

 **LIDERROLL**
SOLUÇÕES PERMANENTES DE ENGENHARIA

**DRIVE ROLLERS FOR CONSTRUCTION
“PIPELINES DISPATCH” AND PIPE PERMANENT SUPPORT**



RMOPAP®

Liderroll Indústria & Comércio is a dynamic company that carries out industrial and commercial activities in today's market in the Mechanical, Aeronautical, Marine, Construction, and related fields, operating in various regions of Brazil.

We are a company with time-proven and solid ideals in the preservation of quality, and stand at the forefront of technological creations and renovations, concentrating all efforts on the search and preservation of this vision.

Liderroll's management is implemented by a high end-product quality and industrial safe policy, seeking at all times to avoid environmental damage and consistently develop and utilize the company's own manpower.

Our company is 100% Brazilian and counts on a specialized technical team with unquestionable operational reliability, capable of providing the following services:

WHAT WE DO

- Visitation to industrial units and design companies, for detection of technical development, with implementation of the improvement of the project and reducing operating costs and installation, always with the optimization of the process and industrial plants, breaking paradigms with application of new materials and structural geometries.
- Design and manufacturing of devices used for permanent support of 4" to 104" pipelines.
- Small and medium sized boiler making service.
- Design and manufacturing of tooling.
- Manufacturing and recovery of machined parts for mechanical industries in general.
- Manufacturing of machines and equipments.
- Manufacturing of pipes supports for support rollers and drive rollers.



Manufacture of 28" Drive Rollers and Racks for GASTAU Tunnel



Roller System Control Cabin



Displacement Appliance



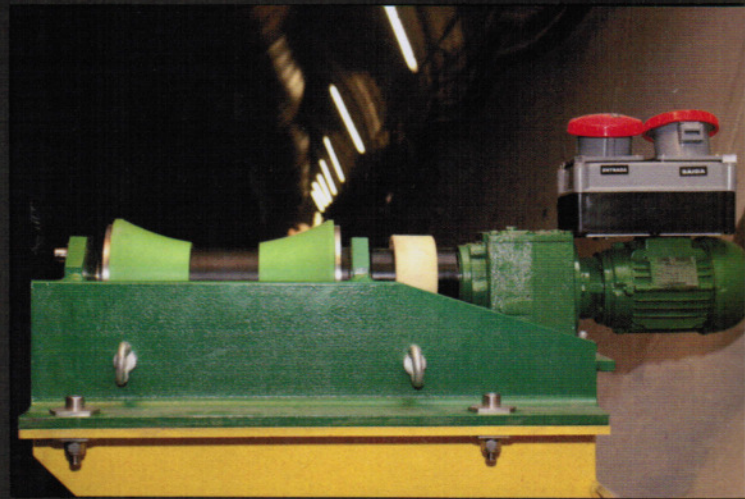
RMOPAP® drive rollers for construction “pipelines dispatch” and pipe permanent support

Driver Roller for pipes dispatch of 4” to 60” diameter

The Liderroll, due to its experience, detected for the segment of ducts construction and pipelines in confined environments, such as: Tunnels, trenches and congested sites, the need to solve all the problems inherent to UNHEALTHY; LOGISTIC; HIGH COSTS, LOW PRODUCTIVITY; INDEX OF REPAIRS AND QUALITY. In such way, Liderroll developed and patented the project of, beyond the Drivers Rollers in High Performance Plastics (RMOPAP®), all the manufacturing philosophy, inspection and previous release of columns, in PIPE SHOP external to the tunnels with posterior “Line dispatch” to its inside, all without the need for human presence at that location.

The conventional construction method was to transport all the tubes into the tunnel (“Parade operation”) and now place them in alignment, which would require the need for trucks and special cranes, that many times are not appropriate for the spaces and quotas of the “headroom”. Then the operations of logistics support begin, such as air supplement hyperventilation, weld process residual gas decontamination, electric energy provisioning (a big problem, considering the long distances) and finally, the problem of lighting, extreme heat, inspections, painting, bathrooms, refectory and the proper daily transport from in and out between the work fronts to meet all the steps required; confirmed also that the methods of construction, in order to reduce construction costs, each day more are considering sections fully circular and of small diameters, restricting the roller track and preventing to have two-way flow of displacement, a serious problem to the contingency plan and the SMS.

