INDUSTRIAL
RUBBER
WHAT IT MEANS TO YOU

BY

S. V. LATHIA

B. Sc. (Hons), L.I.R.I. (London) J.P.

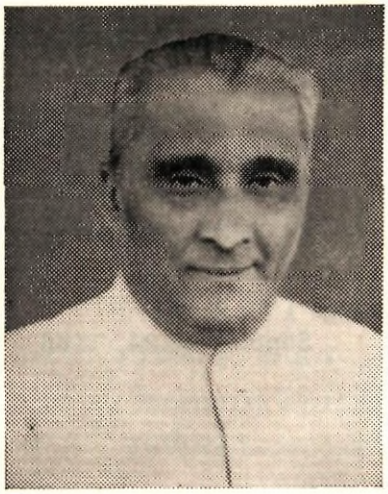
PUBLISHED BY:

INDUSTRIAL SUPPLIES CORPORATION

Manufacturers of Industrial Rollers and Rubber Lining

SAKINAKA, KURLA-ANDHERI ROAD, BOMBAY-72 (AS)

PHONE: 51530, 55630, 55670 GRAM: UCANRELY



(Hon. Shri S. K. Patil,
Union Minister for Railways
Govt. of India)

Hon. Shri. S. K. Patil, Union Minister for Railways, Govt. of India has kindly consented to perform the opening of the factory extension on Sunday, 23rd October, 1966, at 11 a. m. at Sakinaka, Kurla Andheri Road, Bombay–72 (AS).

(Shri G. L. Mehta)
Chairman, I. C. I. C. I.

Shri. G. L. Mehta, Chairman of Industrial Credit & Investment Corporation of India Ltd., has kindly consented to grace the occasion and address the gathering.

उपराष्ट्रपति, भारत
नई देहली
VICE-PRESIDENT
INDIA
NEW DELHI

September 24, 1966.

Dear Shri Lathia,

Thank you for your letter of the 20th instant. I am glad to know that the opening of your factory extension will be performed by Shri S. K. Patil on the 23rd October. I send my best wishes for the success of the function.

Yours sincerely,

Zakir Hussain

Shri S. V. Lathia,
'Sambhav', Block No. 10,
Plot No. 41, King's Circle,
Bombay 19, DD.

SINGAPORE POLYTECHNIC

PRINCIPAL: A. ROBERT EDIS. B. ENG., M.I. MECH. E., M.E.I.C., M.I.NUC.E., A.F.C.A.S.I., M.I.E(M)

TELEGRAMS: POLYTECH. SINGAPORE
TELEPHONE: 71873

PRINCE EDWARD ROAD.
SINGAPORE, 2.
(P. O. BOX 2023)

4 October, 1966

IT IS A SOURCE OF GREAT PLEASURE TO LEARN FROM MY OLD STUDENT, Mr S.V. LATHIA, B.Sc.(Hons), L.I.R.I., J.P., OF THE INDUSTRIAL SUPPLIES CORPORATION, THAT THE FINAL PHASE OF HIS FACTORY EXTENSION WILL BE OFFICIALLY OPENED BY THE HON. SHRI S.K. PATIL, UNION MINISTER FOR RAILWAYS, GOVERNMENT OF INDIA, AT 11 A.M. 23 OCTOBER, 1966.

THERE IS SOMETHING PARTICULARLY SATISFYING IN WATCHING THE DEVELOPMENT OF A MAN WITH WHOSE EARLY TECHNOLOGICAL TRAINING ONE HAS BEEN ASSOCIATED. Mr LATHIA HAS TAKEN FULL ADVANTAGE OF EVERY OPPORTUNITY THAT HAS COME HIS WAY. I AM PROUD TO WISH HIM, HIS ORGANISATION AND COLLEAGUES, EVERY BLESSING IN THE PROMISING YEARS AHEAD.

F.H. Cotton

F.H. COTTON
Ph.D., M.Sc., F.R.I.C., F.I.R.I.
Principal Lecturer
(Formerly: Head,
National College of Rubber Technology,
LONDON N.7, England.)

FHC/SKY.

Some of the messages of Blessings & Success received on this occasion

GOVERNOR OF MAHARASHTRA
सत्यमेव जयते

RAJ BHAVAN.
BOMBAY.
September 28, 1966.

I am glad to hear that the Industrial Supplies Corporation's factory extension will be formally opened by the Hon'ble Shri S.K.Patil on the 23rd October. I congratulate the Corporation on this extension and wish it every success in the future.

I have great pleasure in sending this message.

P. V. Cherian.

गृह मंत्री, भारत
HOME MINISTER
INDIA

New Delhi
October 10, 1966.

MESSAGE

I have noted with interest that industrial Supplies Corporation of Bombay have completed extensions to their factory and would soon enlarge their production.

It is indeed heartening to get news about our progress towards greater industrialisation. Particularly thrilling is the news of things being done within the country for the first time; thus reducing our economic dependence on advanced countries.

I am very happy to note that the Industrial Supplies Corporation is contributing its mite to the realisation of these national objectives.

My good wishes on the occasion of the inauguration of the extension.

G.L. Nanda

(G.L. Nanda)

MINISTER OF DEFENCE

New Delhi,

28th September 1966

I am glad to know that the opening of the factory extension of Industrial Supplies Corporation will be held on 23rd October this year. On this occasion, I send my best wishes to the management and staff of the Corporation.

(Y.B. Chavan)

योजना एवं समाज कल्याण मन्त्री
भारत
MINISTER OF
PLANNING AND SOCIAL WELFARE
INDIA

5th October, 1966.

MESSAGE

I learn with interest that the factory of the Industrial Supplies Corporation, Bombay will be opening an extension to the existing factory on October 23, 1966.

It is encouraging to note that this organisation prides itself on the fact that it has drawn its key personnel from the younger age group and they have not hesitated to venture into a new and challenging field. What we need most today is to develop the ability to improvise and innovate in the context of limited resources. Such efforts deserve to be stimulated and encouraged.

Asoka Mehta

D.O. No. 1365-CM/66

GOVERNMENT OF INDIA
MINISTER OF COMMERCE

New Delhi, October 8, 1966.

Dear Shri Lathia,

I am glad to learn that in your existing factory at Bombay you would be undertaking the production of rubber blankets for Sanforising machines.

At present there is no organised production of these blankets and that the country's requirements are being met by imports. I am glad to note that you are undertaking the production of this item in your factory with the existing machinery, using raw materials which are indigenously available and without any foreign 'know-how'. I trust that the blankets you produce would be of satisfactory quality and that you would be able to market them at reasonable prices. These two factors are important to induce the users of these blankets to switch over to the indigenous material quickly. I appreciate that your new venture has all the potentialities for not only saving foreign exchange but also earning it by exports.

I am very happy to send my good wishes on the occasion of the opening ceremony and wish your venture all success.

Yours sincerely,

Manubhai Shah
(Manubhai Shah)

Shri S.V. Lathia,
Industrial Supplies Corporation,
Sakinaka, Kurla, Andheri Road,
BOMBAY-70.

सत्यमेव जयते

GOVERNMENT OF INDIA,
MINISTER OF INDUSTRY
Camp. Lake View State Guest House,
Hyderabad.
27th September, 1966.

Dear Shri Lathia,

Thank you for your letter dated 20th September, 1966. I am happy to know that my esteemed colleague, Shri S.K. Patil, will be performing the opening of your factory extension. I wish you and the workmen in your factory all the best in the coming years.

Yours sincerely,

(D. SANJIVAYYA)

Shri S.V. Lathia,
Rubber Technologist,
Industrial Supplies Corporation,
Sakinaka, Kurla,
Andheri Road, BOMBAY-70.

HAPPY ANNOUNCEMENTS.....

THE MANAGEMENT HAS PLEASURE TO ANNOUNCE, THAT THEY HAVE COMMENCED MANUFACTURING RUBBER BLANKETS AS USED ON CLUETT-APPROVED AND CONTROLLED SHRINKING RANGES. THIS ITEM IS VERY COMPLICATED AND IS CURRENTLY BEING MANUFACTURED BY ONLY FEW MANUFACTURERS THROUGHOUT THE WORLD.

WE HAVE PLEASURE IN INFORMING OUR VALUABLE CLIENTS, THAT THE FIRST RUBBER BLANKET MANUFACTURED BY US IS NOW UNDER TRIAL AND IF SUCCESSFUL, WE HOPE TO MEET THE ENTIRE REQUIREMENTS OF THE COUNTRY, AS WELL AS EXPORT THIS ITEM, IN THE NOT TOO DISTANT FUTURE.

WE ARE THANKFUL TO THE SANFORIZED COMPANY FOR CO-OPERATION AND ASSISTANCE RENDERED ON THIS PROJECT.

INDUSTRIAL SUPPLIES CORPORATION have great pleasure in presenting this booklet at the time of inauguration of the final extension of their factory premises at Sakinaka, Kurla-Andheri Road, Bombay-72(AS) on Sunday the 23rd October, 1966, at 11 A. M.

We were fortunate enough that Hon. Shri S. K. Patil had been kind enough to perform the opening ceremony of our new factory on 17th May, 1959.

