

**ELECTRIC HEATING ELEMENTS  
CHAIN DRIVE BELTS  
AND CONVEYORS**



**NEI NATIONAL ELEMENT, INC.**

4449016

**F**or over 43 years we have provided engineering for complicated installations. Experience and know-how is our advantage! Our teams build, check and prepare each order. With a final inspection before being crated, shipment is then made directly to you. Innovation is our trademark-- Superior quality and delivery is our motto! Customer satisfaction is our most important goal!

## **OUR PATENTS PROVE THAT!**

Patent # 4,016,403 FIREBAR, Patent # 4,449,016 HEATING ELEMENT,  
 Patent # 4,243,872 COIL HEATING ELEMENT, Patent # 4,849,368  
 RIBBON ELEMENT, Patent # 4,337,390 ROD HEATING ELEMENT



*Trademark Office*  
 of Washington this fifteenth day of  
 May in the year of our Lord one  
 thousand nine hundred and eighty-four,  
 and of the Independence of the United States  
 of America the two hundred and eighth

*Keith C. Mason*  
 Attorney

**INNOVATIVE!**  
**ALL OF THE TIME!**







Lorne Best, founder of National Element, Inc. is a sustaining member of the ASM International Detroit Chapter. He holds degrees in engineering plus seven United States patents. He has also created numerous innovations in the design and manufacturing of electric heating elements, chain driven wire mesh belting, and conveyor chains for industrial application. In his retirement, Lorne remains a consultant for the company he founded. It is his aim to maintain a solid foundation for the many long-term relationships he has established.

## **NATIONAL ELEMENT, INC. BUILDS INDUSTRIAL HEATING UNITS, BELTS AND CONVEYORS FOR INDUSTRY**

National Element, Inc. has a new modern plant which includes a full machine shop, a complete fabrication facility and an expanded alloy inventory. National Element, Inc. is your only full service distributor of NIKChrome® Alloys. We have the "Largest Heating Element Bank in the World." All sizes and grades of NIKChrome® wire, ribbon, and rod are stocked for a one-day delivery. We also house a rebuild department to modernize your heating elements for many types of furnaces.

We are continuously pushing the limits of power density and are capable of complex designs for severe environments and higher and higher temperature thresholds. No element is too difficult to form. That is the way management thinks. National Element, Inc. takes pride in manufacturing products that can stand the test of time!

Our company mission is "reasonably priced, top quality products with short deliveries."



**NATIONAL ELEMENT, INC. WITH 30,000 SQUARE FEET IN BRIGHTON, MICHIGAN**



**REPUTABLE QUALITY BACKED BY WORLDWIDE SERVICE**

National Element, Inc. is always available to offer engineering suggestions and service to our customers. Satisfying your requirements with quality products built to perform and last is our top priority. Listening to your needs, we have become the top manufacturer in this highly competitive field. Diverse industries around the world have tried and tested our products and rely on our capabilities, quality and follow through.



Products that make it possible to meet the demands and provide the "get it done yesterday" slogan.



**National Element, Inc. Product Line**

- Industrial Heating Elements
- Conveyors - complete units
- Conveyors Belts
- Reconditioning services, heating racks, insulators, plus spare parts for life extenders of old units
- Laboratory Furnaces
- Resistance Alloys in Stock
- Many ceramics available to build new units or repair your furnace



**RESISTANCE ALLOYS IN STOCK**

- NIKCHROME® A-80ni-20cr
- NIKCHROME® 70-70ni-30c
- NIKCHROME® C-60ni-16cr
- NIKCHROME® D-35ni-19cr
- KANTHAL® ALLOYS
- KANTHAL® A-1 ALLOY Fe-Cr-Al
- KANTHAL® AF ALLOY Fe-Cr-Al
- KANTHAL® APM ALLOY Fe-Cr-Al
- KANTHAL® D ALLOY Fe-Cr-Al
- NIKROTHAL 80 ALLOY
- NIKROTHAL 70 ALLOY
- NIKROTHAL 60 ALLOY
- NIKROTHAL 40 ALLOY

**ELECTRIC INDUSTRIAL HEATING ELEMENTS**

- COIL ELEMENTS
- ROD ELEMENTS
- RIBBON HEATING ELEMENTS
- FIREBAR® ELEMENTS FOR RADIANT TUBES
- PLUGHEATERS
- ELEMENT RACK ASSEMBLIES
- RADIANT TUBES
- VACUUM FURNACE ELEMENTS
- MOLYBDENUM
- TUNGSTEN

**LABORATORY FURNACES**

- CRUCIBLE
- COMBUSTION
- MUFFLE
- HOT PLATE
- COAL ANALYSIS
- HIGH TEMPERATURE

**CONVEYOR CHAIN**

- CAST PINTAL CHAINS
- ENGINEERED CLASS
- ROLLER CHAINS
- FLAT TOP
- GULL WING

**CONVEYOR BELTS**

- WIRE MESH
- CHAIN DRIVE BELTS
- HINGE PLATE APRON BELTS
- U-LINK BELTS
- SLAT CONVEYOR BELTS
- DRAG FLIGHT BELTS
- ROLLER BELTS
- FASTENER CONVEYOR BELTS
- BULK HANDLING BELTS
- FURNACE BELTS
- WIRE MESH BELTS

**CONVEYOR APPLICATIONS**

- SCRAP CHIP CONVEYORS
- FASTENER CONVEYORS
- APRON CONVEYORS
- FOOD INDUSTRY
- HEAT TREAT

Kanthal™ Registered Trademark of Kanthal Corp.

