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DIEMME SOIL WASHING



Soil Washing Plants



DIEMME SOIL WASHING

DIEMME SOIL WASHING S.r.l. is a reality established in 2011 by the reorganization of **DIEMME S.p.A.**, the historic company with an almost century-old operational experience in the solid-liquid separation sector.

DIEMME SOIL WASHING is the only Italian company to offer a complete portfolio of plants for the treatment of contaminated soils and sediments, waste treatment from different types of pollutants with the application of Soil Washing process technology.

The company is able to position itself as an EPCI (Engineering Procurement Construction Installation) Contractor with the capabilities to follow the customer in all stages of project development, from the early stages of engineering to installation and start-up phases on site, for a total and complete "key in hand" supply of the plant.

Every aspect of the plant is studied in a functional way to the specific needs in terms of legislative and environmental constraints, production capacity, treatment process and features of the reclamation site.



INDUSTRY 4.0

All **DIEMME SOIL WASHING** systems are equipped with PLC (Programmable Logic Controller) control and command equipped with a communication board.

The systems are thus prepared for remote communication and teleassistance or for interface with the corporate network, making them suitable for the recent legislation in force on **INDUSTRY 4.0**.



AFTER – SALES SERVICES

DIEMME SOIL WASHING S.r.l. offers a wide range of Installation and After - Sales Services on its plants, with qualified technical staff. You are offered the opportunity to take advantage of the services of:

- Installation and site work supervision;
- Testing, start up and dedicated training;
- Teleservice;
- Direct telephone support;
- Supply of spare parts;
- Scheduled maintenance;

attending if necessary directly at the customer's installation site.

INTEGRATED MANAGEMENT SYSTEM

The focus on Quality, Workplace Safety and the Environment are the objectives that **DIEMME SOIL WASHING** has decided to pursue with the implementation of an Integrated Quality, Safety and Environment Management System, compliant with the specifications of EN ISO 9001, EN ISO 14001 and ISO 45001.

DIEMME SOIL WASHING after achieving the first EN ISO 9001 certification of its quality management system, has integrated the management of environmental protection and safety management aspects in the workplace, with the achievement of the OHSAS 18001 and EN ISO 14001 certification. The company recently also implemented the new ISO 45001 certification.



CUSTOMER SERVICE

Research and Development Laboratory

DIEMME SOIL WASHING carries out testing activities with its own internal laboratory equipped to perform specialized tests on the different matrices provided by customers.

The tests carried out from small amounts of matrix, allow to simulate the different stages of the analysed process.

The laboratory is spread over an area of 220 square meters divided into two spaces: one predominantly for chemical analysis on solids, liquids or suspensions and the other one experimental for filtration and separation tests.



Mobile Industrial Pilot Plants

DIEMME SOIL WASHING has built several laboratory pilot plants, and mobile industrial pilot plants, offering testing activity both at its headquarters, at the customer's headquarters or directly on the site to be treated.

Soil Washing Mobile Plant

It is made with modular units and it is provided with the most advanced equipment for environmental remediation through the Soil Washing process, making it capable of:

- Operational flexibility to treat different types of soils, sediments and matrices;
- Process modularity to clean up a wide range of contaminants with very variable concentrations;
- Representation of the behaviour of each individual matrix by gaining maximum knowledge of the obtainable operational results.



Stabilization and Solidification Mobile Plant

It allows to test the different formulations to achieve the stabilization/solidification of the contaminated matrices:

- Designed to operate in batches, it can verify and validate with representativeness the operational results that can be obtained on an industrial scale;
- It can process contaminated soils, sediments and matrices of various nature and origin.



Laboratory Filter press and mobile Filter press

Laboratory and mobile filters offer the possibility to carry out solid-liquid filtration tests:

- The first one in the R&D Lab allows to conduct tests in order to optimize the filtration process on specific needs;
- The second one skid-mounted, easily transportable and installable at any plant, allows for larger-scale operational tests, offering the opportunity to verify the functionality in the field.



SOIL WASHING AND SEDIMENT WASHING PLANTS

Operating principle of Soil Washing

Soil Washing is a flexible and proven process technology; considered for several years as the best available technique (BAT) for different contaminants including heavy metals and hydrocarbons.

The Soil Washing technology process is basically a process of volumetric reduction/waste minimisation, which allows you to achieve the following results:

- Separation of fine particles of soil that "host" contamination from the coarse soil fraction;
- Dispersal or solubilization of contaminants in the liquid phase and consequent removal of contaminants from the liquid for reuse in the process.

