Abex

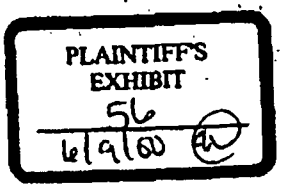
An IC Industries Company

Automotive Group

Welcomes

BROADWAY BRAKE, INC.

MAY 30, 1979
WINCHESTER, VIRGINIA



Broadway Brake and Customer Attendees

JOE MARTIN
Broadway Brake

PHIL D'ANGELO
Broadway Brake

DAVE NICHOLS
BFI

BERNARD ZUTANT
J. F. & S. Leasing

NICK BRUNO
Nick Bruno Trucking

ROBERT WALL
Sea Land Service

FRANK SCARAMUZZI
Stop & Shop

ROLAND D. MOSS
Sweetlife Foods

RAY LaFERRIERE
United Truck Leasing

Abex Attendees

FRANK CAPPUCCI
Sales Representative

J. R. AMERENA
Sales Representative

CHARLIE MALLORY
Manufacturing Rep

EARL POTTS
Manufacturing Rep

Table of Contents

	Page
AUTOMOTIVE GROUP	1
FRICTION PRODUCTS DIVISION	2
Units in the Division	3
International Affiliates	10
Research Center	14
Original Equipment Approvals and Customers	31
Products	34
SIGNAL-STAT DIVISION	37
Manufacturing Facilities	38
Major OEM Customers	39
Products	40
KOKOMO SPRING DIVISION	47
Manufacturing Facilities	47
Major Industries Served	47
Products	48
A. L. HANSEN DIVISION	49
Manufacturing Facilities	49
Major Customers	49
Products	50
JOHN GILLEN DIVISION	56
Manufacturing Facilities	56
Major Customers	56
Products	57

Automotive Group

Abex Corporation is the Commercial Products Group of IC Industries. Abex operates with four product groups which serve such basic industries as steel, mining, automotive, railroad, aerospace, defense, petrochemical, and general manufacturing.

The Automotive Group of Abex consists of the following divisions:

Friction Products
Signal-Stat
Kokomo Spring
A. L. Hansen
John Gillen

The Group is an important supplier to both the manufacturers and the users of automotive vehicles.

Friction materials are used in braking passenger cars, trucks, buses, and aircraft throughout the free world. The Group also supplies these materials for off-highway vehicles, material-handling equipment and industrial machinery.

Lighting, signaling, reflecting, warning, and safety devices are provided for commercial and emergency vehicles. These include turn signals, back-up lights, reflectors, rotary beacons, sirens, mirrors, and fire extinguishers.

The Group also supplies a complete line of replacement air-conditioning parts for trucks, buses, farm and construction vehicles.

It also manufacturers tire hardware for passenger car and heavy duty truck applications.

Specialized hardware such as locks, handles, hinges, window regulators, and cargo tie-downs are manufactured for the heavy duty market.

Other products include coil springs and small metal parts. Coil springs are supplied to the farm implement, transportation, furniture, appliance, roll-up door, and material-handling industries.

Small metal parts are supplied to the automotive, appliance, and electronics industries.

The Abex Automotive Group continued to set new records in 1978 with sales of $210 million, nearly a 17 percent increase over 1977.

This brochure is a brief outline and overview of the activities of the units which comprise the Automotive Group.

FRICTION PRODUCTS
DIVISION

Friction Products Division

The Friction Products Division is the world's largest independent manufacturer of friction materials for the braking of aircraft, passenger cars, trucks, buses, off-highway equipment and industrial machinery.

For aircraft, Friction Products supplies materials compounded of powdered metal, pressed to shape and sintered. For most automotive brakes, the Division supplies an organic mixture which may be rolled, extruded or heat-and-pressure molded, depending upon the type of application. Products are delivered as rolls, blocks for trucks and as linings or disc pads for passenger cars. Individual friction formulations are carefully developed for specialized service and closely controlled during manufacture.