**NIK<sup>®</sup> CHROME** ELECTRIC HEATING ELEMENTS

**Ribbon Heating Elements**

- LONG LIFE • HIGH POWER RATING • LOW WATT DENSITY
- TEMPERATURE UNIFORMITY AND CONTROL • CONTROLLED THERMAL EXPANSION • LIGHTWEIGHT DENSITY • MINIMAL MAINTENANCE • HIGH TEMPERATURE 115°C - 2100°F
- SIMPLE REPLACEMENT • RIBBON ELEMENTS ENGINEERED TO FIT YOUR FURNACE REFRACTORY • ANY SIZE, ANY SHAPE AND KILOWATT RATING

**Furnace Applications**

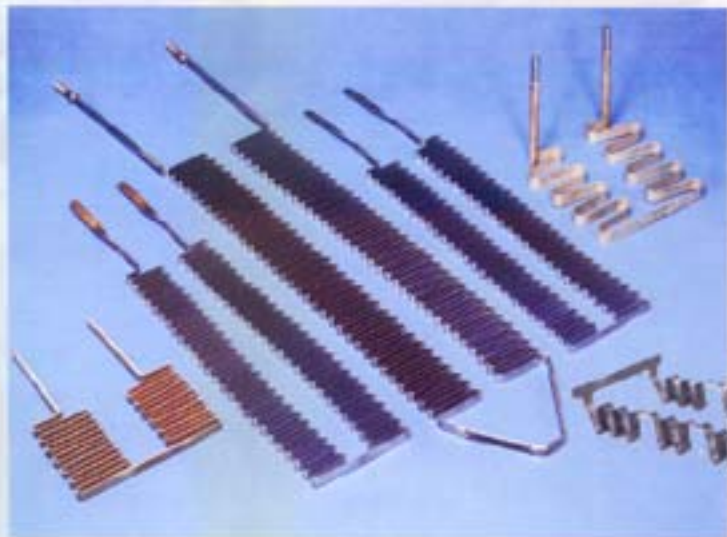
- AGING • ANNEALING • AUTOMOTIVE GLASS BENDERS • BELL BOX • BRAZING • CONTINUOUS • CONVEYOR CHAIN
- DRIVE BELT • DROP BOTTOM • HARDENING HOLDING
- KILN • MELTING • MESH BELT • MUFFLE PIT • POT • PUSHER
- RETORT • ROLLER HEARTH SINTERING (P/M)
- TOOL ROOM • VACUUM ATMOSPHERE

Ribbon elements are often made consisting of two rows. They are found suspended in refractory tile in the ceiling, walls and floors of small industrial high temperature furnaces. This style of element is used by almost every furnace manufacturer.

We have Resistance Alloys in stock. We also stock material in all popular sizes, in both NIKChrome 80Ni-20Cr, 35Ni-20Cr Kanthal® iron-chrome-aluminum alloys. Many accessories, which include pins, hooks and insulators are also available.

FireLine, our most recent U.S. Patent in electric heating technology, is the leader in heating element engineering and element manufacturing. FireLine electric heating has high quality, high power density, excellent hot strength, and low watt density. Primary feature of the FireLine ribbon element is the shaped strength of the ribbon cross-section forming into the rigid channel shapes. The material is extremely rigid when crimped into this unique shape, which gives the element the extra staying power of much more expensive heavy cross-section elements.

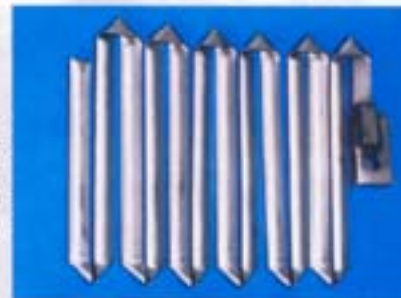
**NATIONAL ELEMENT, INC. IS THE LARGEST SOURCE FOR QUALITY ELECTRIC HEATING ELEMENTS. WE HAVE BEEN MANUFACTURING FOR 43 YEARS AND OUR LINE OF HEATING ELEMENTS IS SECOND TO NONE. NATIONAL ELEMENT, INC. WILL MEET ALL YOUR REQUIREMENTS AND MORE.**



MANY SHAPES OF RIBBON ELEMENT

RIBBON ELEMENT NO SHAPE IS TOO DIFFICULT TO FORM

ELEMENT FOR GLASS BENDING FOLDED AND FORMED



GLASS FURNACE FIRELINE ELEMENT





### Rod Overbend Element

Elements vary in shape and size. Element life is extended due to the greater cross sectional surface. Rod sizes begin at 6 GA. (.162 dia.) not exceeding 1/2" diameter. We stock all sizes in 80Ni-20Cr known as NIKChrome® A and K. We also stock many sizes in 70/30 Alloy, NIKChrome®, and Iron Chrome Aluminum Alloys known as Kanthal® Alloys.