It was a matter of satisfaction that the function was well attended by large number of clients, well wishers and friends who have helped us to achieve this result.

INDUSTRIAL SUPPLIES CORPORATION is thankful to Hon. Shri S. K. Patil who has been very kind to us and we are grateful to him for his kind blessings.

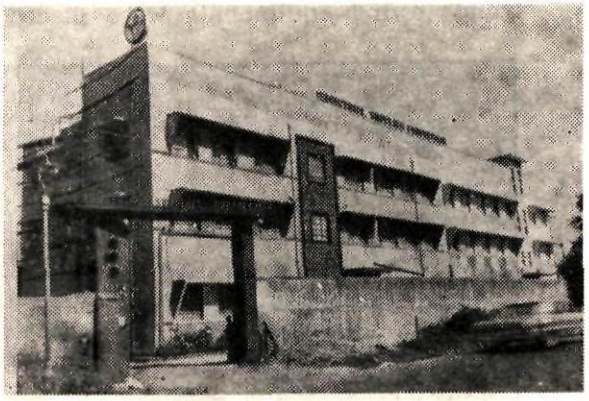
Hon. Shri S. K. Patil, Union Minister for Railways, Government of India, has kindly consented to inaugurate the final extension of our factory. Shri G. L. Mehta, Chairman of I C.I.C.I. has kindly agreed to grace the occasion and to address the gathering.

We have pleasure to announce that our new Imported Automatic Calender Machine 610 dia x 1700 mm will be put into operation by Hon. Shri S. K. Patil on 23rd October, 1966. This imported Calender Machine is one of the largest calenders in our country and we are fortunate enough to equip our factory with this machine. It is our earnest desire to serve our Nation with our quality products in better way and we will also do our best to extend fullest services to our reputed clients.

(PHOTOGRAPH OF OUR LAMINGTON ROAD FACTORY)

The place from where we have Started on 15–8–1953.

(PHOTOGRAPH OF OUR SAKINAKA FACTORY)



What we are Now at Sakinaka.

OUR FUTURE ? *Depends on your valued co-operation*

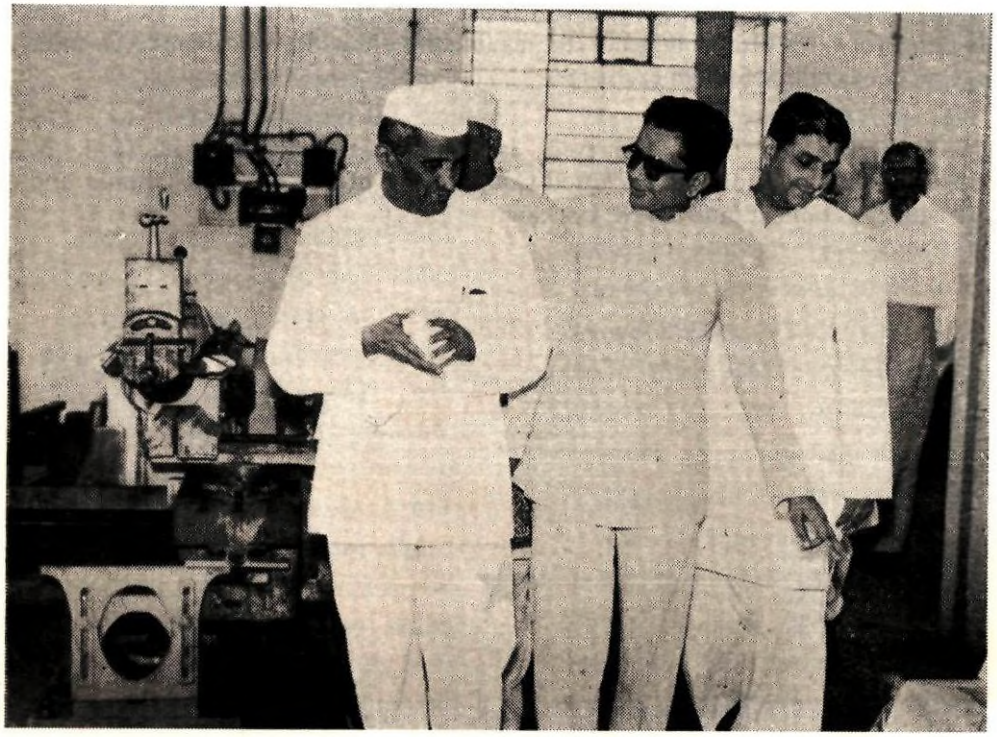
A SHORT HISTORY OF I.S.C.

INDUSTRIAL SUPPLIES CORPORATION was started in 1953. The factory was started with old machineries for manufacturing Rubber ebonite rollers. The factory was started at Lamington Road on 15th August, 1953, with only a capital of a few thousand rupees. Slowly and steadily manufacture of new rollers, rubber-lining of Tanks, and moulded articles were added. In 1957 the whole lot of machineries belonging to M/s. Modern Rubber Mfg. (J. K. Group of industries) was purchased and incorporated in the factory. In 1957 we have started the production of Moulded articles, Rubber bags (Hot Water Rubber bottles). In 1958 new land for our new factory was purchased and order for new machineries and testing equipments were placed in foreign countries. We were

Photograph Showing : Hon. Shri S. K. Patil Addressing the Gathering at the time of Opening of our Factory on 17th May 1959.

lucky enough to have our new factory inaugurated by Hon. Shri S. K. Patil.

Slowly and steadily after 1959 we have added large number of machineries imported as well as obtained in India. To-day it is a matter of satisfaction for us that we are one of the leading manufacturers of Industrial Rubber articles and our factory is well equipped with all modern machineries as well as modern testing equipments in our Laboratory to have better quality control in 1962, we started our Rubber-lining division. In 1965, we added more imported machines in order to have fully equipped factory to cater for the growing need of the country.



Hon. Shri PATIL SAHEB Taking keen interest during his visit to our factory on 17th May 1959.

We have made steady progress and whatever we have achieved is only due to the kind co-operation of our large number of well wishers, friends, patrons, valued clients who have always given us their full support. This year we have installed Big Calender Machine which costs us about half a million rupees. By the grace of God we have achieved very good result due to the kind co-operation of our valued clients. It is our earnest desire to help our clients and also to extend our best services to them. It is also a matter of satisfaction that we are supplying our rubber products throughout India and we have got more than 800 clients out of them 70% are regularly placing their open orders and we always try our best to maintain trust and faith entrusted by our valued clients.

We are also fortunate enough that the final extension is being inaugurated by Hon. Shri S. K. Patil. This year we intend to manufacture Rubber Blankets as used on Cluett-approved and controlled shrinkage ranges. This blanket is manufactured by a very few firms in the whole world and we are looking forward with confidence to manufacture this Rubber Blanket in India saving considerable foreign exchange.

Whatever we have achieved is due to the Grace of God, by the Blessings of Elders, by Valued Cooperation of Friends and Clients and by sincere, honest and hard working.

Dear Sir,

I know you will be interested in knowing what we have been able to achieve because of your valued co-operation and patronage in the past.

This little booklet which I am enclosing tells you about the story. It is certainly a story of progress and matter of satisfaction. Satisfaction more to you than to us because without your assistance such a progressive result would never have been achieved. It is only 13 years ago we sought your support and within the period of 13 years it is our good fortune that we are able to assure you that we are the kind of an enterprise which you always wanted us to become; in the matter of quality and in the matter of service.

At the time of commencing our new factory, on 17th May 1959, we have prayed ourselves to give us courage and your valued support so that we might be able to serve you and other concerns to the entire satisfaction. It was a matter of great satisfaction that after opening our new factory, I was fortunate enough to visit the Continent, U.S.A., Japan, for 4 times to study the latest technical development in Rubber rollers and rubber lining and also to place various orders for the modern machineries. We have made our factory fully modern and automatic. Whatever result is achieved is only due to the valued support and co-operation extended from your end.

We are also arranging at the time of opening a exhibition of our products. An inspection of the same will convince you of the technological ability which has been responsible for such a diversification of our production. This technological ability as you will see from the modern factory is ably assisted by a fully equipped Laboratory and testing equipments.

It is our proud privilege to inform at this time that we must have manufactured more than a million rollers. Rubber rollers and Rubber-lining are very complicated items and all products manufactured by us are supplied under guarantee of one year during which period if any-

thing goes wrong due to defective manufacture or defective materials used, the products are rectified free of cost. It will convince you about the confidence which we are enjoying for our products. We are very versatile in our manufacturing activities and we always believe to tackle impossible problems and difficult tasks with your co-operation.

I would like to add here that I had visited 1000 industries in India including most of the textile mills, paper industries, rayon industries and chemical and other industries. I have also visited more than 100 factories in foreign countries manufacturing Rubber rollers and rubber lining, Laboratories and Textile machinery manufacturers. We are fortunate to get sound experience as well as technical know-how and it is our earnest desire to meet all the requirements of our clients in best possible way.

