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- TYPE OF PRODUCTS
- PRODUCTS
- QUALITY CONTROL
- COVER FLANGE-GUIDE



THE COMPANY

INDUSTRIAL PLANT

Company:

SIDEREA S.A.I.C.y A

Location

Roque Saenz Peña 3537 - Lomas del Mirador
Pcia. de Buenos Aires . Argentina.

Products

Composition brakes shoes for railways use
Cover flange guides for composition brakes shoes
Disc-pads for railways disc brakes

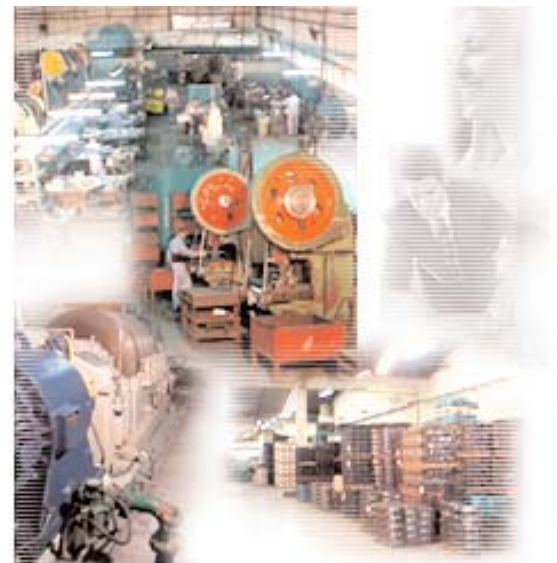
SIDEREA

The company leader in friction material for railway use.

Early in the 70's, **SIDEREA** started her activities offering in those years to the Argentine Railways a new type of Composition Brake Shoe with Low Friction Coefficient and longer useful life, replacing the cast iron ones without requiring adjustments in the steering devices, granting operational economies, and so gradually expanding to other railways abroad.

SIDEREA consolidated the leadership applying in those years concepts for the protection of the environment, producing new compounds 100% free of asbestos and other pollutants, giving rise to the manufacture of the first Composition Brake Shoe with Low Friction Coefficient anti pollutant, with a life span of approximately 8 to 10 times longer than the life span of the cast iron ones, comparing them under the same service conditions.

The proved reduction in the operational costs, obtained using this first ecological Low Friction Brake Shoe





has been extended to medium and high friction compounds, and it has not been surpassed yet by any other composition Brake Shoe. Nowadays the production includes a wide range of models and designs of High, Medium and Low Friction Brake Shoes, and disc brake pads made according to drawings and requirements of more than 80 Railway Administrations of more than 20 different countries, where they are regularly used, offering lower operational costs and guaranteeing safety in train traffic in different services, with complex topographies and even under difficult weather conditions of up to -25C.

Company's Policy:

SIDEREA's policy is to know the user's requirements before selling him, searching for being useful, basing on a wide experience, offering new and sometimes revolutionary solutions, that result in reductions in Operational Costs, through composition compounds which are not abrasive to wheels nor harmful to environment.

Leadership in providing environment and ecology protection:

As it was mentioned before, in the early 1970s **SIDEREA S.A.** won her leadership in the industry of friction material for railway use, as she was the first manufacturer in the continent producing composition brake shoes free of asbestos and other pollutants of rails and environment, putting on the market the first environmentally friendly brake shoes.

Leadership in operational costs reduction:

SIDEREA is also a leader in generating economies for users, achieving a proved reduction in the operational costs, offering a brake shoe with an exceptional and still not surpassed long lasting life span, which is as minimum twice longer compared to that of similar products.

SIDEREA's brake shoes are different from the conventional ones. They are made of severely selected raw material. Using a new manufacture methodology, compounds of lower abrasion and great performance are achieved. It is verified through the cost/ benefit concept.

TYPE OF PRODUCTS



Friction Material:

- Low, Medium and High Friction Brake shoes for railway use.
- Low, Medium and High Friction Disk Brake Shoes for railway use.

Anti -Friction Material:

- Cover Flange Guides for Composition Brake Shoes.





PRODUCTS

OUR BRAKE SHOES:

SIDEREA's brake shoes have been operating in all weathers and latitudes for more than 30 years, in trains that operate in areas with very cold winters, with temperatures lower than -25C, (Andean highlands) or areas with complex topographies, with slopes of (3.2% up to 6.05%).

They are also used in super ore freight trains with more than 200 wagons of 110/ 130 Tons each, under hot and humid weather conditions, or in urban, suburban and long distance railway services.