Blanket insulation is used in modern furnaces. Many box furnaces use this method for improved efficiencies with less heat loss.

### About Moly Heating Elements

Pure Molybdenum is the classic material for high temperature, high powered heating elements;

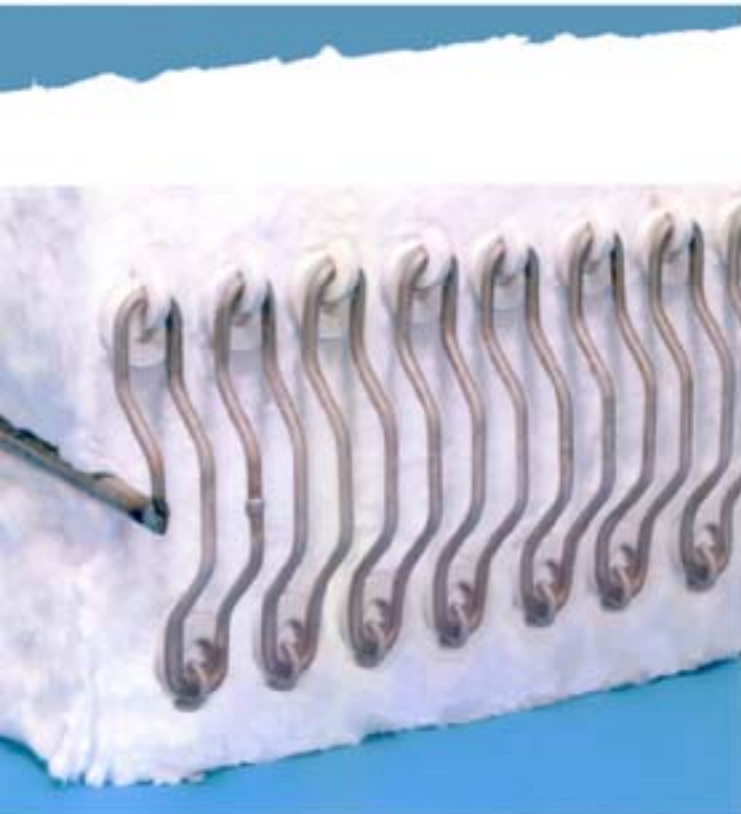
heating furnaces to 1900°C, (3452°F); or power elements up to 100 watts per square inch (of element surface area).

### Molybdenum Elements

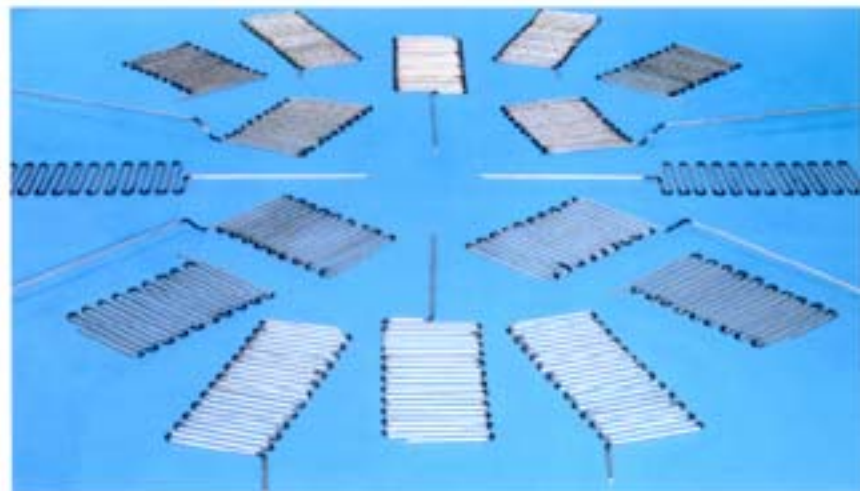
We manufacture Moly heating elements of all sizes and types including: **Rod, Bar Strip.**

National Element, Inc. stocks pure Molybdenum and other specialty materials in a wide range of popular sizes for: **Elements, Hangars, Connectors and Terminals. We form, twist, coil, weld, braze and machine Molybdenum components.**