I have already requested you to attend the inauguration ceremony of our final extension by sending you invitation card. I am requesting you once again with this booklet to grace the occasion as to have you with us at the time of inauguration of the final extension would certainly add to our pleasure.

Looking forward to have you with us at the inauguration ceremony.

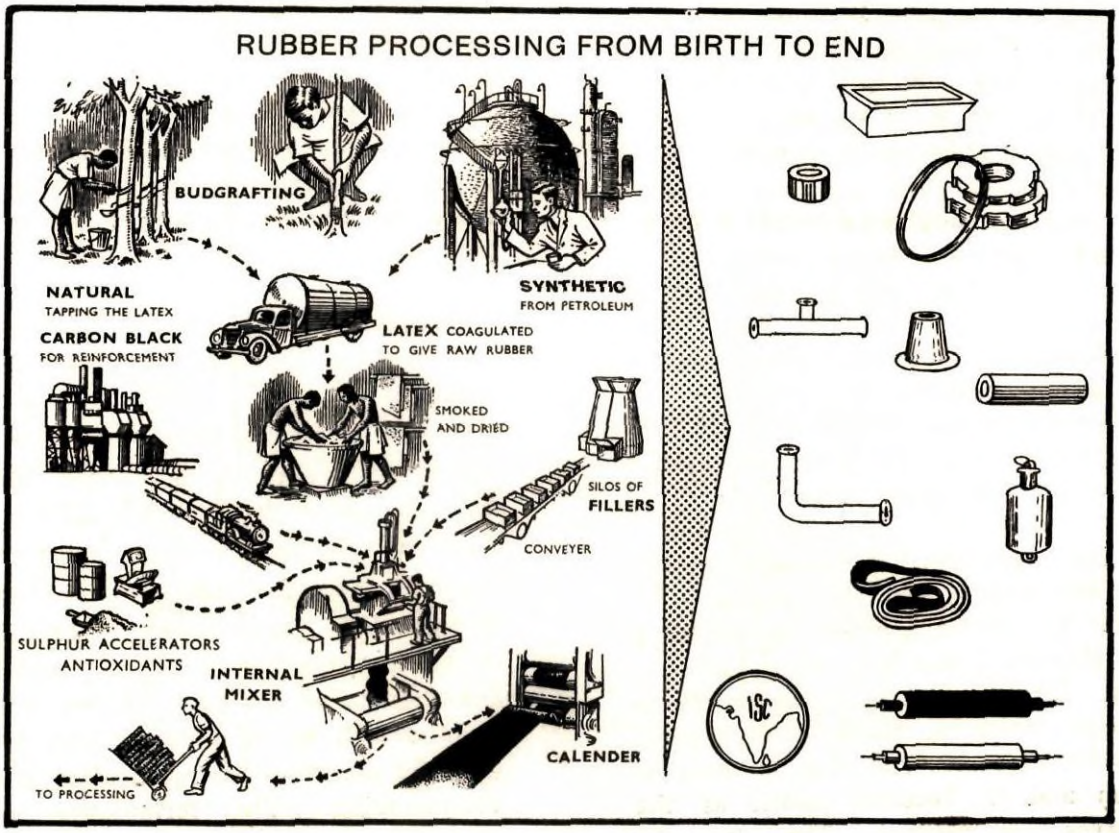
Yours sincerely,

S. V. LATHIA

INDUSTRIAL RUBBER WHAT IT MEANS TO YOU

RUBBER TECHNOLOGY:— Rubber is common household word used since more than a few centuries. It is obtained from the milky juice of many plants known as latex. The drawings give an illustration of stages in rubber production and processing together with a few of the many articles manufactured by us from Rubber.

Most of the latex tapped is from the soft inner bark of a common plant known as Hevea Brasiliensis. Latex is coagulated with acid, usually in vats. The junket like coagulum is passed



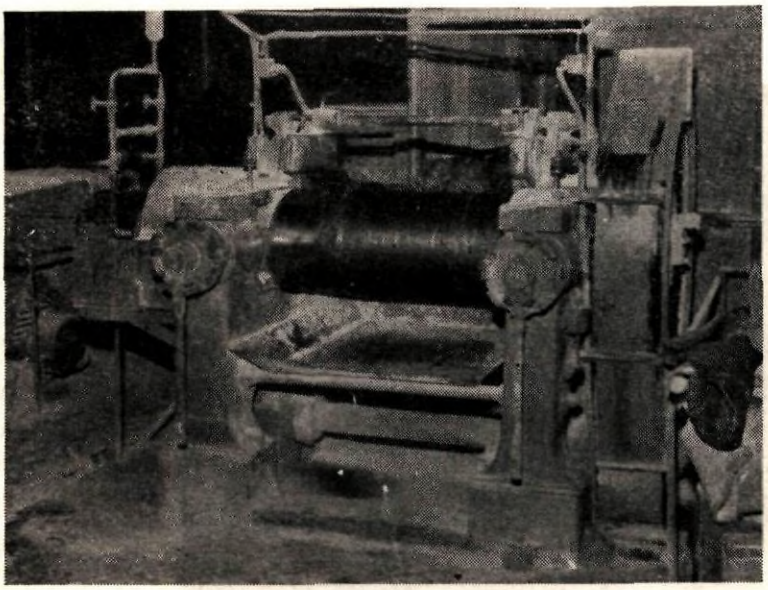
between rollers to squeeze out most of the residual serum, leaving a tough white sheet which after drying becomes a pale crepe (which is very commonly noticed with shoes) or smoked sheet if the drying is done in a smoke-house. The yield of rubber has increased recently by the method of bud-grafting in plantation.

Synthetic rubber of many types are the rubbers made by man from various chemical compounds. Synthetic Rubbers are produced in U.S.A., U.K., Russia and Germany. Recently we have also installed a plant in Bareily where Styrene Type rubber is manufactured. Most of Synthetic rubbers are manufactured from petroleum products, alcohol and acetylene. Mostly all begin as an aqeous emulsion of the parent compond, whose molecules are induced to link and lengthen within microscopic drops by the method of polymerisation. These drops remain as minute particles of rubber in milky dispersion which is known as Synthetic latex. Synthetic Rubber is produced out of Synthetic latex

The first step in manufacture of rubber articles from raw-rubber whether natural of synthetic is to knead it between iron rollers or enclosed rotors. This process is known as mastication which is similar to chewing. Rubber becomes soft due to mastication and it becomes plastic as the nerves are reduced. Thereafter the soft rubber will readily absorb fillers and necessary chemicals such as Clay, Lithopone, Zinc Oxide, Titanium Dioxide, Carbon Black, Stearic Acid, Antioxidants and Accelerators, Plasticizers, Softeners, Paraffin Wax are added to compound of the rubber to meet the exact service condition. A small quantity of chemicals known as anti-oxidants are added to prevent the oxidation together with organic accelerators which accelerates the vulcanisation. Zinc Oxide and Stearic Acid activate and assist the action of accelerators. Carbon Black and silica fillers are also added in the mix to obtain the desired reinforcement. Sulphur which is an essential chemical for vulcanisation is added at the end very carefully. There are more than 400 chemicals available from which the selection is made.

The compounding of rubber is an art and rubber technologist produces a desired compound at a competitive rate to meet the service condition. In our factory we are using more than 1000 formulae and each formula is different from the other as all the formulae are based to meet the exact service condition. The compounded rubber is made into thin sheets, further cooled and then taken for use. Mixing Mill or internal mixer of Banbury type are essential machines for mastication and compounding. The formulation of rubber compounding of mix will de-

Our Modern Lathe–Dept. (Call Imported Lathes.)



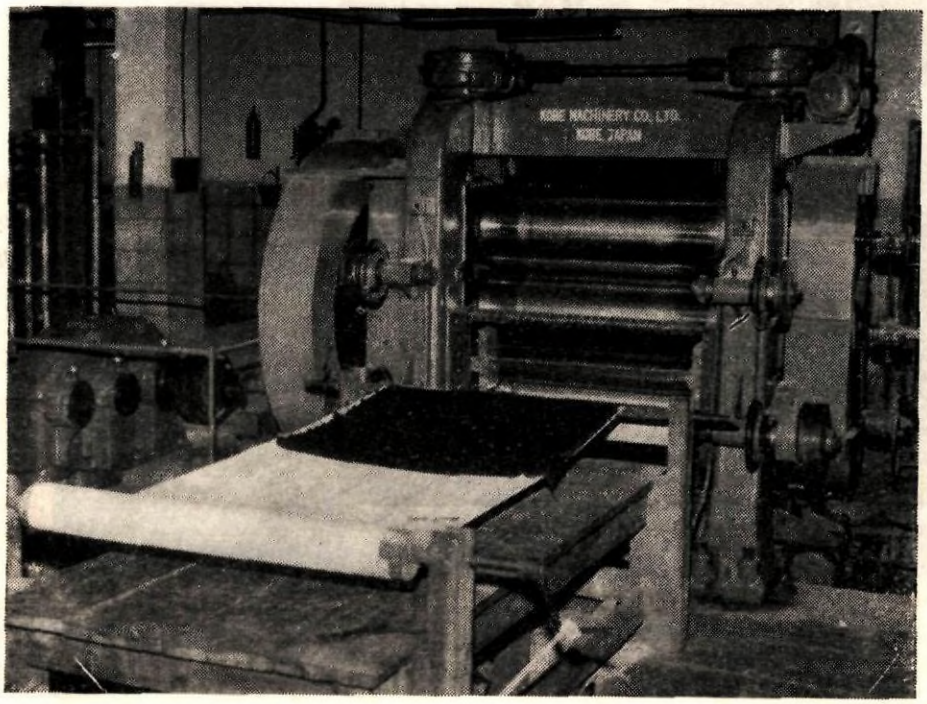
Photograph of Mixing Mill Showing Mastication of Rubber & Compounding

pend on the requirement and it is similar to the Doctor's prescription for using the various ingredients in the mix.

