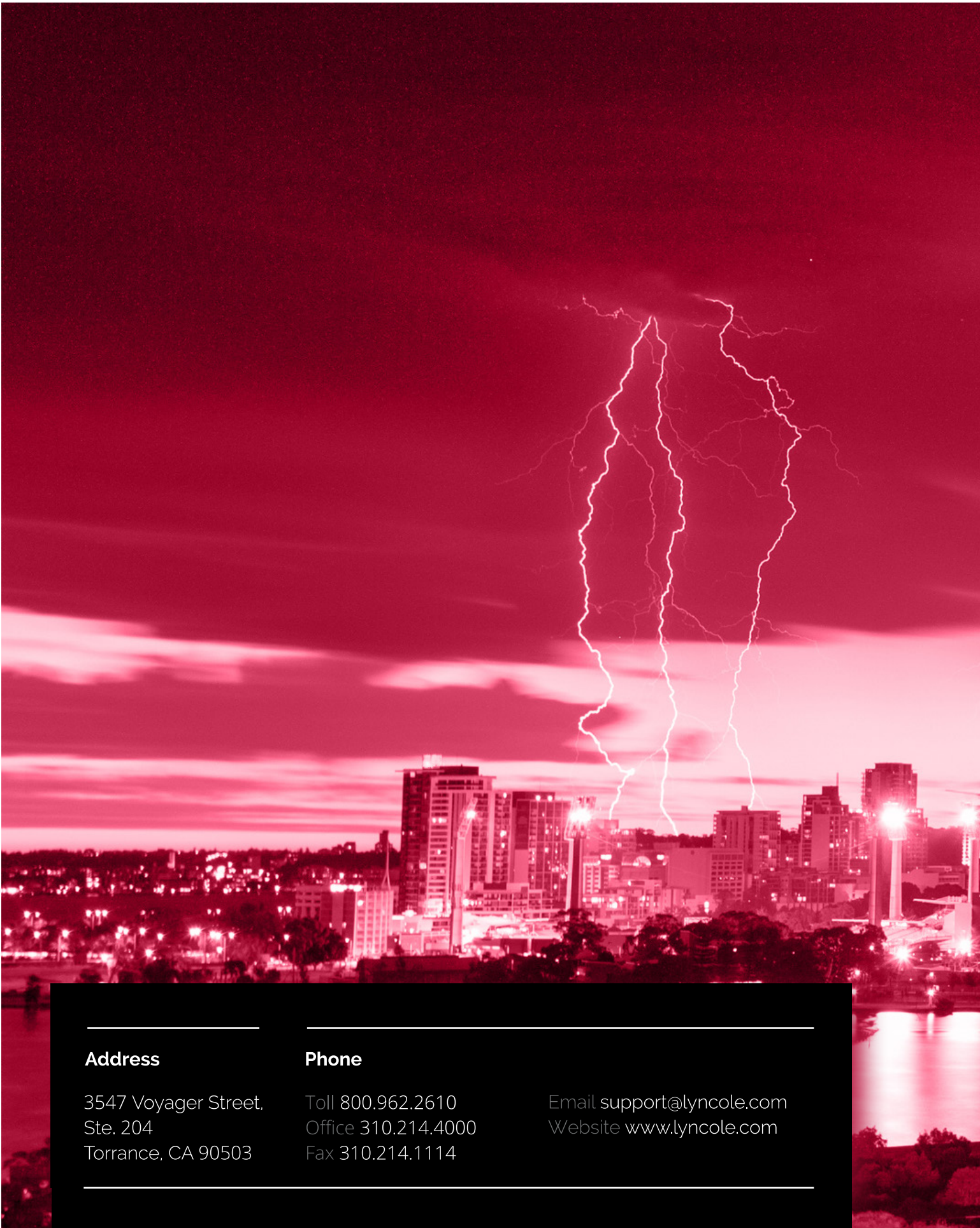
Underwriter's Laboratory (UL) - A non-profit organization that was established by the insurance industry to test devices, materials and systems for safety. If an item passes UL set standards, the device is marked as UL listed.

Uninterruptible Power Supply (UPS) - A device that provides continuous power in case the main power source fails.

Volt - The unit of measurement of electrical force. One volt will force one ampere of current to flow through a resistance of one ohm.

Watt - The unit of measurement of electrical power or rate of work equal to one joule per second. See also Power and Joule.

XIT® Rod - The original, active electrolytic grounding rod. Key component of the complete Lyncole Grounding System.



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