- New Designs
- Upgrades
- Replacements
- Emergency Repairs



**TYPICAL CROSS SECTION OF BLANKET INSULATION AND ROD OVERBEND ELEMENT**



**MOLY ELEMENTS FOR HIGH TEMPERATURE VACUUM ATMOSPHERE FURNACES**



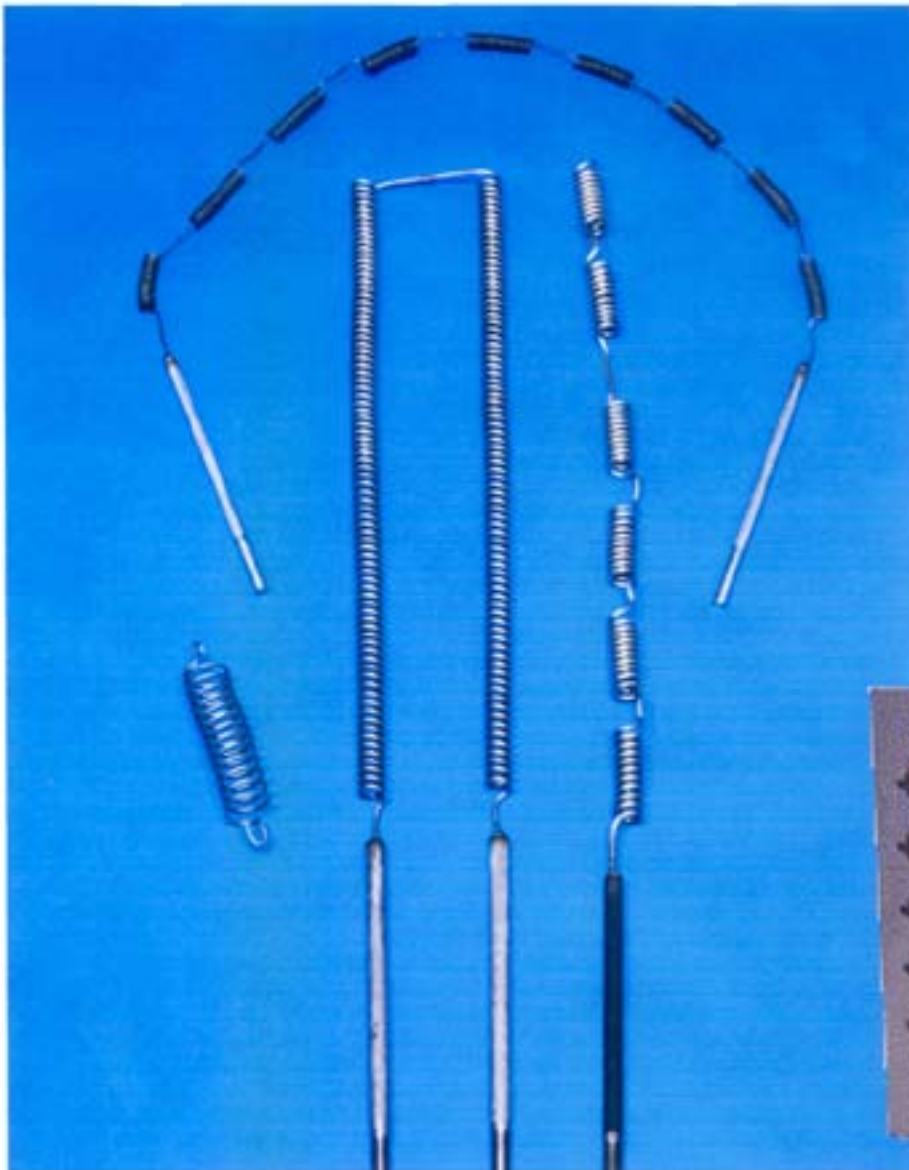
**NIKCHROME® ROD OVER BEND ELEMENTS**

## **NIK** CHROME **COIL HEATING ELEMENTS**

### **Coil Heating Elements**

Stepped coil heating elements are common in draw furnaces. Heavy alloy frames hold ceramic spools of various shapes and sizes to accommodate the particular requirements of each furnace. National Element, Inc. fabricates elements to your specifications. We can supply new installations, replacement units or modify

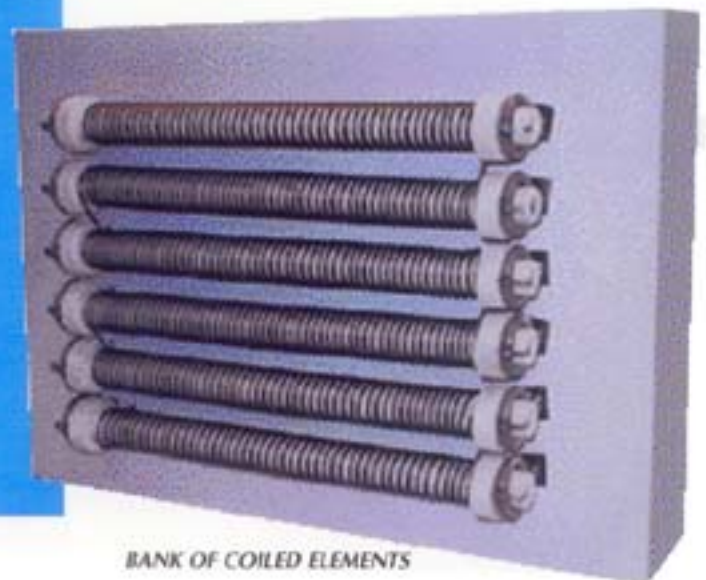
to update your present equipment, engineered to fit your furnaces. Coil elements are very efficient and can be engineered to fit into limited and restricted areas. National Element, Inc. can build units with heating ranges from 200°F to 2300°F in any multiple needed.



