

- Functioning (performance)
- Load loss
- 4. Galvanized products (steel carbon pipes, malleable iron couplings and electric pipes)
  - Zinc layer adherence
  - Uniformity of the zinc layer (preece)
  - Zinc mass per unit area
  - Hydrostatic
- 5. Ceramic and fibroement products
  - Diametral compression
  - Permeability and internal pressure
  - Water absorption
- 6. Plastic products (PVC, polyethylene, polypropylene and polyester)
  - Thermal contraction
  - Dimensional stability
  - Density
  - Leaks joint
  - Softening point (VICAT)
  - Hydrostatic pressure with short, average and long duration-pressure, time, and temperature
  - Mechanical properties(tension and modulus of elasticity through traction or flexing)
  - Stiffness factor: load x deflection
  - Flange axial and tangency stress
- 7. Gate Valves
  - Hydrodynamic tests (performance)
- 8. Metal products(plates, pipes, steel wires, copper and brass profiles,etc.)
  - Draining limit
  - Modulus of elasticity
  - Bending
  - Resilience limit
  - Stretching
  - Macrography
  - Other determinations depending on stress, traction or compression
- 9. Marine sediments, clay and correlated material
  - Dampness
  - Granulometry
  - Specific weight
- 10. Gauges
  - Press
  - Torquemeters
  - Manometers

**Non-destructive tests:**

Quality control of welders and plates through gammography, ultra sound, holiday director, magnaflux and penetrating liquids.

**Protection against corrosion:**

Making a profile of the electro resistance of the soil, indicating the method for protection to be used, inspecting(at the site) of the protection system employed, inspecting the setting of pipes, checking the failures in the protection systems and studying protection against cathodes.

**Technical assistance to manufacturers:**

Assessment and consulting to the industry, concerning the development of new manufacturers and the quality of the material and equipment used in public water and sewer systems.

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## Principal Accomplishments

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- Program to control the Quality of the Water for Public Supply in Greater São Paulo, and in the Southern and Northern Coasts.
  - Evaluation and control of the quality of the air and the noise in Greater São Paulo (one of the results of this project is the Index of air Pollution, obtained through telemetric stations and given daily to São Paulo's press).
  - Studies about the balneability of the beaches on the coast of São Paulo (CETESB informs the press weekly about the situation of the beaches in São Paulo, classifying them as adequate or inadequate for use).
  - Analysis of projects and complete follow-up of the works carried out in Manaus in the Amazon for laying sewer pipes under water.
  - Technical assistance for basic sanitation procedures in the country side of the state of São Paulo.
  - Checking the performance, and studies for the improvement of treating stations in several cities in Brazil.
  - Studies about laying underwater sewers, including oceanographic survey and research for the city of Maceió, in the state of Alagoas; Fortaleza, in the state of Ceará; and Santos, in the state of São Paulo.
  - Inspection of the material used in basic sanitation for almost all the sanitation companies in the Country.
  - Analysis, inspection and technical follow-up of the works and services as a technical agency of the BNH- Bank for National Housing, in several expansion and improvement programs for sanitary sewer systems and water supply systems in cities in the state of São Paulo.
  - Bioecological surveys of CESP's, FURNAS's and CEMIG's reservoirs.
  - Research about the use of weeds in animal feed.
  - Elaboration of the Environmental Sanitation Plan for the Metropolitan Area of Recife (SAGRES Project of SUDENE).
  - Services for qualifying welders and welding procedures, gammographic trials and sunlight control, at the site, in the rough water aqueduct of the Open River System in the Federal District.
  - Specialized technical assistance during the various phases of ceramic pipe manufacturing for basic sanitation.
  - Studies about the dimensions of the Cathodic Protection System by anodes for Acarapé's aqueduct, in the state of Ceará, including tests to evaluate the coating of tubes and studies about the needs for protecting the aqueduct.
  - Inspection of the material and equipment used by CORPOSANA to set up the Potable Water Supply System for the cities Vila Rica and Coronel Oviedo in Paraguay.
  - Specialized assistance in preparing technical specifications, elaborating bidding processes and necessary hiring to carry out the works and services for constructing five treated water reservoirs in Terezina, in the state of Piauí.
  - Research to establish criteria for projects of stabilization lakes.
  - Detecting interconnections of sanitary sewer networks and pluvial water paths through the use of radioactive tracers in several basins in São Paulo City and in Santos.
  - Research about Estuary Mixtures and Bacterial Decaying in the waters on the coast of Fortaleza, in the state of Ceará.
  - Simulation and interpretation of the quality of the water in the Paraíba River, in terms of OD and DBO parameters, for different conditions of wastes released in head reservoirs.
  - Studies about the monitoring of waters in Santos Bay for a follow-up of the performance of underwater sewer systems in the area.
  - Assistance in elaborating the new legislation concerning state system for managing environmental resources.
  - Project ELBA, trash energy in the lowlands of Santos, comprising studies for sanitary dirt fills with urban and industrial biodegradable trash.
  - Setting up a national action policy, created by government agencies, concerning problems such as the collection, transportation and final destination of the trash produced by the population.
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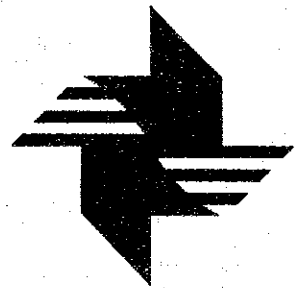