The Division is also widely experienced in non-automotive braking applications such as those for industrial machinery, cranes, mine hoists, power shovels, back hoes, tractors and the like. Just as Friction Products is able to supply the specified braking material for cars made anywhere in the world, it is able to do the same for industrial machinery regardless of where it is manufactured.

In addition, Friction Products manufactures laminated plastic components of ABK material, made from resin-impregnated fabric molded under heat and pressure. Providing excellent bearing service under impact or sustained pressure, ABK material is used in steel rolling mill bearings, ball-joint suspension bearings for autos and in many different types of industrial machinery.

Abex first started manufacturing friction materials in 1902 and has been growing in the business ever since. Consistent dedication to quality, dependability and responsibility has enabled Abex to assume a position of world leadership in the friction products industry.

Worldwide sales for the Friction Products Division in 1978 amounted to $143 million, an increase of almost 17 percent over 1977.

DIVISION CAPABILITIES

The importance of the customers we serve attests to our role and reputation in the friction materials field. Many of the world's largest automobile, truck and aircraft manufacturers purchase our products for original equipment installation and service. Abex friction materials are also approved for use on some of the world's fastest and most exotic passenger cars. As recognized leaders in friction material technology, our products are original equipment components for vehicles of practically every description — many of the smallest, the largest, the fastest, the most expensive passenger cars; light trucks and heavy trucks; railroad trains and mass transit systems, and the tiniest private aircraft in the world. A list of our original equipment customers is included on pages 31, 32, and 33.

Samples of our original equipment brand name labels are shown on page 34.

In addition to our original equipment business, the Friction Products Division has extensive replacement distribution through many of the largest aftermarket distribution systems, rebuilders and brake and axle manufacturers. Samples of labels used to market our products through our Abex distributors and through NAPA are shown on pages 35 and 36.

The scope of our present volume and facilities for replacement business gives us great flexibility to custom-tailor special programs to meet customer needs. Our packaging and warehousing facilities enable us to offer private-brand, custom packing, multiple point delivery, or any other custom-designed program which best fits our customer's requirements.

The combined talents, reputation, know-how and products available in our Division are tremendous assets to our marketing effort throughout the world and we make every effort to capitalize on these assets. Our international fund of knowledge has been particularly helpful in many national markets in the development and marketing of friction materials for imported as well as domestic applications. To date we have experienced most gratifying success in these areas and we firmly believe that we have the quality, product availability, expertise and flexibility to put together friction material which cannot be equaled by any of our competitors.

UNITS IN THE DIVISION

The Friction Products Division (FPD) now operates eleven (11) plants in North America and Europe. In addition, it has joint venture and license affiliations with several other friction material manufacturers in most of the world's major markets. One of these, Sundaram-Abex Limited, is a company in which Abex has a 30% ownership. The plant began production in August 1976 and now produces original equipment and replacement automotive brake lining for heavy-duty commercial vehicles and passenger cars. Sundaram-Abex is located in Madras, India, and employs 191 people at its plant and offices which contain 43,000 square feet. A complete list of international affiliates is shown on pages 10 and 11.

A brief description of some of the operating units in the Friction Products Division follows.

ABEX PAGID GMBH (APREG) — GERMANY

APREG for many years has been an approved original equipment supplier to the European passenger car industry for disc pads and drum brake linings. From its location in Essen, West Germany, the company now supplies a major portion of the original equipment disc pads used in Germany, including those on many popular models of Audi, Ford, Opel, Volkswagen and other car makes. APREG is known throughout Europe as a leading company in the friction materials industry and its products establish a standard of performance for German friction materials.

Manufacturing Facilities

Square Feet:	148,000
Employees:	534

ABEX PAGID S.A. (APESA) — FRANCE

APESA is one of the largest European manufacturers of disc pads. Its shipments go to many of the finest automobile and brake manufacturers in Europe, including among others Peugeot, Chrysler-France, Renault and Volvo.

In addition to its original equipment disc brake business, APESA offers a complete line of friction products through its wide-ranging network of distribution which stretches from Canada to the Far East.