STEPPED COILS



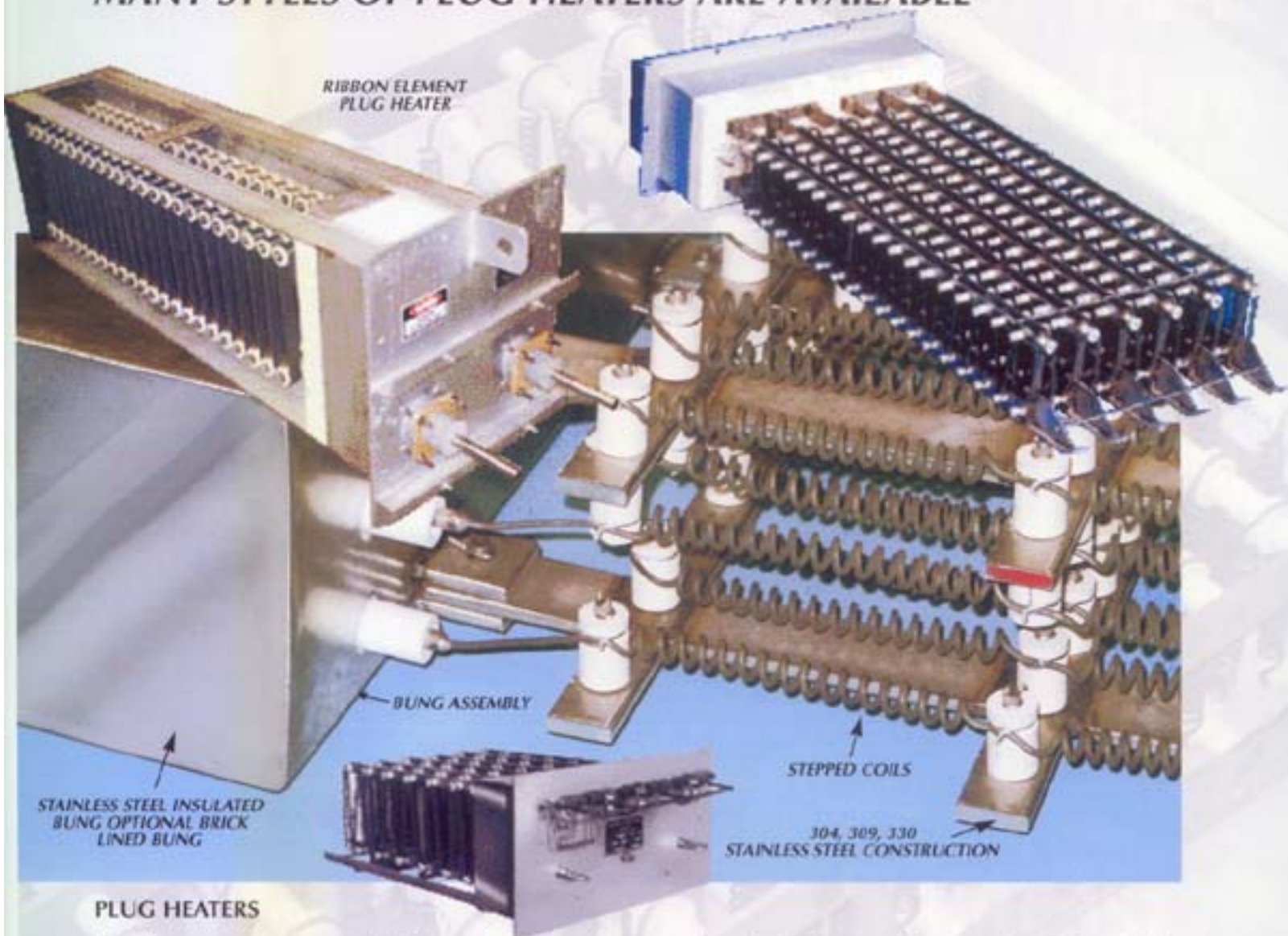
COIL ELEMENTS



BANK OF COILED ELEMENTS



## MANY STYLES OF PLUG HEATERS ARE AVAILABLE



### PLUG HEATERS

Plug heaters are constructed with open coils and are used in high temperature industrial applications such as glass annealing, tempering and air drawn heat treating furnaces. Variance from 15KW to 500KW for use with any voltage and are rated for a maximum element temperature of 1450°F. We have a variety of standard sizes in both vertical drop-in and horizontally mounted units, as well as sizes to fit

all units. Rack assemblies vary from 304 stainless steel for low temperature drying to 330 stainless steel for high temperature draw furnace applications.