We have more than 30 years of wide experience in the development, manufacture and use of Composition Brake Shoes for railway use. We are the suitable Company to reduce costs in railway braking.

SIDEREA produces a wide range of designs and models of brake shoes, fulfilling the requirements of electric and trailer coaches, yard and road locomotives , and all types of wagons, what makes possible to equip each vehicle with the appropriate design of brake shoe. .

Technical Advice:

SIDEREA's technicians, specially the ones working in the After-Sales Service Department, are in permanent contact with the users of our brake shoes, directly or through our representatives in each country.

High medium and low friction coefficient shoe



Disk brake pads





Brake shoe with cover flange guide



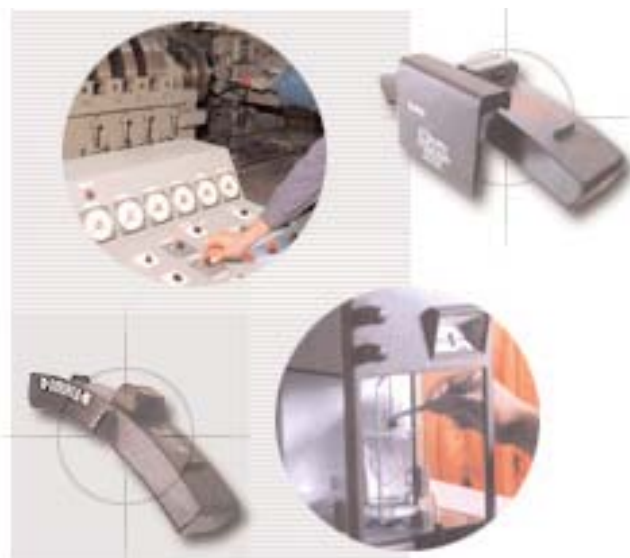
Development of the unique composition brake shoe with “removable” cover flange, making possible the line up of the brake shoe on the tread band, without altering the weight/ brake ratio on the vehicle, without risking the wheel integrity. This revolutionary solution has not been surpassed yet by any other equivalent product.

QUALITY CONTROL

FRICITION TEST LABORATORY:

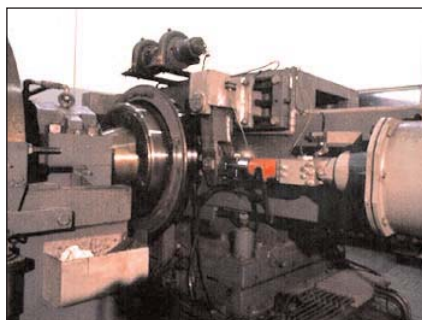
SIDEREA's laboratory is equipped with modern and specialized equipments in order to carry out the chemical analysis of the raw material that enters the plant and also control the physical, mechanical, dynamic and frictional properties of the brake shoes in process and the final product.

SIDEREA's laboratory issues the Quality Certificate, which is dispatched along with every batch that goes out of factory. The Quality Certificate shows the series number, date of manufacture and other technical data arising from the tests performed as per standards.



Physical, Chemical and Dimensional Analysis:

The raw material is controlled before being stocked. A verification of the required values is carried out on every lot before entering the plant in order to give it a production series number.



Physical and Mechanical properties:

Taking the Brake Shoes from the series in production, the following can be controlled:

- Adhesion of the compound to the backing plate
- Rockwell “L” hardness (cross breaking strength)
- Specific gravity
- Bending strength



e) Compressive strength

f) Impact strength

g) Thermal resistance

These are the efforts supported by the brake shoe on braking.

The test pieces are cut as per diagram showed in the specifications.