Manufacturing Facilities

Square Feet:	226,000
Employees:	1109

FRENDO ABEX — ITALY

FRENDO ABEX, with factories throughout Italy, is one of the largest friction material manufacturers in Italy. Its products have wide acceptance in Europe and their quality is recognized by major original equipment customers such as Alfa Romeo and Fiat.

Manufacturing Facilities

Orzinuovi (Brescia) Organic Materials Plant

Square Feet:	255,000
Employees:	405

Orzinuovi (Brescia) Sintered Metallic Plant

Square Feet:	27,000
Employees:	37

Avellino (Naples area) Plant

Square Feet:	64,000
Employees:	94

Primary Products

Disc brake pads, drum brake linings, truck blocks, clutch facings, and sintered metallic friction materials.

ABEX INDUSTRIAL S.A.— MEXICO

Our company in Mexico is the leading manufacturer of friction materials in that country. By utilizing the technology available from our European and other North American plants it has experienced great success in Mexico in most friction material marketing areas, including OE. OE service and replacement sales of disc pads, drum brake linings, and truck blocks.

Manufacturing Facilities

Square Feet:	84,000
Employees:	292

Warehouses

Mexico City, Guadalajara, Monterrey.

ABEX INDUSTRIES LTD. — CANADA

Our Canadian company markets throughout Canada products which are manufactured in our plant in Lindsay, Ontario, as well as products manufactured in our U.S. and European plants. This access to a full range of top quality products, together with the advantage of being able to market finished drum brake shoe and lining assemblies, enables our Canadian marketing group to offer a very complete and effective program to our valued customers.

Manufacturing Facilities

Square Feet:	75,000
Employees:	155

Warehouses

Toronto (Including Sales Office)

Square Feet:	25,000
Employees:	16

Montreal

Square Feet:	8,000
Employees:	9

Vancouver

Square Feet:	5,600
Employees:	6

Winnipeg

Square Feet:	2,600
Employees:	3

FRICTION PRODUCTS DIVISION – UNITED STATES

Our friction materials plant in Winchester, Virginia (which is also the site of our Friction Products Division International Headquarters) is the largest plant under one roof in the Abex complex of plants. This plant is one of the largest industrial employers in northern Virginia and manufactures friction material for practically any vehicle – from the largest industrial equipment to the smallest passenger cars and airplanes. Additional plants in Salisbury, North Carolina and Cleveland, Ohio supplement the production of our Winchester, Virginia plant.

Manufacturing Facilities

Winchester, VA

Square Feet:	457,000
Employees:	956
Primary Products:	Blocks, strips and disc pads for trucks and buses; drum brake linings and disc pads for passenger cars.

Salisbury, NC

Square Feet:	62,000
Employees:	135
Primary Product:	Heavy duty blocks.

Cleveland, OH

Square Feet:	63,000
Employees:	149
Primary Products:	Sintered metallic aircraft brake segments, pads, rings.

Warehouses

Trevose, PA

Square Feet:	16,500
Employees:	9

Atlanta, GA

Square Feet:	15,100
Employees:	8

Hayward, CA

Square Feet:	14,000
Employees:	7

Wood Dale, IL

Square Feet:	10,000
Employees:	9

Quality Control

- One inspector for every nine employees.
- Complete analytical and friction test lab on site at each plant.