Steel top plate and terminal cover box are part of the assembly. Forced air plug heaters are engineered for industrial furnaces and built with rugged construction and dependability to last.

- Rebuilding & Reconditioning Service
- Stepped Coil Elements
- Ceramics Replacement
- Furnace Type: Draw Furnaces  
Dryer and Forced Air Ovens
- Temperatures to 1450°F - (900°C)





## **FIREBAR® HEATING ELEMENTS**

### **FIREBAR® Features –**

- Firebar® requires no Transformer
- Process Temperatures to 1850°F
- Horizontal or Vertical Installations
- Lengths from 18" to 10' with Six Sizes of Heavy Round Rod in Two Rows for most Kilowatt Requirements.

### **Standard Diameters Available:**

2-3/4", 3-1/4", 3-5/8", 4-1/4", 4-7/8"  
5-1/4", 6", 6-1/8", 6-3/8", 7", 7-3/4".

### **Firebar® Construction**

The electrical path of the Firebar® radiates outward from the central core providing usable heat for the full length of the radiant tube. The Firebar® is constructed allowing replacement of individual conductors without replacement of the complete unit. The conductors are made of 80NI-20Cr heavy round rod making it compatible for many different applications that need speciality alloys.

MANY SIZES AVAILABLE



FOR USE IN RADIANT TUBE FURNACES

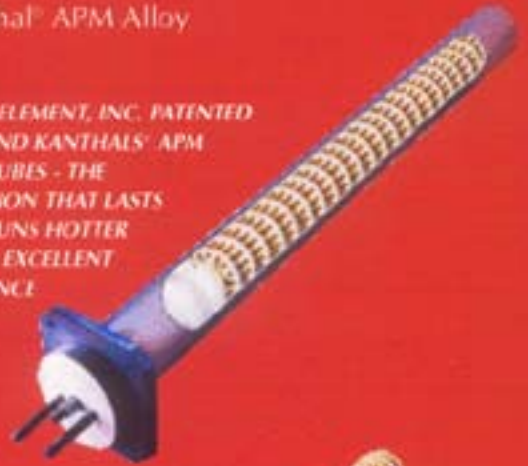


Each circuit contains a thermocouple for controlled start ups. Units are shipped from stock complete with operating instructions, terminals, insulation, all internal connections, and a base plate for vertical operation. Sizes listed are standard, other diameters are available based on 480volt, Wye connected circuit, two (2) elements per phase, and various effective heater lengths and total wattage.

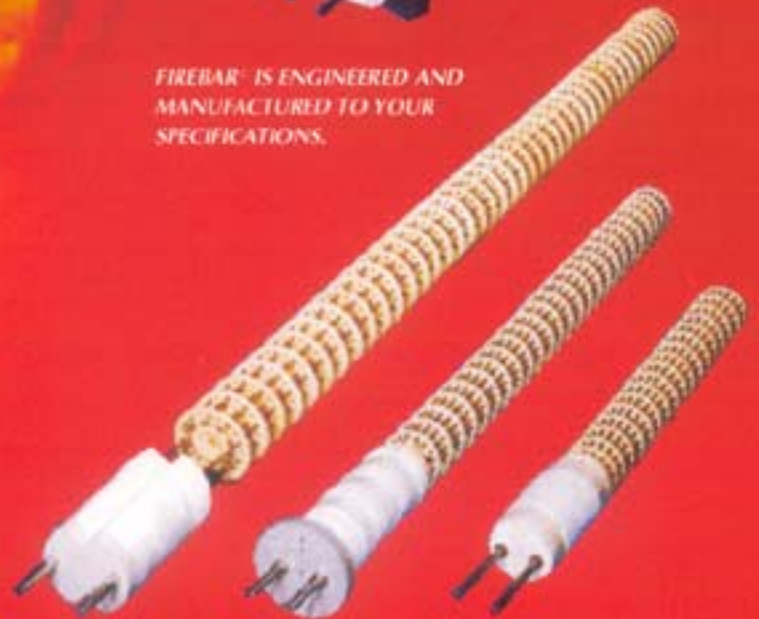
#### Available Resistance Alloys

- NIKChrome® A- 80Ni-20Cr
- NIKChrome® C- 60Ni-16Cr
- NIKChrome® D- 356Ni-19Cr
- 70-30 Alloy - 70Ni-30Cr
- Kanthal® AF Alloy
- Kanthal® APM Alloy

*NATIONAL ELEMENT, INC. PATENTED  
FIREBAR® AND KANTHALS® APM  
RADIANT TUBES - THE  
COMBINATION THAT LASTS  
LONGER, RUNS HOTTER  
AND GIVES EXCELLENT  
PERFORMANCE*



*FIREBAR® IS ENGINEERED AND  
MANUFACTURED TO YOUR  
SPECIFICATIONS.*





**CONVEYOR BELTS KEEP THE LOADS MOVING SMOOTHLY WITHOUT SLIPPAGE OR HESITATION.**

Basic types of belt drives are available to meet your requirements using various systems—i.e. plain pulley drives, snubbed pulley drives, pressure roll drives, plus tandem and tractor drives.