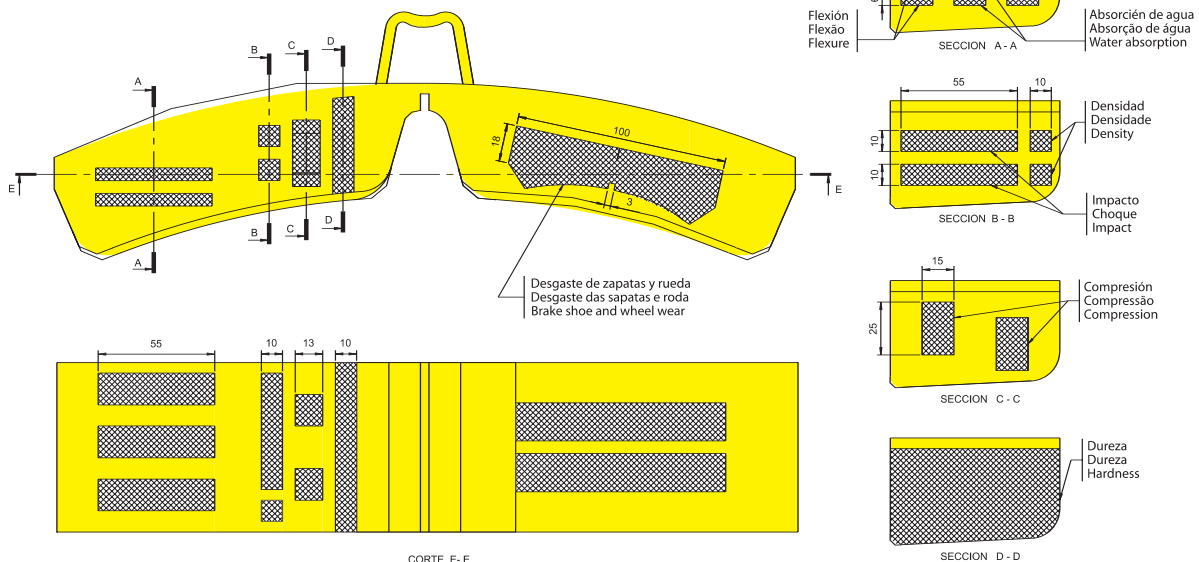
Please note the test pieces cutting diagram

Test Pieces Cutting Diagram



NORMA IRAM - FA L 134 - 86

EXTRACCIÓN DE PROBETAS PARA ENSAYOS
ZAPATAS DE FRENO CON ESPESORES MEDIOS DE 40 - 50 mm
EXTRAÇÃO DE CORPOS DE PROVA PARA ENSAIOS
SAPATAS DE FREIO COM ESPESURA MEDIA: 40 - 50 mm
EXTRACTION OF THE TEST SPECIMENS
BRAKE SHOES WITH 40 - 50 mm AVERAGE THICKNESS



LABORATORY OF FRICTION AND DYNAMIC TESTS

Laboratory test

SIDEREA has got two dynamometers:

a) Dynamometer in natural scale (Scale 1:1)

- It is a machine to carry out stop tests in natural scale.
- It operates at a maximum speed of up to 240 Km/h.
- It meets the requirements established in the railway standards.
- Several types of test can be performed in it.
- The most usual test is the "stop test" (inertial test) in order to verify the below mentioned parameters.
- Other type of test is the gradient test.
- The axle load, the range of speed and braking forces (under service and emergency conditions) are modified as per
- values required in standards.





- The parameters controlled in the stop test are the following:
 - Friction coefficient, instantaneous and average values achieved applying brakes at different speeds under service and emergency conditions.
 - Distance and time up to stop.
 - Temperature in wheels and brake shoes on braking.
 - Brake Shoes wear during the test
 - Verification of the brake shoe behaviour under wet conditions, carried out in the Dynamometer.
 - Capacity of brake in gradient tests.

b) Dynamometer in 1:20 scale

SIDEREA uses this dynamometer in different types of test, especially in the test of 2000 consecutive brake cycles (one per minute, approx. during 33 hours) just to evaluate the abrasion on the wheel. This test is performed on samples taken from every production series.

It enables the measurement of the brake shoe wear in mm /braking and the evaluation of the abrasion caused by the compound on the wheel or tread band (only for braking effect).

Having this information, the tread band recovery cost, variable depending on the friction material grade used, could be evaluated. Excellent information can be obtained from the tests carried out in this dynamometer under wet conditions. The friction coefficient, distance and time up to stop, applying brakes at different speeds under service and emergency conditions, can also be measured.

Brake shoes in scale are used in this dynamometer. They are cut from the internal part of the brake shoes taken from production. The brake shoe wear is measured by loss of weight and is expressed in mm /braking. Please note the test pieces cutting diagram

A wheel in scale is used. Once finished the test, the levels of abrasion on the tread band are appreciated and the wheel wear is measured by difference of weight. The test enables us to evaluate the tread band recovery cost. The results are expressed in mm /braking.

Quality Certificate:

The Quality Certificate is signed by the specialized professional and is dispatched along with the consignment. The results obtained from the tests performed in the laboratory using the brake shoes corresponding to the series to be consigned, are detailed in the Quality Certificate. The values registered in the tests of Physical, Dynamic and Frictional Properties, including friction coefficient and brake shoe and wheel wear tests valid for the batches to be consigned, are informed there.

COVER FLANGE GUIDE

- Solution for the line up of Brake Shoes on the tread band
- The importance of a correct line up
- Ways of avoiding the effects of wear in articulated steering devices

BACKGROUND

The problem of an incorrect line up of the brake shoes is shown up in vehicles with articulated and/ or hanging steering devices.