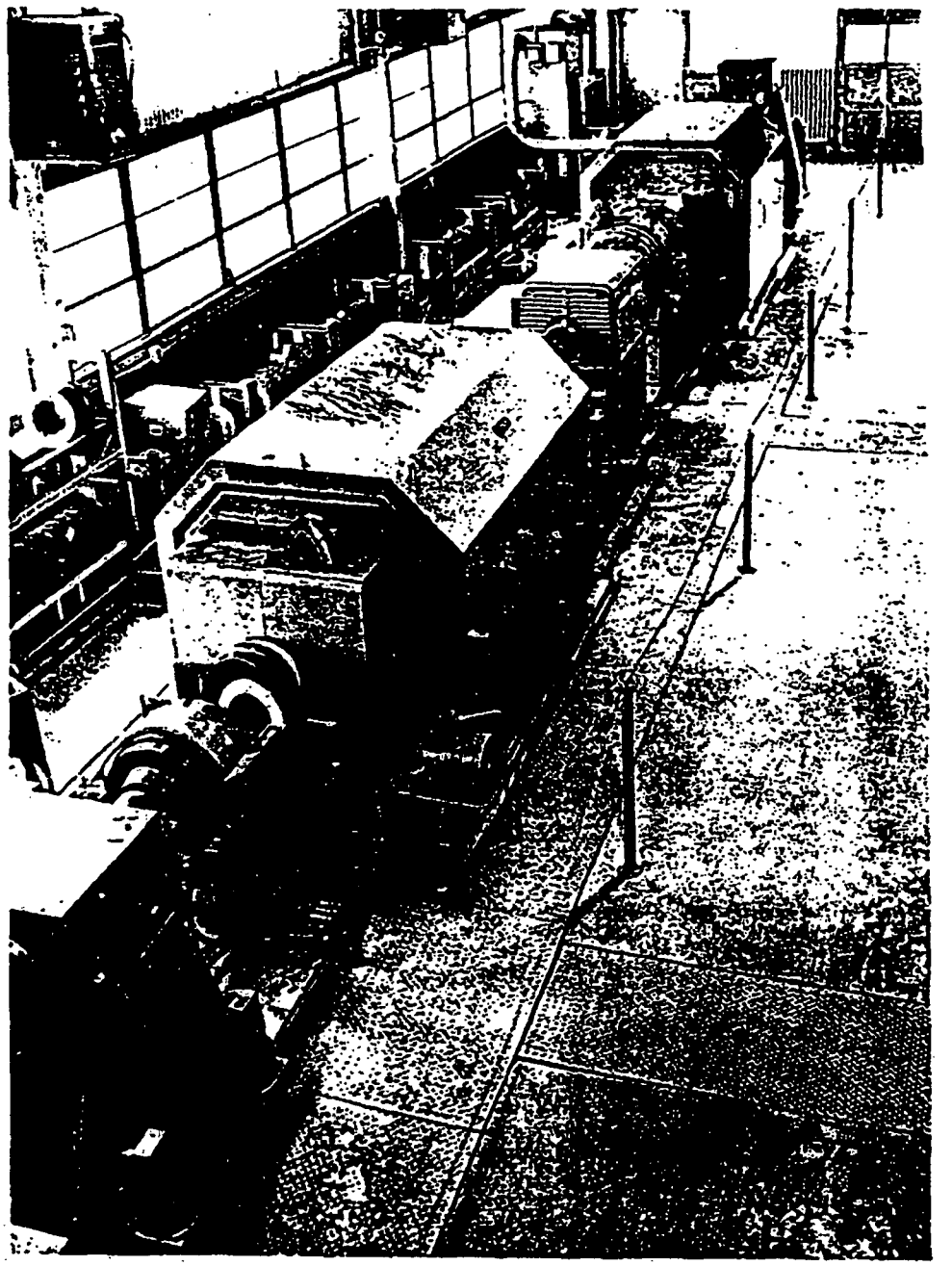
Quality Assurance

- Friction Products Division maintains a quality assurance committee to oversee daily quality control activities.
- Periodic audits are conducted by our corporate R&D Department.

Sintered Metallic Friction Materials

In addition to traditional organic friction materials, FPD also manufactures metallic friction materials and aircraft materials which are supplied to aircraft and aircraft brake manufacturers for over eighty (80) separate applications. These approvals include some of the largest and some of the smallest aircraft in the world, as well as the workhorse Boeing 727-200.

The aircraft dynamometer used in the Cleveland research department and a list of the aircraft on which Abex products are original equipment components are shown on the next two pages.



THE AR-3 DYNAMOMETER is one of two double ended aircraft dynamometers being used in the Cleveland research department.