**THERE ARE MANY OPTIONS—CALL OUR ENGINEERING DEPARTMENT.**

- CHAIN DRIVE BELTS • WIRE MESH BELTS
- ROLLER CHAIN BELTS • PINTLE CHAIN BELTS
- HINGE PLATE BELTS

CONVEYOR BELTING COILED FOR SHIPMENT



BALANCE WEAVE WITH GUARD EDGE

HINGE PLATE BELT

WIRE MESH BELTS

COMPOUND BALANCE WEAVE FOR SMALL PARTS



**Tough!  
Sturdy!**

The name of the game for these transfer belts—with complete safety and continuous transferring of various types of products through harsh and unfriendly conditions:

Tough, Sturdy and **DEPENDABLE**—meeting the demands of industry.



HINGE PLATE BELTING  
PARTIALLY DISASSEMBLED

U-LINK  
CONVEYOR BELT



HINGE PLATE BELTING  
VARIOUS SIZES AVAILABLE  
TEFLON COATED IF NEEDED

ICE  
PARTS



## **RUGGED CONVEYORS FOR HEAVY-DUTY MATERIAL MOVEMENT**

All conveyors built to requested specifications—engineered to meet particular needs and space requirements.

## **ROLLER and PINTLE CHAIN**

Roller chains are fabricated to the highest quality standards. Each component of the chain is carefully scrutinized during the manufacturing process.

Pintle chains are available in many pitches, with or without special attachments. The principle application is for high temperature continuous heat treating furnaces.



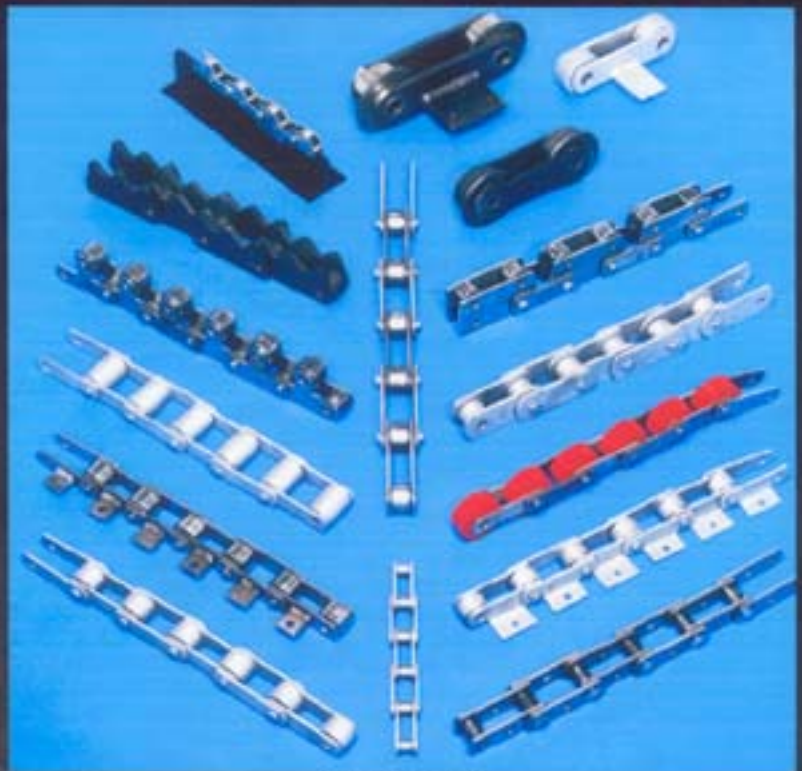




PINLE CHAIN LINK



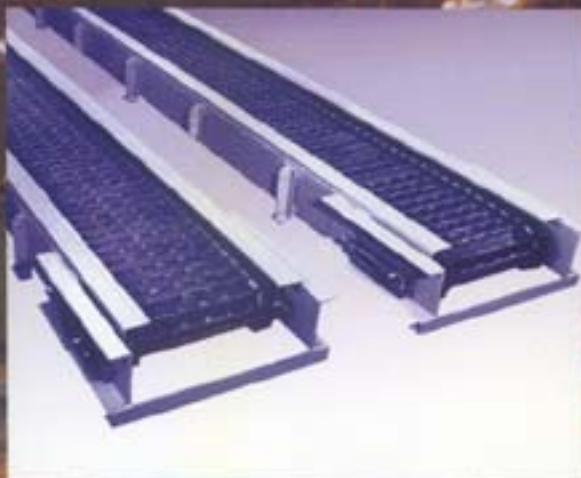
QUENCH TANK CONVEYOR



ROLLER CHAIN



EXTENDED EDGE CONVEYOR BELT



SCRAP CONVEYOR



WIRE MESH CHAIN



**NEI** *CERAMICS FOR ELECTRIC HEATING ELEMENTS*  
**CHROME**



*SPOOLS, BUSHINGS AND SPECIALS*

• **Ceramics and Heating Element Accessories**

National Element, Inc. carries a full line of ceramics for your furnaces and ovens. Many standard element support systems are used. All sizes of ceramic tubes are in stock. Thermocouple two hole ovals, and terminal sleeves for heating elements **OUR SPECIALTY.**