Due to bushings and pins wear, the brake shoes take an incorrect position leaning out of the tread band, what increases maintenance costs and reduces services frequency in vehicles like locomotives, electric coaches,





trailers and other vehicles of intensive services.

The magnitude of an incorrect line up varies depending on the design of the steering device used. Sometimes it may go from few millimetres up to a leaning of the brake shoe partially out of the wheel, what means a reduction of the friction area, resulting in a reduction of the capacity of retardation and early damage on braking steering, increasing the incorrect line up and the maintenance costs. The most critical situation is generated when the brake shoes operate on the edge or partially out of the wheel. In the latter case the friction area is reduced, thus requesting more net breaking force and generating undesired mechanical and thermal over-efforts on the edge of the wheel, wasting material and so increasing the removal of brake shoes and the frequency of maintenance.



See brake shoe operating on the tread band, using cover-flange guide

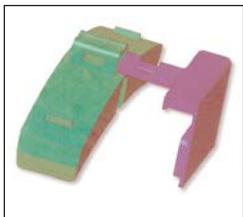


See brake shoe operating on the edge or partially out of the wheel.

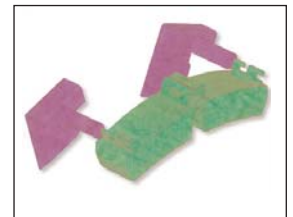
COVER-FLANGE

The Cover Flange Guide offered by **SIDEREA** is a “removable device” that can be easily installed along with the standard **SIDEREA** brake shoe in its working position, without any accessories requested

Double cover



Simple Cover



IN THE SEARCH OF A SOLUTION

Several manufacturers have been searching for solutions in order to solve or at least attenuate the problems of a defective line up. Several alternatives were offered, some of them coping the model of the cast iron shoe with flange, welding the backing plates of two composition brake shoes parallel and making a cavity for the wheel flange, others moulding an unified piece covering the flange with friction compound but none of them succeeded in finding a solution to the problem of the defective line up.

The solution offered by **SIDEREA** and its advantages

Having **SIDEREA** developed the **COVER FLANGE GUIDE**; the final solution arrived, guaranteeing the correct and safe line up of the brake shoe on the tread band. Its patented design takes on a steel plate a moulded block of an anti-friction 100% ecologic compound, which acts as a sliding element without collaborating in the braking action or producing any undesired thermal effects on the wheel.

This solution proved to be the most effective one, both as regards the technical as well as the economic



aspect. On braking, the anti-friction block acts as a guide when it slides leaning against the inner face of the wheel, under the tread band edge, (outer face of the flange). See figure (A)

Its low friction rate makes the sliding easier and does not produce any undesired thermal effects or abnormal wear outs, guaranteeing the correct position of the brake shoe on the wheel. If the brake shoes are correctly lined up, they operate leaning their complete surface on the tread band, obtaining so the specific pressure on the wheel, within the limits of the vehicle design. The historical data and the accumulated experience enable us to guarantee that this guide has a rated minimum useful life equivalent to the useful life of two or three composite brake shoes.

The Cover Flange Guide offered by **SIDEREA** is a “removable device” that can be easily installed along with the standard **SIDEREA** brake shoe in its working position, without any accessories requested. The Cover Flange Guide is a device independent from the brake shoe and it is very economical. Depending on the braking material wear, the cover flange guide or the brake shoe can be replaced independently. Using the cover flange guide, all the troubles generated due to the incorrect line up in the steering devices are solved, friction material waste is avoided and longer useful life to the brake shoes and steering devices is provided, solving the premature wear of bushings and pins. Using the cover flange guide as a preventive element, the useful life of the steering devices that were just repaired and the time of availability of vehicles can be enlarged

Advantages of using the cover flange guide for brake shoes

- Line up and total contact between the brake shoe and the tread band
- Safe and efficient breaking action.
- Longer useful life for brake shoes.
- Reduction in costs regarding change of brake shoes
- Reduction in costs regarding maintenance of steering devices
- Direct fitting through the key (pin, switch blade, wedge, etc.)* using **SIDEREA**'s brake shoes.
- Easy instalment, no accessories required
- No modifications on the steering devices requested
- Higher availability of vehicles, reducing the frequency of maintenance
- Especially useful in vehicles with hanging articulated steering devices, such as locomotives, trailers, electric coaches, etc.

* Usual railroad names given in different Spanish-American countries.





ZAPATAS DE FRENO - BRAKE SHOES - SAPATAS DE FREIO



ZAPATAS DE FRENO - BRAKE SHOES - SAPATAS DE FREIO