As the second generation of rollers (RMOPAP®) is fully motorized, the assembly operations of the ducts into the tunnels, trenches and congested sites, are largely accelerated, as the rollers themselves will be responsible for the traction of the pipes and upper permanent backing.



This new constructive method from LIDERROLL eliminates the unhealthy result of the transport, assembly and welding works, ensuring excellent operational condition of SMS. It resolves the pipes transport to its interior (“parade”) conflicts, provides drastic reduction on costs and time spent to build the lines, decreases the size of the assembly team and allows the parallelism between the other activities that may be necessary.

With all the Drivers Rollers already previously soldered to the interior of the tunnel, the production capacity with the external welding of 48 meters of length in the external pipe shop (4 pipes with 3 simultaneous welding), the required time in the operation of “Stretch dispatch” are 16 minutes for each length.

This new constructive method of the LIDERROLL, among others advantages, allowed the centralization of all work teams: direct, indirect, supervisions, inspections, receiving of materials, medical clinic, refectory, bathroom, dressing room and point of energy, in a single fixed Site, with total conditions of comfort and security, with this, eliminating the necessity of the displacement of the work fronts and the accompaniment restrictions of the operational supports that supports the ducts construction.

Advantages

1. Technical Advantages

3. Cost Advantages

2. Quality Advantages

4. SMS Advantages

Technical Differential

- Highest productivity, drastic construction time and assembly reduction, drastic costs reduction, improving the welds quality, eliminating the accidents risk inside of the tunnels.
- Resolve in definitive the weld machines electrical supply problems due to the large involved distances between the machine and the work front, due to the inability to use generators inside of the tunnels because of the carbon monoxide generation.
- Elimination of the technical inconvenience and inherent insalubrities to welding works inside of tunnels.
- Elimination of the pipes transportation need in the tunnel confined space (parade) and the conflict of traffic in opposite directions, as well as lifts space conflicts in its interior.
- Elimination of the job installation / uninstallation movement as assembly progresses.
- Electrical consumption low, because all Drivers Rollers have low power and, therefore low current, which allows to have wires most simple (low cost).
- Dramatically reduces the need for human inside of the tunnel to the constructions and launch phases of the line and "hot" services.
- Resolve logistical problems regarding to physiological needs of the work teams, since the involved distances, the circular geometry and difficult traffic, prevent the chemical toilets installation inside of the tunnels.
- Allows modulated installation in each line, where each project can be implemented in accordance with the needs of their time, in any position, maximizing the tunnel occupation rate without any welding operation (only assembly with screws and solder).
- Not require welding of "chambers of reinforcement", or any other type of permanent structure for backing up the line.
- All structures as well as the rollers are prefabricated in Linderroll, having only to fit the transport and fixing them without any welding, painting or industrial assembly inside of the tunnel.
- For making the lines launch 100% in the tunnel axle line axial direction, allows the complete approach between the ducts, greatly increasing the occupancy rate and tunnels exploitation and bringing huge savings, since for the same tunnel can be passed the double of numbers of the original products.
- For making the lines launch 100% in the tunnel axle line axial direction, maximizing the space for cars movement.
- For making the lines launch 100% in the tunnel axle line axial direction, provide civil construction with tunnels with diameters much smaller and much cheaper.
- They are excellent thermal insulators.
- All mechanical structures have anti-corrosion protection for atomic metallization with Zinc thermal aspersion in layers that prevent the presence of oxidation, as the norm, for a period of 30 years.

Release of 38" pipeline inside GASDUC III Tunnel - 3750 meters.



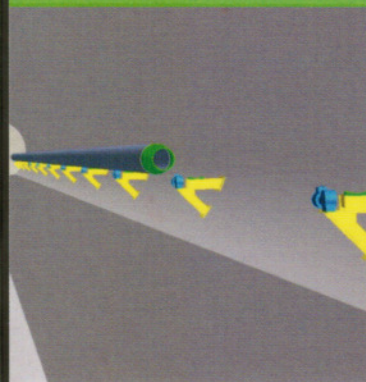
Release of 28" pipeline by Drive Rollers inside GASTAU Tunnel - 5100 meters.