The most important machinery for rubber industry is calender machine Some of the manufacturers avoid this process of calendering in order to save the cost but for a quality manufacturer calender is very essential machine and it is difficult to take up quality product without calender. Calender is a precision machine to make fine sheets or coated fabric with rubber. In our case we are using all thin sheets and desired thickness is built up from calendered sheets. By taking thin sheets from the calender, it can be ensured that there is no defect such as air bubbles, blisters etc. as thin sheets of 1.5 mm. thick is checked thoroughly before application.

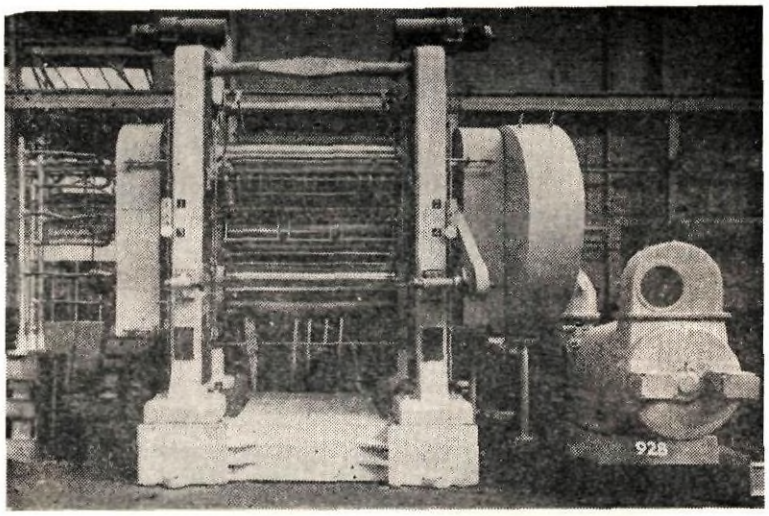
In the moulding department compounded rubber is pressed between mating steel dies in whose cavities it is simultaneously shaped due to flow of rubber by action of heat and vulcanised under pressure and heat so that it may emerge as finished products such rubber bag, ebonite articles and rubber-bushes. Presses are used for vulcanisation for moulding.

In case of rubber rollers we are also

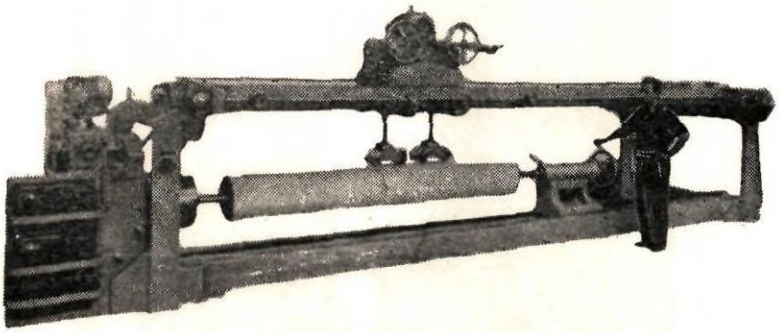


Small Calender Showing Taking Thin Sheets

differing in basic process with most of the other manufacturers. It is our practice that whenever we get old rollers for refilling, we are completely scrapping the old rubber, new threads are taken out throughout the shell to increase the surface area and then they are sent for sandblasting to clean the metal surface. After sandblasting, the rollers are cleaned with chemical and petrol to remove any impurities and then they are coated with special layer of chemical bonding agents to obtain



Photograph of Imported New Calender Machine



Size : 650 mm x 6000 mm *length.*
Photograph of Automtaic Roll Production Machine for Application of Rubber Sheets & Wrapping of Thin Rubber Sheets Under Pressure.

desired bonding strength between metal and rubber. It is difficult to get desired bonding strength between metal and rubber if proper care is not taken. In our case we are able to get perfect bonding as we do the job on scientific principles. After application of bonding agents, the rubber is applied in thin layer and desired thickness is built up by calender sheets on automatic roller Production Machine and in the same machine the rollers are wrapped under pressure by tape or newar.

After building of the roller the roller goes to the vulcaniser. The steam is given from 8 hours to 100 hours depending on the size of the roller, weight of the roller, diameter of the roller and thickness and hardness of rubber.

Showing binding operation of Rollers.

Big vulcanisers are used for vulcanisation of rollers as well as for rubber lining of vassels. After the rollers are vulcanised, the rollers are allowed to cool down to normal temperature and they are finished on Automatic Roll Grinding Machines. We are much more advanced than most of the manufacturers as all our rollers are finished on imported precision and automatic Dronsfield Roll Grinding Machine. These machines are very costly but they do precision job as ultimate result of the rollers will depend on the finishing of rollers.

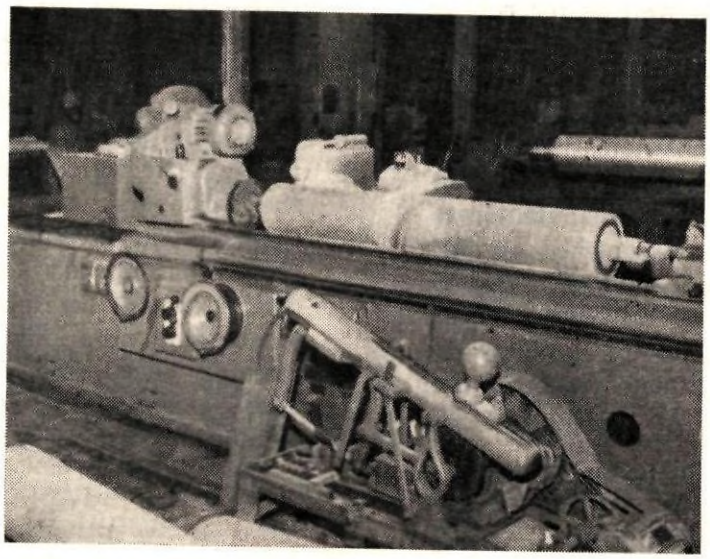
In case of Textile, ultimate finishing or dyeing will depend to great extent on the rollers and the same thing is true for paper industry if the roller is smooth and uniform in dia. the result will be satisfactory and uniform.

The boiler is required for supply of steam which is essential for vulcanisation.

RUBBER SCIENCE:— The tough colourless crepe rubber of a shoe is an example of commercially pure natural rubber known to everyone. It is highly unsaturated hydrocarbon having the composition of isoprene units: C_5H_8. The molecule is a long chain of isoprene units: $(-CH_2-C(CH_3) = CH-CH_2-)_n$, where n is of the order of 5000 or more.

Synthetic Rubber:— Man has never rested and has always struggled to make man-made things similar to natural ones. The first Synthetic Rubber was made by Tiden in 1892 by polymerisation of isoprene, but it was inferior. Afterwards many types of synthetic rubbers were made with great success. The introduction of synthetic rubber has opened a new chapter in the history of the Rubber Industry, as outstanding properties such as oil resistance, petrol resistance, heat resistance and chemical resistance can be obtained by use of synthetic rubber.

Polymerisation of unsaturated monomers gives rubber a superiority to natural rubber. A general purpose synthetic rubber has been made by copolymerisation of butadiene, derived from petroleum, and styrene from coal tar. The rubber is known as GRS or Buna-85 or Butadiene-Styrene-Rubber. Similarly the Synthetic Rubber produced by the copolymerisation of monomers butadiene plus acrylonitrile which is known as perbunan or Hycar, (Nitrile Rubber), butadiene plus isobutylene is known as Butyl rubber and neoprene rubber is produced from polymerisation of monomers. Neoprene is Polymer of 2-Choloro-1-, 3-Butadiene. Recently the introduction of hypalon, Chloro-SulphonatedPolyethylene, Viton and Silicone Rubber has increased the use of rubber in many fields successfully.



Photographs of Dronsfield roll Grinding Machine showing the finishing of rolls.

Our Rubber lining division showing big vuclaniser.