AR-2 DYNAMOMETER

1. Capacity — 51 to 3978 pound wheel load.
2. Speed — to 214 mph.
3. Control — Manual
4. Applications — Single rotor aircraft landing brakes.

AR-3 DYNAMOMETER

1. Capacity — 2381 to 18,535 pound wheel load.
2. Speed — To 420 mph.
3. Control — Automatic operation through use of a drum programmer.
4. Applications — Multiple disc aircraft landing brakes.

ORIGINAL EQUIPMENT ON

Commercial Aircraft	Military Aircraft
Convair	DC-7C
Viscount #800	F-105
Convair 880	B-58
707-320C	F-27
Caravelle	A6A
Jet Commander	F4C
Vangard	A7A
Jet Falcon	C-141
Saberliner	A2F-W2F
Beechcraft 95	F8U
727	A3D
D.H. Caribou	A5C
707-320-B	T-38
720	F-111-B, F-111-A
Snow-D.O. 28-P.C. 6	Ov-10A Coin
CH53A	P3B
Piper Commanche	A7D
Beech 18	C5A
Beech 115	T-37
Beech 90	F-100 D, F
CL-215	F4B
L-1011	F5A
	F4J, F4K

Automotive Group

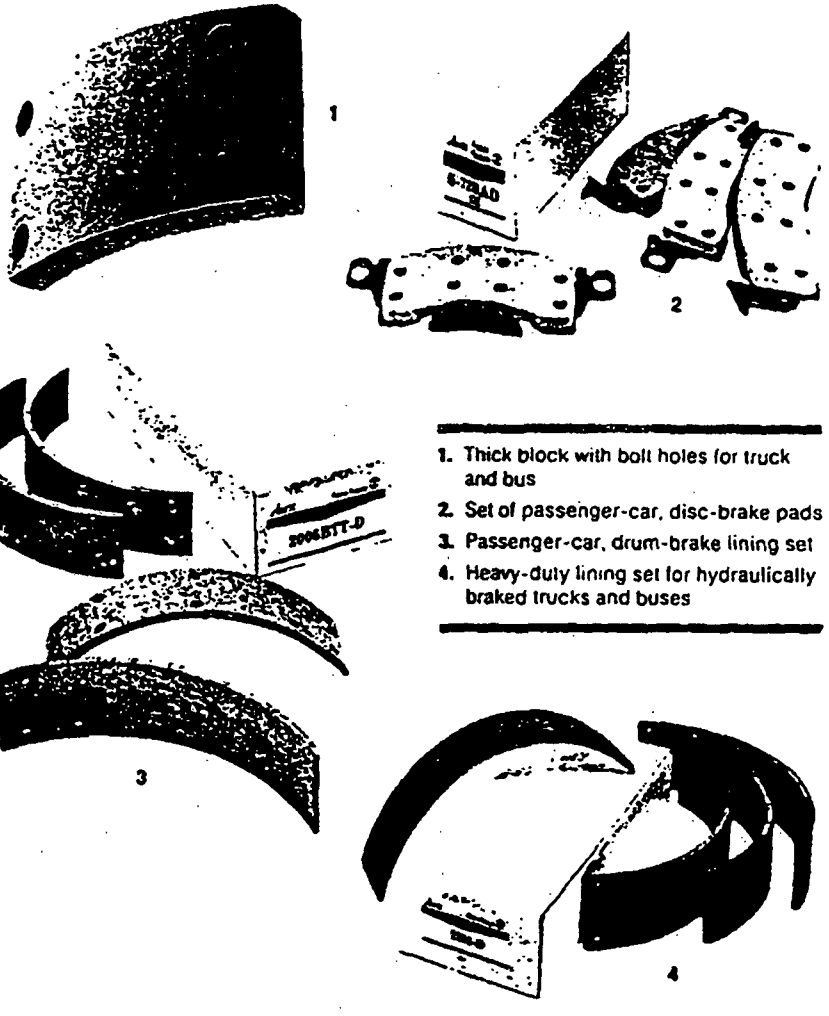
International Affiliates

Country	Name of Affiliate	Relationship	Product
Brazil	COBREQ Companhia Brasileira de Equipamentos Av. Arnolfo Azevedo, 150 01230 Sao Paulo, SP, Brazil	Licensee	Organic brake linings for autos, trucks, buses
Canada	Abex Industries, Ltd. Friction Products Division 50 Colborne Street, E. Lindsay, Ontario, Canada K9V 4R8	Subsidiary	Organic brake linings for autos, trucks, buses
Colombia	COLFRICCION, S.A. Calle 12 #60-24, A.A. 240502 Bogota, Colombia	Licensee	Automotive friction materials
France	Abex Pagid Equipement S.A. 9 rue Klock Clichy, France 92112	Joint Venture	Organic brake linings for autos, trucks, buses and clutch facings