- Planting a public clean up policy in the towns of the state of São Paulo.
  - Studies about air pollution caused by motor vehicles.
  - Opinions about the positive or negative interference that may occur from the reforestation works in the area of the Rodovia dos Imigrantes (Immigrants Road), mountainous segment of the highway, within the basin of the Pirlés River.
  - Various studies about alternative areas for planting industrial centers.
  - The transfer of technology from CETESB to FEEMA, for planting in the latter a Data Bank of the Quality of the Environment.
  - Many courses and trainings about environmental sanitation carried out at CETESB or in governmental agencies and private companies.
  - A follow-up in the control of water vegetation by using herbicides in the Billings, Pirapóia and Rio das Pedras reservoirs having in mind the risks of the various uses of the water.
  - Planting the project of in the Hydrographic Basin of the Paraíba do Sul River.
  - Program for Pollution Control in Cubatão.
  - Program for the Control of Sulfur Oxide in Greater São Paulo.
  - Program for restoring the quality of the waters in the Jundiá River.
  - Program for restoring the quality of the waters in the Piracicaba River.
  - Program for restoring the vegetation in the coastal mountainous area.
  - Project for treating sewers through anaerobic digesters of upward flow.
  - Project for treating sewers in small communities.
  - Technical assistance program to cities in the state of São Paulo.
  - PRO-LIMP- Program for improving the quality of the water in the state of São Paulo.
  - Measuring the consumption of light vehicles and OTTO cycle engines.
  - Emergency project for restoring the coastal mountainous area. (of seeds and aerial sowing)
  - Studies about the impact of mercury in waters where gold is extracted.
  - Technical assistance for implanting a program of industrial pollution control in the state of Santa Catarina.
  - Technical assistance to PRONACOP-National Program For Industrial Pollution Control.
  - Technical assistance to PROCONVE-Program for Air Pollution Control caused by Motor Vehicles.
  - Ecologic characterization of bodies of water: rivers Mogi-Guaçu and Pardo, Sorocaba, Atibaia; estuary and Santos bay.
  - Ichthyofaunistic studies: Paraná River (Itaipú Binacional), Barra Bonita Reservoir, estuary-lagoon complex in Iguape-Cananéia.
  - Studies of the mangroves in the lowlands of Santos.
  - Bio accumulation of toxic substances in aquatic organisms: rivers Mogi-Guaçu and Pardo, Santos bay and estuary, Cubatão River, Barra Bonita and Billings Reservoirs.
  - Toxic evaluation of industrial effluents and surface waters in Greater São Paulo: Cubatão, Piracicaba, and Paraíba do Sul river basins.
  - Evaluation of the level of the populations exposure to chemical agents in Greater São Paulo, Cubatão and Vale do Paraíba.
  - Program of Particled Material Control in Greater São Paulo Establishing PROCOP-Program for Pollution Control in the State of São Paulo.
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CONSTRUINDO UM FUTURO MELHOR

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