SHORT HISTORY OF RUBBER INDUSTRY

Thomas Hancock is father of Rubber Industry. He was the first to start manufacturing rubber articles. He vulcanised the rubber by immersing it in molten sulphur or by mixing rubber with other materials and sulphur and thereafter heating in autoclave. He thought that by tearing up the rubber and sticking the piece together again it can be free from uneven by the awkward shape. This was the roller fitted with spikes which was rotated inside the chamber. Most to his surprise, owing to the heat generated, his "pickles" gave him a coherent drough — like mass. This discovery in treatment of rubber enabled him to eliminate waste and to convert rubber to any shape desired. He modified the machine which he called masticator. The credit for mixing mill and calender is attributed to Chaffee. He deviated from Hancock method by using two steam heated rollers. Observations and inventions of Hancock established a real basis of modern rubber industry. He developed simple range of products and that is the reason why he is called Father of rubber industry.

Charles Goodyear discovered in 1839 that rubber heated with sulphur gave products which were far superior than raw material and which were not sensitive to temperature changes. This discovery which is known as "vulcanisation" is the foundation upon which the rubber industry is built up.

Charles discovery of vulcanisation of rubber mix is one of the most perplexing and outstanding tales in world history. At that time man had no right to achieve success. He came up against all obstacles. Most of the men did not know what he was doing . only possisible explanation for Goodyear persistence was his thorough belief with, as he put it, "what is hidden and unknown and cannot be discovered by scientific research, will most likely be discovered by accident, if at all, by the man who applies himself most preservingly to the subject and is most observing of everything related thereto." Goodyear work took him to the deepest of organic Chemistry. At that time organic chemistry was in its infancy. No one knew any more about rubber or chemistry of rubber. Goodyear simply belived his way to sucecess. First rubber factory was established in Vienna in 1811.

In England Mackintosh used a very thin layer of rubber between two pieces of cloth to make waterproof coat with stiffer to harness for the winter rain and has to be kept in cool place during summer.

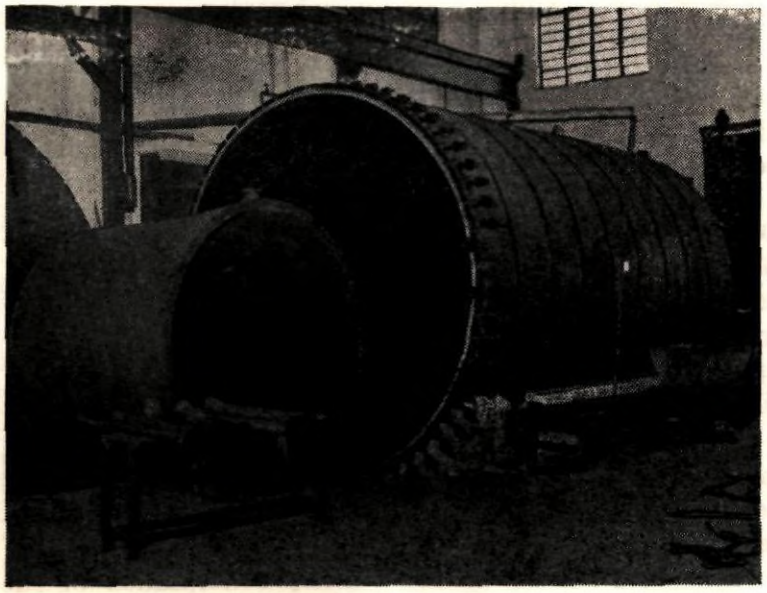
The vulcanisation of rubber was a great impetus to the almost all the industries because rubber was used by

various forms of insulators Goodyear lived to see his invention which gave rise to enormous factories in U.S.A., England, France, Germany employing more than 60000 workers producing over 500 different kind of articles worth more than 10 million dollars a year.

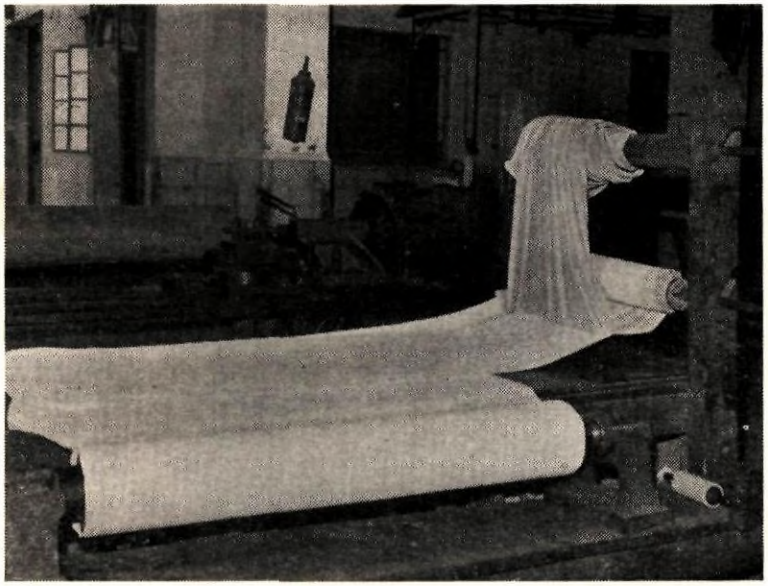
After initial discovery, industry then proceeded towards further advance, which has resulted in number of outstanding scientific and technical developments and introduction of various chemicals and fillers such as Carbon Black, Zinc Oxide, Accelerators and Antioxidants. Rubber industry has become essential industry within the century. It is a matter of satisfaction that in our country consumption of natural rubber before 10 years was approx. 30000 tons and we used to export rubber. To-day we are consuming 1,05,000 tons of rubber and we are importing rubber. The rubber industry has been rapidly expanded and occupies important position in the industrial development of our country. At present it is playing a very vital role.

NECESSITY OF COMPOUNDING:

The object of rubber manufacturer is to produce useful rubber articles of all types and sizes for specific purposes. The primary requirements in design of technical rubber compound is that it

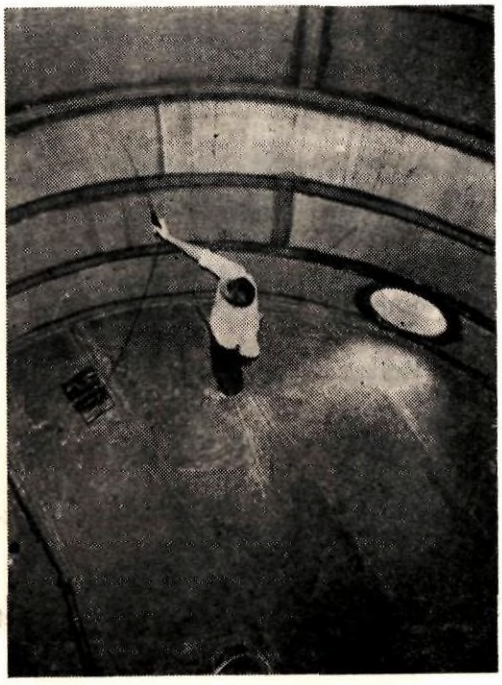


Photograph of big Vulcaniser 4000 mm. dia x 6800 mm .length (13 ft. dia x 22 ft.)



Building up of Rubber Roller. From thin sheets taken from Calender Machine.

Rubber–lining of Tank at site 6000 mm diax6500 height



usually meets service needs at economic price. In a well designed rubber mix each and every compound is introduced to obtain the required and desired effect. The practice of rubber compounding is based on scientific principles and the success of rubber articles depends on the plan of the true compounding with a view to obtain the deshired physical and chemical properties required for specific purpose to meet the service condition. Our industry is mainly connected in the manufacture of Rubber|Ebonite rollers complete with shell or recovering, Rubber sleeves, Ebonite parts, moulded rubber articles of all types and size, metal to rubber bonded wheels, rubber lining of tanks, vessels and pipes. The Textile industry, Paper industry, Rayon industry, and Chemical industry are the largest consumers of rubber covered rollers and rubber lining of chemical equipment. The manufacture of Rubber rollers requires high technical skill, good experience and personal supervision. Hardness and other characteristics of roll covering compounds are determined by:

1. Roll Loading.
2. Speed at which roll is moving.
3. Chemical and temperature resistance required.
4. Abrasion properties of product handled.
5. Service conditions and the accuracy of the dimensions.
6. Correct hardness and resilience.
7. Obtaining of good bond between metal to rubber.

The compounding of rubber will decide the life and the efficiency of the roller. A cheap roller made with clay and whiting will have less life than a roller made with Lithopone, Zinc Oxide and Titanium Dioxide. All the rolls must be balanced properly to decrease vibrations because of high speed. Good balance plus ball or roller bearings give maximum roll performance. Vibrations from unbalanced rolls shorten the life of Rubber covering and damages bearings and other parts of the machine. All the new rollers are balanced as a matter of manufacturing procedure and old ones received for recovering are also checked for balancing.

In case of Rubber rollers the price is not the only criterion but the performance of the rollers is much more important as the finish and life of the rollers will depend on the quality. Three main principles should be observed in connection with the industrial rollers.

1. Manufacturing of rollers properly engineered for the specific work should be entrusted to the qualified and expert manufacturers.