Germany	Abex Pagid Reibbelag GmbH 43 Essen Postfach 58 West Germany	Joint Venture	Organic brake linings for autos, trucks, buses and clutch facings
India	Sundaram-Abex Limited 37 Mount Road Madras 600 006, India	Joint Venture and Licensee	Organic brake linings for autos, trucks, buses
	Hyderabad Asbestos Cement Products Ltd. Sanatnagar Hyderabad 500 018, India	Licensee	Asbestos Yarn Asbestos Fabric Asbestos Jointing Asbestos Millboard
Italy	Frendo Abex S.p.A. Viale Monza 261 20126 Milano, Italy	Joint Venture	Organic brake linings for autos, trucks, buses and clutch facings
	Frendo Abex S.p.A. Orzinuovi, Brescia, Italy	Joint Venture	Sintered metallic friction materials
	Frendo Sud S.p.A. 83100 Avellino (fraz Pianordine), Italy	Joint Venture	Automotive disc brake pads and railroad braking materials

Country	Name of Affiliate	Relationship	Product
Italy	Societa Italiana Per L'Amianto S.p.A. (SIA) Via Latina 391 10096 Leumann, Italy	Subsidiary	Asbestos Yarn Asbestos Fabric Asbestos Jointing Asbestos Millboard
Japan	Mitsubishi-Cement Asbestos Co. Ltd. 24-44 4-chome, Takanawa Minato-ku, Tokyo, Japan	Licensee	Automotive friction materials
Mexico	Abex Industrial S.A. Poniente 128 No. 679 Col. Industrial Vallejo Mexico 16, D.F., Mexico	Subsidiary	Organic brake linings for autos, trucks, buses
Spain	Garnecto, S.A. Calle Alfonso XII 213-215 Badalona (Barcelona), Spain	Licensee	Automotive friction materials
United Kingdom	Sintered Products Limited Hamilton Road Sutton-in-Ashfield Notts, England NG17 5LL	Licensee	Aircraft and resin bonded metallic friction materials