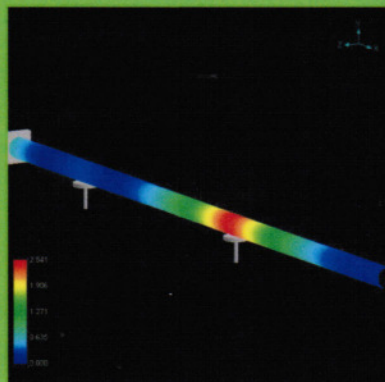
Driving and monitoring system of Drive Rollers inside the Control Cabin

Backing and Drivers Rollers, with 28" duct

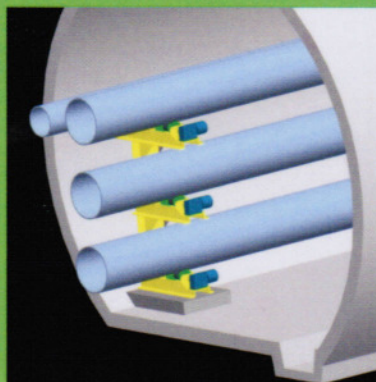
View of Duct Dispatch



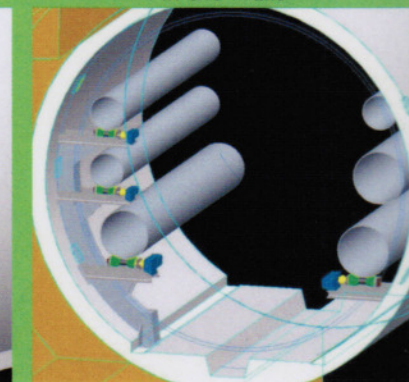
Structural Analysis in Balance



Arrangement with Vertical Loading



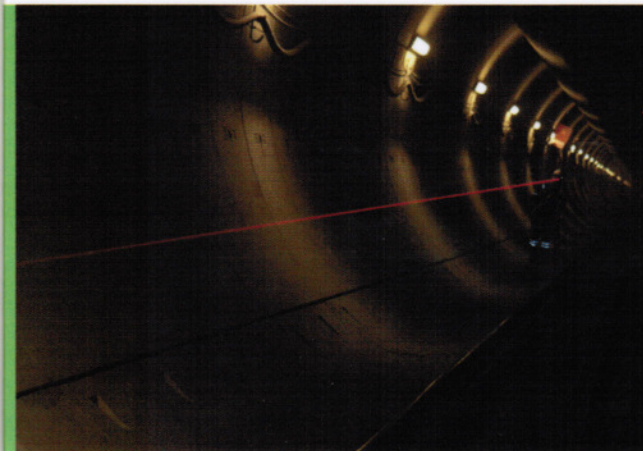
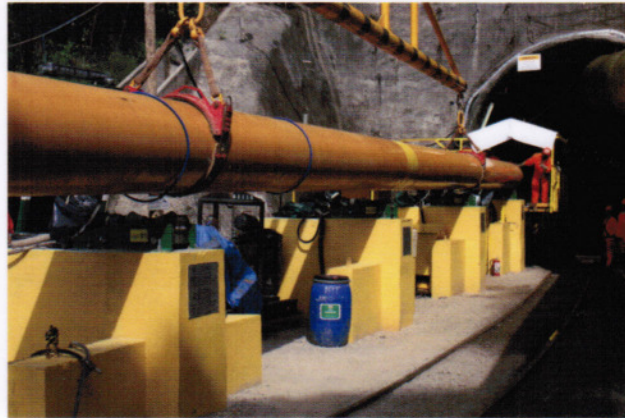
Optimized Arrangement in the Walls



ATTENTION

The construction philosophy of pipelines in external pipe shops with further shipping of columns for the interior of congested Tunnels, Ditches and Sites, by means of Drive Rollers and their corresponding supporting structures, has patents pending No. PI.0800385-8 and PI.0904280-6.

LIDERROLL TECHNOLOGY FOR 28" PIPELINE RELEASE INSIDE GASTAU TUNNEL



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