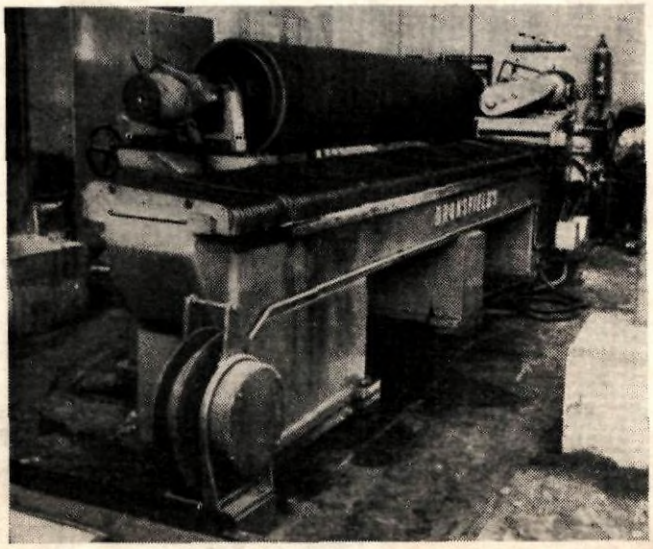
2. Please make sure that the rubber rollers in your plant have a place on your maintenance programme.

3. Always specify your requirement precisely in order to manufacture the right type.

FINISHING ROLLERS:

The ultimate result depends on the accuracy, quality and finishing of rollers. Rollers should be finished on a very precision and accurate machine which gives very smooth and good finish. Rollers should always be finished on automatic grinding machines. In all cases all our rollers are finished on automatic Dronsfield Roll Grinding Machine.

The manufacture of ebonite parts requires great skill for reducing the shrinkage of volume after vulcanisation. At the same time the compound should meet the necessary requirements. It is very clear in designing a compound for Rubber bags a quick curing system must be used and the vulcanisation must have a high tensile strength, high elongation at break, good heat and water resistance and good hot tear resistance. The compounding of moulding articles is also selected according to the service of the industry for which the moulded articles are required. The manufacturing of hot water bottles affords an excellent and outstanding example of careful balancing of the physical properties of the rubber compound against the speed of cure and freedom from scorching (prevulcanisation of products before the rubber is taken for use). The secret of high output in hot water bottles



Photographs of Dronsfield Roll Grinding Machine showing the finishing of Rolls.

manufacture lies in the use of two cores for each mould, the moulds being kept hot and the second core being pre-heated after stripping while the previous cure is proceeding. A curing time cycle of 8 to 10 minutes is optimum.

The compounding of rubber lining is very skillful job and art. Rubber can withstand large number of chemicals and rubber lining is tailor made job. All the facts are taken into consideration such as working condition, temperature, chemicals and then the rubber is formulated with determination to meet the service condition. It is likely that in case of rubberlining compound suitable to a chemical industry will not be suitable or will not meet the requirement of other industry, where there is change in chemical or working condition.

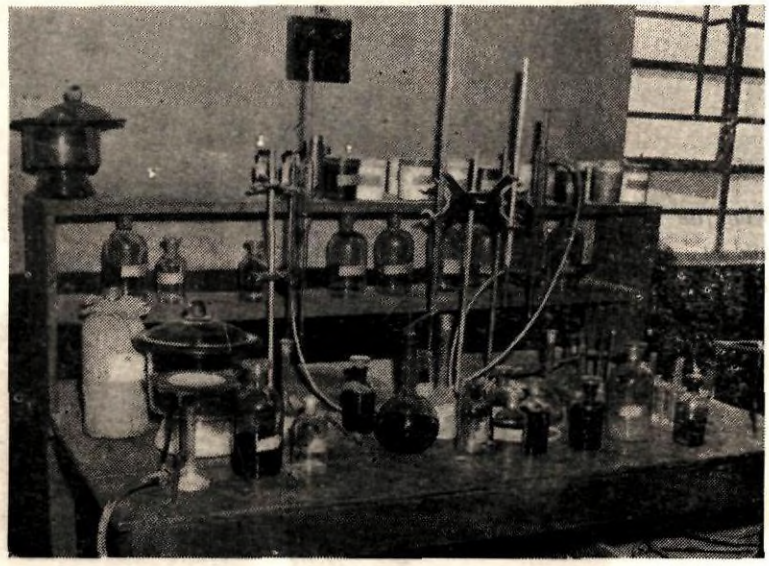
RUBBER PHYSICS: Rubber has good physical properties such as elasticity, resilience, high tensile strength, high elongation, great range of properties from soft and hard rubber, good capacity for absorbing energy, good abrasion resistance, good electrical properties and excellent water proofing properties. Its most characteristic properties are softness

Hon. Shri. PATIL SAHEB is watching the stripping of rubber bag with interest on 17th May 1959.

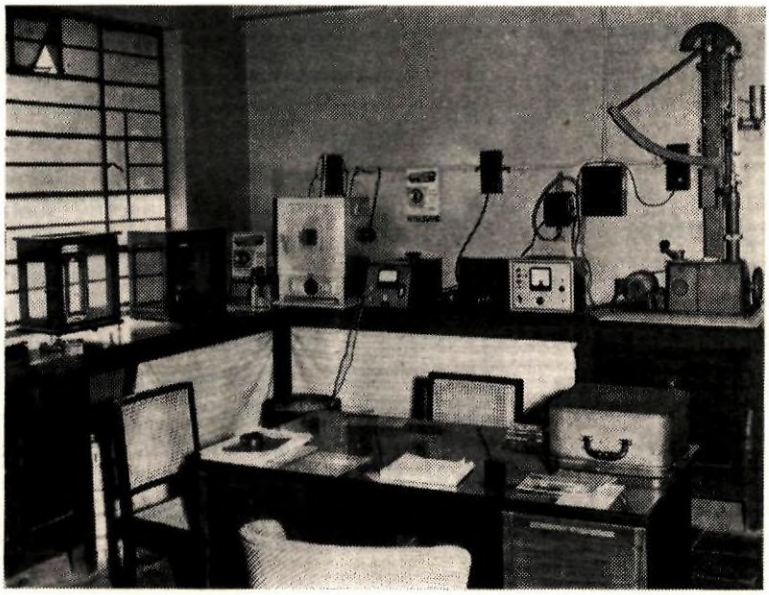
and reversible extensibility. All these properties of rubber have helped the industries and mankind to better comforts and better services.

PHYSICAL TESTING OF RUBBER:

Since many years the outstanding tests of rubber have been tensile strength at break, elongation at break on normal and aged test pieces. Bonding strength is necessary for metal to rubber bonded articles. Further more tests are also carried out for abrasion resistance which gives an idea how the rubber is wearing out compared to other type of rubber. In case of ageing tests, the rubber is heated for 150 hours at 60° C. and the tensile strength and elongation at break are checked up before ageing and after ageing which will give indication how the rubber will behave in atmospheric condition and the depreciation value after ageing should not be more than 20%. Hardness is very important and the hardness is determined in various methods. Usually Shore 'A' hardness tester is used for measuring the correct hardness of rubber rollers. For most of the paper industries, the hardness is determined by P. & J. Meter with 1|8″ ball. Permanent set, tear resistance, flexing are the main physical testing of rubber. Resilience is also important as it gives idea about the ability of rubber vulcanisation to return the energy used into deform it.



Photograph showing the testing equipments at our laboratory.



Photograph showing the testing Equipments at our Laboratory.

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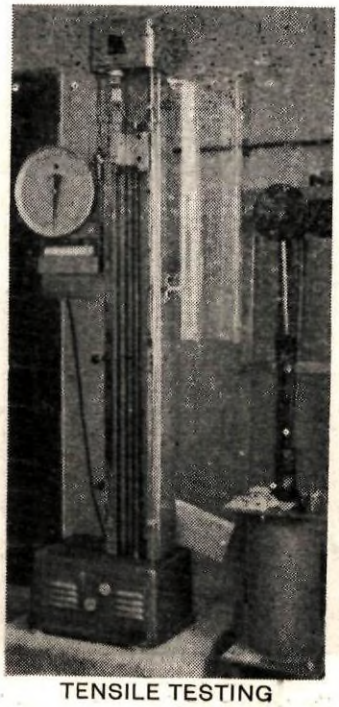
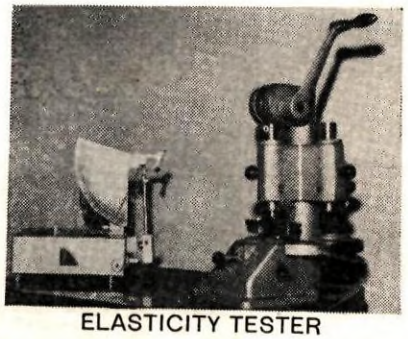


TENSILE TESTING Machine



ELASTICITY TESTER

ABRASION TESTER

Spark testing is very important in case of rubber lining. The rubber lined articles are tested with spark tester at 20000 volts in order to ensure that the product is without any defect. This test shows even the pin holes. or leakages in the lining which is impossible to see with naked eye and this test gives the leakproof product.