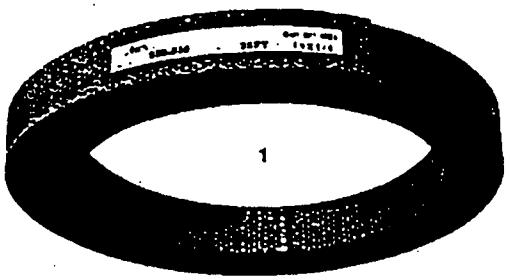
Friction Materials

...for sure stopping power

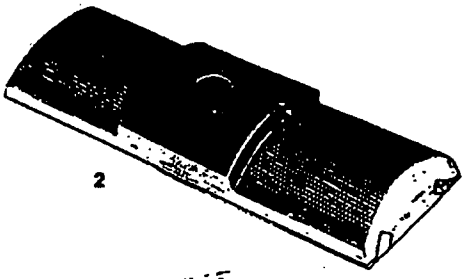


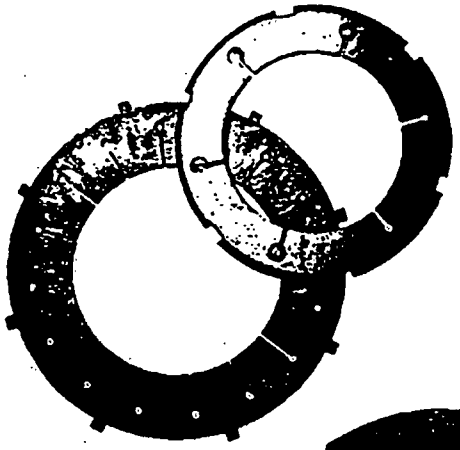
1. Thick block with bolt holes for truck and bus
2. Set of passenger-car, disc-brake pads
3. Passenger-car, drum-brake lining set
4. Heavy-duty lining set for hydraulically braked trucks and buses

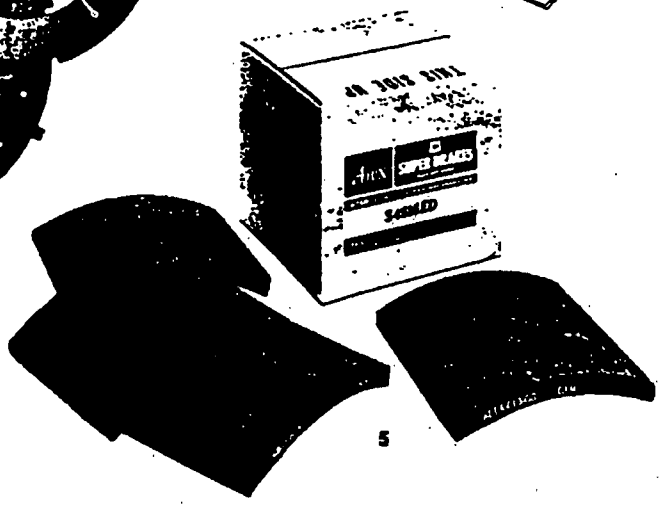
Friction Materials



1. Woven brake lining in roll form
2. Slipper bearing of ABK Material for use in steel mills
3. Sintered metallic discs for aircraft braking
4. Lined shoes for air-brake applications
5. Thick blocks with bolt holes for truck and bus







FRICTION MATERIALS RESEARCH CENTER

Abex world-wide research is headquartered in the Research Center in Mahwah, New Jersey. This group provides a centralized research facility for all of the groups within Abex Corporation. Its most unique features are its Experimental Foundry and the Engineering Test Center.

The Experimental Foundry is a totally self-contained foundry which is capable of producing all types of commercial-size castings from a variety of metals. It is used extensively as a pilot plant facility for many of our metallurgically-oriented divisions and also to produce certain specialized castings for sale.

Our Engineering Test Center is the largest and most complete dynamometer testing facility in the United States. A detailed listing of its testing equipment and its capabilities is included in the brochure on the following 16 pages. Directly associated with this Test Center is an extensive facility for vehicle testing. Both dynamometer and vehicle testing is routinely conducted to evaluate new Abex materials for development and production to ensure that all our materials comply with all government regulations and to qualify our products in accordance with the performance and wear requirements of vehicle and brake manufacturers. Our dynamometer equipment can be programmed to perform any specialized tests required by customers ranging from small disc brake pads for compact cars all the way up to massive brake systems for railroads and complex brakes for aircraft.

In addition to these facilities, we maintain active research in many metallurgical fields as well as in a wide variety of non-destructive testing procedures. Highly sophisticated instrumentation, such as a scanning electron microscope, is used routinely to monitor quality and to assist us in our research efforts to develop new and better performing products.

Although research is headquartered and largely centralized in Mahwah, there are additional R&D facilities for automotive process development at Winchester, Virginia, aircraft sintered metallic linings at Cleveland, Ohio, and a significant product and process development effort in Europe. Our research staff coordinates formula development, process development, and quality control activities throughout the group. It also acts as a reservoir of knowledge and assists in the exchange of technical and developmental data among all members of the Automotive Group.