*TERMINAL INSULATORS AND SUPPORT TUBES*



*CERAMICS AND SPECIALS*



*SPOOLS, BUSHINGS AND SPECIALS*



## FURNACE ACCESSORIES



SUPPORT HANGERS AND HOOKS



TERMINAL LEADS AND CONNECTORS

## NATIONAL ELEMENT, INC. LABORATORY FURNACES

Muffle furnaces operate on AC or DC at the usual line voltages up to 250 volts. Temperature is controlled by a premium microprocessor control system, digital temperature set point and readout. Stainless steel casing is fully prewired. Manual control option, with bumperless transfer.

*Ninety years of heating  
"Know How"  
Since 1910*



MODEL # FA 120 FIELDNER FURNACE  
FOR DETECTING VOLATILE MATTER  
IN THE ANALYSIS SAMPLE OF  
COAL AND COKE



# REPLACEMENT HEATING ELEMENTS

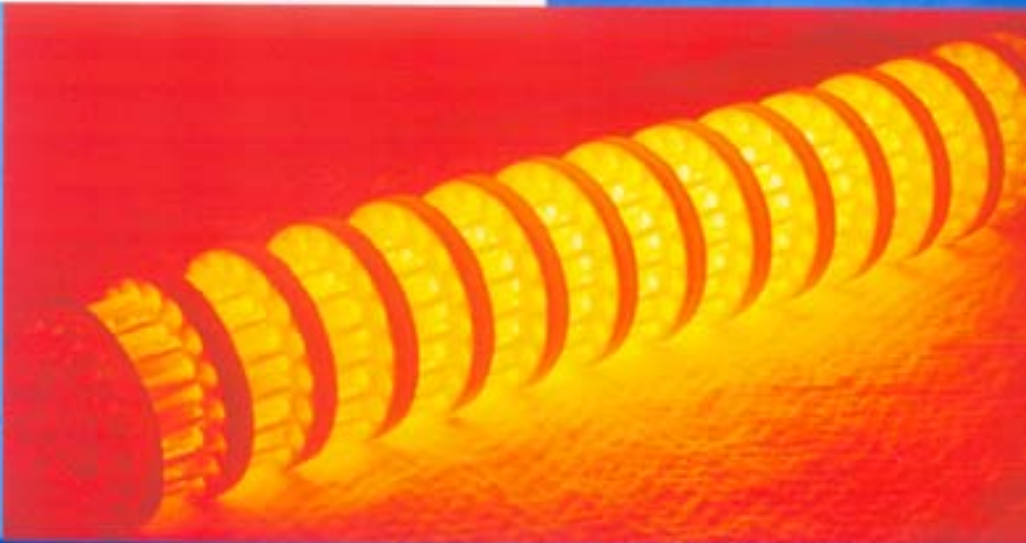
For the following types of **Furnaces, Ovens and Kilns**

- ATMOSPHERE • ANNEALING • AUTOMOTIVE BENDER • BATCH
- BELL • BELT • BENCH • BOX • BRAZING
- CARBURIZING ATMOSPHERE • CONTINUOUS CONVEYOR
- DRAW • ELEVATOR • ENDOTHERMIC GENERATORS
- FLUIDIZED BED • FLOAT LEHRS • FORCED AIR RECIRCULATING
- GLASS BENDING LEHRS • GLASS LEHRS • HARDEN • HEARTH
- HOLDING • KILNS ELECTRIC • LABORATORY
- MELTING • MESH BELT • MUFFLE OVENS • NITRO-CARBURIZING
- POT • PUSHER • QUENCH • RADIANT TUBE • RETORT
- ROLLER HEARTH • ROTARY HEARTH • SALT BATH • SINTERING P/M
- TEMPER • TIP-UP • TOOL ROOM • VACUUM • WALKING BEAM

*“Largest Heating Element Bank in the World”*

[www.nationalelement.com](http://www.nationalelement.com) • E-mail: [info@nationalelement.com](mailto:info@nationalelement.com)









# INDUSTRIES SERVED

**AUTOMOTIVE**



**AIRCRAFT**



**STEEL**

**GLASS**

**HEAT TREAT**



**FURNACE**



**CERAMICS**



**FASTENER**

**HEATING ELEMENTS FOR INDUSTRY**

**1-800-600-5511**



**NATIONAL ELEMENT, INC.**

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www.nationalelement.com • E-mail: info@nationalelement.com

National Element, Inc. is always available to share engineering advice and service to our customers. Satisfying all of your heating and conveyor requirements is our challenge. We build products to perform on a continuous schedule. Quality is our number one goal. By listening to your needs, we have become the top manufacturer in this highly competitive field.