THE IMPORTANCE OF RUBBER:

Rubber is indispensable to modern civilisation as major industry and normal life and warfare are dependent on this commodity. Its importance in transport is clearly evident by the use of tyres and tubes in automobile industry, aeroplane and cycles but in its other application it plays a very important part. It is worth considering how rubber is connected with our daily life. The entire transport i.e. road and air is dependent on rubber for smooth running. Mechanical rubber goods as belting, packing valves, moulded articles, V-Belts are playing very important part in almost all industries. Rubber covered rollers and other rubber articles are very vital products for all the heavy and light industries. Rubber cables and rubber coated fabrics, rubber shoes and rubber toys are very common. Rubber lining of vessels and pipes are important for chemical industries otherwise the process is difficult and the problem of corrosion is solved by rubberlining. It is this versatile material which stands to any working condition of almost all chemicals. Modern war cannot be waged without rubber as rubber parts are absolutely essential for easy transportation such as lorries, tankers and aeroplanes. Rubber insulation of wires and cables makes particularly an important contribution to defence service for efficient communication. Rubber also plays very important part in engineering industry, textile, paper and rayon industry. Rubber is connected with all industries. Hospital rubber goods such as hot water rubber bags, ice-bags and sheeting are giving quick relief to the mankind. Rubber has varied uses for many useful products such as Raincoats, rubber rings for sports, rubber threads, gum-boot, elastic bands and sealing rings. The introduction of sponge rubber has opened a new chapter for comfort and fancy living. Rubber has taken a modern civilisation a long way as being a service industry and its versatile use can be seen almost at every stage in our daily life and mainly rubber industry is a service industry.

Recently spectacular changes are made technically in rubber compounding to perform various duties and to meet the various service conditions. to have desired toughness resistance to solvent, chemical, wear and tear. Recent discovery of Synthetic Rubber specially good resistance to oil and petrol and corrosion to oxidizing agent even at high temperature have reduced number of substance against which

Photograph showing Rubber-lined centrifuge basket, 3500 holes lined Acc uately.

Photograph showing Rubber-lining of tank in process.

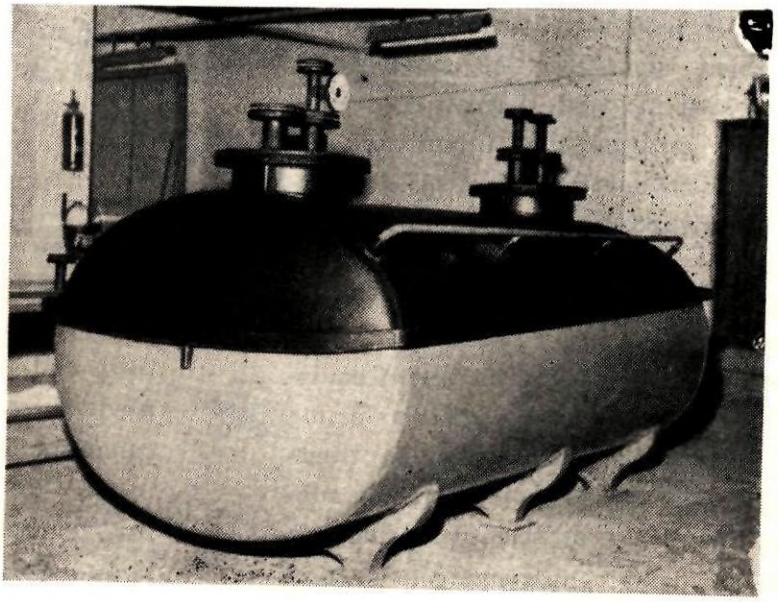
rubber did not have satisfactory resistance.

Rubber lining is playing very important part in chemical industries to protect the material and its performance is to withstand the chemical action and to prevent contamination of the contents of the vessels or pipes.

There are wide ranges of application for rubberlining starting from chemical industry such as storage tanks, pickling tanks, plating tanks, valves, rubber lined pipes, towers, bends, stirrers. Hypalon rubber has got very good abrasion resistance and it can withstand the action of many chemicals even at high temperature. There are various advantages in rubberlining compared to stainless steel or monel metal. By using steel frame work the technicians have at their disposal material which can be put for any use. Freedom from leakage, mixing resistance, abrasion, corrosion can be obtained by rubberlining. It is also possible to rubberline at site certain important equipments such as Bleaching Towers or big pickling tanks which cannot be transported. In our case we are doing rubberlining on very scientific principles. We are doing rubber lining in Natural Hard rubber and soft rubber, Neoprene Rubber, Nitrile Rubber, Hypalon rubber to meet the various service conditions. Our method of rubberlining is based on a very scientific basis and our rubberlining is equally best to any foreign make. In our case, the work is carried out under personal supervision of highly foreign trained technicians. (1) Metal preparation is very important and this is one of the basic method required to have good rubberlining as the bonding between metal and rubber will depend on the metal preparation. The metal should be entirely cleaned by sandblasting. (2) Using good imported chemical agent as bonding agent to obtain satisfactory bonding between metal and rubber. (3) Application of rubber:— The rubber sheets are taken out from imported calender machine in plies. The rubber sheets are plied up to build up the desired thickness. We are using minimum two layers of calendered sheets. By doing this process the thickness will be uniform and precision without any porosity and avoids all air bubbles. (4) Vulcanisation in autoclave to obtain good result. (5) Testing with high voltage unit of 20000 volts to ensure that there is no defect in the rubberlining or any leakage.

Photograph showing various types of odd sizes pipes & Bends.

Photograph showing Road Carrier for HCL duly Fabricated & Rubber lined by us Outside lining is also Rubber-Lined.



The Management takes pleasure in conveying their deep thanks to Hon. Shri S. K. Patil for performing the inauguration of our new factory on 17th May, 1959. The Management is also extremely thankful to Shri Prabhubhai V. Mehta for extending valuable support and co-operation in case of our difficulties. We have also adopted certain principles of quality control and to establish modern laboratory because of the encouragement and guidance we received from him from time to time.

We have also great pleasure in acknowledging with deep gratitude the patronage received from various clients, various elders, friends, well-wishers, suppliers of our requirements, our agents and consumers of our products. We also acknowledge the co-operation of our staff members and workers who has always helped us for better progress. Because of the valued co-operation of our staff members and workers, we have progressed rapidly. We were lucky enough to make satisfactory and steady progress only due to the kind co-operation and valued support we received from all sources. It is also matter of satisfaction that there is very good team work existing in our factory and all the staff members and workers are treated as family members. All the workers are also treated very nicely and there is no dispute among us since the beginning of the factory till to-day.

On this occasion we also take this opportunity to convey our deep gratitude to the Maharashtra State Financial Corporation for the kind co-operation extended to us by giving various loans to meet our plans. We are also thankful to Directorate of Industries Maharashtra Government who have encouraged us to grow from small scale unit to a large scale industry. Office of the Textile Commissioner have also extended fullest co-operation to us for which we are obliged to them.

We are also highly thankful to the Directorate General of Technical Development, Rubber Division, Ministry of Industry who have helped us in our difficulties and encouraged our industry from small scale industry to large scale industry. We have received valuable co-operation from almost all the departments and we are obliged to them.

It is also a matter of satisfaction that very good relations are exsisting between the management, staff members and workers. Due care for all members who are working in the factory is taken. Food is provided at subsidised rate as well as uniform, bonus and other facilities are also given, such as medical relief, assistance for education etc.

We are deeply grateful to Hon'ble Shri S. K. Patil for performing the opening of our final extension. We feel that we are fortunate enough to have his blessings.

We once again convey our deep and sincere thanks to all those who have helped us. As a matter of fact by the grace of God we are fortunate enough to get full cooperation from all. It is a matter of satisfaction that we have achieved good results due to assistance and cooperation received from all. We assure you that on our part we shall do our best to satisfy our clients in all respects and shall extend better help in coming years.

On this glorious occasion we pledge ourselves again to serve with all our might to the industry and the prosperity of our great Nation. A step towards maintaining better quality on scientific basis to serve the nation in better way has been taken by us with the help and the continuous co-operation of all our clients and well wishers.

Photograph showing Hon. Manubhai shah's visit to our stall in Delhi Taking keen interest in our Rubber-Lining equipments during Nov. 64.

PROUD ACHIEVEMENTS.....
MATTER OF SATISFACTION.....

A paper mill in east India was urgently in need of rubber lining for its Bleaching Tower supplied from Germany. The height of the tower is about 9500 mm. (75 ft.) and the diameter is 2500 mm. (10 ft.) There is a smaller tower inside it which is 9500 mm. (65 ft.) and 1525 mm. (5 ft. dia.) in diameter.

Our technicians and engineers worked hard to do a job that had seldom been carried out in our country. The work was completed efficiently and received considerable praise from the paper mill.

A similar assignment was one of rubber lining the pickling tanks at the Indian Tube Co. Ltd., Jamshedpur. There were six such tanks, each 8700 x 1800 x 1225 mm. (28' x 6' x 4') and two storage tanks of 2500 mm. (10 ft.) diameter 3800 mm in (15 ft.) height. The client expressed complete satisfaction with the work.

Both these jobs were done at site and tons of rubber were consumed. The climate at both places is very hot in summer and humid during the monsoon. As such, correct compounding of the rubber was of vital importance and was carried out with great skill by our specialists. Also, for the first time in this country we have recovered rubber rollers in sizes ranging up to 4000 mm. x 750 mm. dia. and weighing 10 tons in total weight. The excellent results achieved reflect the great co-operation we received from our clients.

Indian-managed, I.S.C. is carrying out jobs the equal of any being done in foreign countries. We have been tackling a number of difficult problems and making them possible through the use of a highly scientific approach. For example, a new 6100 mm x 610 mm dia. (66"x24".) imported calender and a 4000 mm dia x 6800 mm (22'x13') vulcaniser have recently been installed to meet the increasing demands of industry and to give our clients the better service which they deserve.

INDUSTRIAL SUPPLIES CORPORATION has been serving the nation for 13 years in the manufacture of industrial rollers and rubber lining. We always believe in taking initiative and lead making difficult things. It is our desire to make many things in coming years which are not made in our country.

A RELIABLE SERVICE TO THE RUBBER INDUSTRY, UNDER FULLY TECHNICAL SUPERVISION.

MINISTER FOR HOME,
GOVERNMENT OF MAHARASHTRA,
Sachivalaya, Bombay-32.

5th October 1966.

Dear Shri Lathiyaji

Thank you very much for your letter of the 26th September 1966, inviting me to bless the occasion of the opening ceremony of your factory extension which is to be held on 23rd inst. It would have been my pleasure to participate in the function but for the other commitments on that day. I, therefore, regret my inability to accept the invitation. However, I send my blessings on this occasion and wish your factory a prosperity.

Yours

(D.S. Desai)

To

Shri S.V. Lathia,
Rubber Technologist,
Industrial Supplies Corpn.,
Sakinaka, Kurla, Andheri Road,
Bombay-70 AS.

KASTURBHAI LALBHAI

TELE{GRAM : "LALBHAI"
PHONE : 6023 & 2338

PANKORE'S NAKA.
AHMEDABAD.

28th September, 1966.

My dear Mr. Lathia,

I am in due receipt of your letter dated 21st September, and am pleased to learn that you are now extending your factory. I realise the important contribution that you have made by undertaking successfully the manufacture of rubber products and wish that your project for the extension of factory will be crowned with success.

Yours sincerely,

K. Lalbhai

Mr. S.V. Lathia,
Industrial Supplies Corporation,
"Sambhav", Block No.10,
Plot No.41, King's Circle,
Bombay.19. D.D.

BOMBAY HOUSE,
FORT, BOMBAY, 1
September 29, 1966

MESSAGE

It is very gratifying to note that Industrial Supplies Corporation are inaugurating their factory extension on the 23rd October 1966. They are one of the leading manufacturers of Rubber/ ebonite rollers and rubberlining of tanks and process vessels.

I wish them every success in their business.

(Naval H. Tata)

B. D. GARWARE

CHOWPATTY CHAMBERS,
BOMBAY 7 (INDIA).

CO/19/15/2/A

October 6, 1966

Dear Shri Lathia:

Thank you very much for your invitation for the inaugural function of your factory extension as also the kind sentiments and respects you have showered on me. Whatever little I have done, I owe it all to the young persons who have been willingly sharing the responsibility, especially my sons.

I would have loved to join you all in meeting Hon'ble Shri S.K. Patil, had it not been for an engagement committed earlier. I am, therefore, very sorry that I will have to miss the pleasure. To my mind, God always blesses the hard work as yours, but since you insist on receiving my blessings, I send herewith these few words:

"Very few occasions give me such pleasure as watching a select band of hard-working young men growing with industry from individual efforts. Shri S.V. Lathia, a qualified rubber technologist, has used his education in furthering the industry and I share this thrill in seeing it grow. I am sure the young persons he has trained will keep the flag flying. I wish them all success."

With personal regards,

Yours sincerely,

(B.D. GARWARE)

Shri S.V. Lathia
Industrial Supplies Corpn.
Sakinaka, Kurla-Andheri Road
Bombay - 70

Dr. Norbert Riede c/o

FAMATEX GMBH

FABRIK FÜR TEXTIL-AUSRÜSTUNGSMASCHINEN

STUTTGART
KORNWESTHEIM

GESCHÄFTSLEITUNG

Mr.
S. V. Lathia,
c/o Messrs. Industrial
Supplies Corpn.
Sakinaka Kurla,
Andheri Road

Bombay - 7o A.S./India

September 3oth, 1966

VL/Dr.Ri/So.

Dear Mr. Lathia,

I was pleased to see from your letter that your new factory will be inaugurated on 23rd October, and I would therefore like to send my personal regards and greetings with best wishes for yourself as well as your Company and for a prosperous future of your enterprise.

With best regards

yours sincerely

Dr. Norbert Riede

MASCHINENFABRIK Briem

BRIEM-HENGLER & CRONEMEYER K.G.
415 KREFELD
ADLERSTRASSE 45
POSTSCHLIESSFACH 2010

KALANDER, FOULARDS
UND AUSRUSTUNGSMASCHINEN
KALANDERWALZEN ALLER ART
GRAVUREN

Messrs.
INDUSTRIAL SUPPLIES CORPN.
Sakinaka, Kurla - Andheri Road
BOMBAY - 70 A. S. / INDIA

Ihr Zeichen	Ihre Nachricht vom	Unser Zeichen	Datum
		B4/sp	October 3, 1966

Dear Sirs,

We have been informed that the inauguration of your factory will be performed by Hon. Shri S. K. Patil, Union Minister for Railways, Government of India, on October 23, 1966 at 11 am.

We know that in this time of keen competition special efforts were needed both to build up and maintain satisfactory sales, and to bring your products to the extent of that high technical level they have reached now.

We, therefore, take the liberty in submitting you our best wishes to the final extension of your factory, and shall be pleased to be of service to you at any time.

Yours very truly,

MASCHINENFABRIK
BRIEM-HENGLER & CRONEMEYER KG

SINGAPORE POLYTECHNIC

PRINCIPAL: A. ROBERT EDIS, B. ENG., M.I. MECH. E., M.E.I.C., M.I.NUC.E., A.F.C.A.S.I., M.I.E(M).

TELEGRAMS: POLYTECH, SINGAPORE
TELEPHONE: 71873

PRINCE EDWARD ROAD,
SINGAPORE, 2.
(P. O. BOX 2023)

4 October, 1966

IT IS A SOURCE OF GREAT PLEASURE TO LEARN FROM MY OLD STUDENT, Mr S.V. LATHIA, B.Sc.(Hons), L.I.R.I., J.P., OF THE INDUSTRIAL SUPPLIES CORPORATION, THAT THE FINAL PHASE OF HIS FACTORY EXTENSION WILL BE OFFICIALLY OPENED BY THE HON. SHRI S.K. PATIL, UNION MINISTER FOR RAILWAYS, GOVERNMENT OF INDIA, AT 11 A.M. 23 OCTOBER, 1966.

THERE IS SOMETHING PARTICULARLY SATISFYING IN WATCHING THE DEVELOPMENT OF A MAN WITH WHOSE EARLY TECHNOLOGICAL TRAINING ONE HAS BEEN ASSOCIATED. Mr LATHIA HAS TAKEN FULL ADVANTAGE OF EVERY OPPORTUNITY THAT HAS COME HIS WAY. I AM PROUD TO WISH HIM, HIS ORGANISATION AND COLLEAGUES, EVERY BLESSING IN THE PROMISING YEARS AHEAD.

F.H. COTTON
Ph.D., M.Sc., F.R.I.C., F.I.R.I.
Principal Lecturer
(Formerly: Head,
National College of Rubber Technology,
LONDON N.7, England.)

FHC/SKY.

FAMATEX
GMBH
FABRIK FÜR TEXTIL-AUSRÜSTUNGSMASCHINEN
KORNWESTHEIM BEI STUTTGART
POSTFACH 86

TELEFON:
KORNWESTHEIM (07154) SAMMEL-NR. 6241
FERNSCHREIBER: 072-2298
TELEGRAMME: FAMATEX STUTTGART

FAMATEX GmbH 7014 KORNWESTHEIM

Mr.
S.V. Lathia
"Sambhav", Block No. 10
Plot No. 41, King's Circle
Bombay - 19 D.D.
Indien

Ihr Zeichen	Ihre Nachricht vom	Bitte bei Antwort Abteilung unbedingt erwähnen	Unser Zeichen	Datum
	24/9/66			7th October, 1966

My dear Mr. Lathia,

I have really been pleased very much by your letter of the 24th September and the good news you forwarded to us.

You may be assured that for inauguration of the final extension of your factory I not only extend my best wishes to you for success of your endeavour and conclusion of the works, but I also want to submit my best wishes for remunerating work in your company for which I always rendered my highest esteem. Please, do not take me wrong if I want to express my admiration and surprise in what short time you managed to build up your company and bring it to the present day importance.

I hope and trust that I shall have opportunity to meet you again on occasion of my next visit to India, and then I shall take the pleasure to view your factory in all detail.

May I voice again all my best wishes.

With kindest, cordial regards, I remain, also on behalf of my wife to your and your family,

Yours sincerely,