Contaminated soils are classified as grainy, washed and subjected to various dry and wet treatment processes that allow fine particles to be separated from gravel, sand

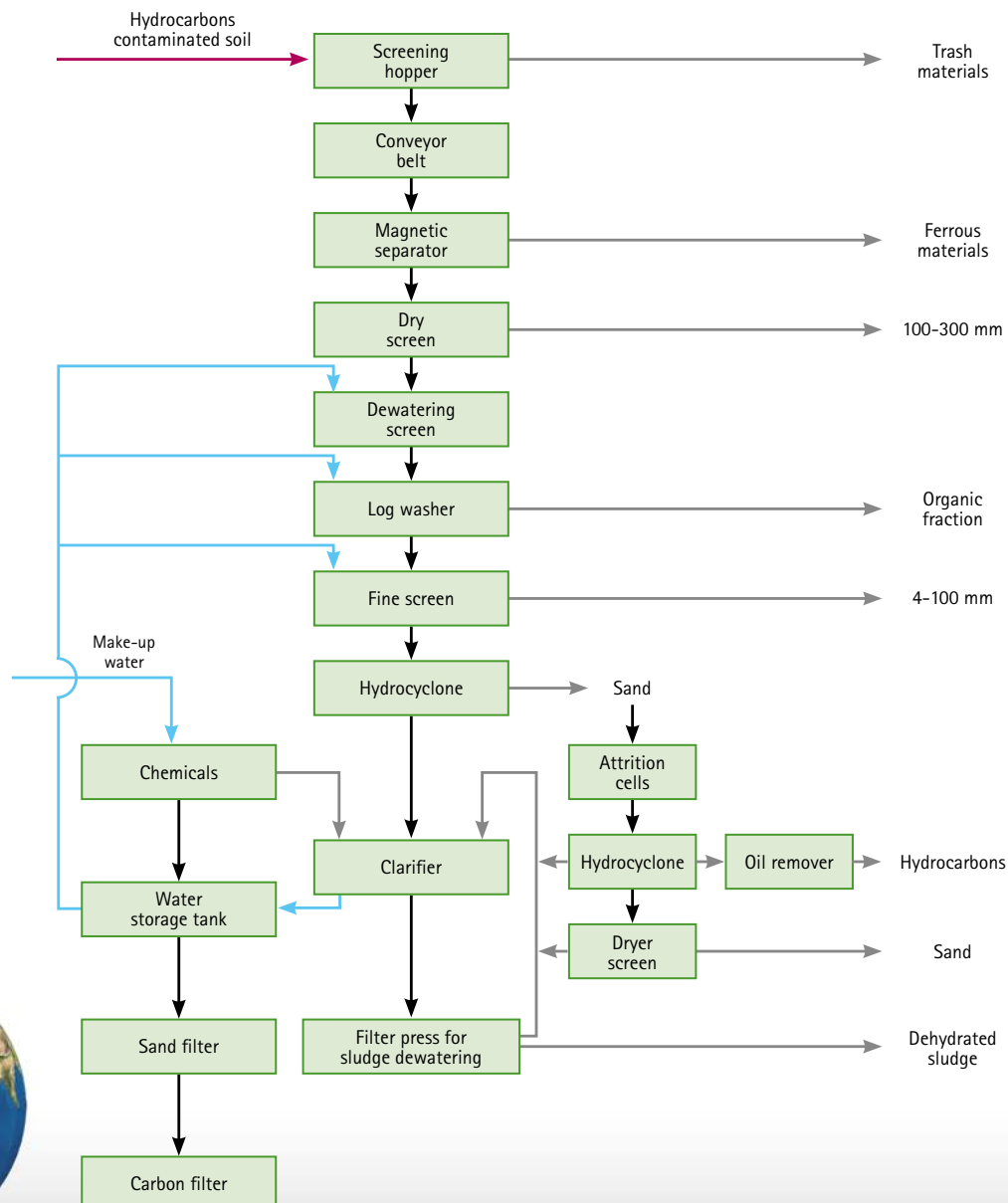
and coarse solids as contaminants tend to concentrate in such particles, such as silt/loam and clay, due to their high adsorbent characteristics.

During pre-treatment and screening, gravel, sand and coarse solids are cleaned and can be reused or reallocated to site, while contaminants still present in water and fine particles will go through the additional process phases, water treatment plant and sludge dewatering.

The Soil Washing and Sediment Washing plants are designed and built in stationary or mobile configuration according to the operational needs of each individual remediation project. The facilities are complete with closed-circuit water purification treatment and mechanical dehydration line.

Stabilization/solidification and inertization systems, road-sweeping treatment plants and sewage sands complete the range of supply.

FLOWCHART: HYDROCARBONS DECONTAMINATION



Stationary Plants

The technological development of the process carried out by **DIEMME SOIL WASHING** makes this technology economically advantageous even in particular industrial realities such as the treatment of contaminated matrices directly arriving at the landfill, where contaminated rocks and excavation soil are treated directly, allowing the recovery of the gravel, sand and the disposal of only a small amount of waste.

A stationary industrial plant for the treatment of soil or sediment is built:

- For remediation of a very large area that contains a large amount of contaminated material;
- As an integral part of a multipurpose waste treatment and recovery centre that can be used for an extremely wide range of EWC codes;
- To be fed with processed residues and waste from other technological lines;
- To become a versatile and efficient high-tech platform, which can pre-treat a wide variety of contaminated matrices, preparing them for other processes and new uses.



Mobile system

The need to treat more and more potentially contaminated soils and sediments, in remote areas or far from fixed plants, has highlighted the need of mobile, extremely flexible systems, with reduced mobilisation and de-mobilisation times.

DIEMME SOIL WASHING has responded to this market need by engineering and manufacturing a new set of multifunctional plants, which offer the following benefits:

- Treatment capacity and work flexibility equivalent to that of fixed implants;
- Ease of transport thanks to the containerized modular design of the operating units;
- On-site installation speed because each module is functionally autonomous, greatly reducing subsequent site activities by achieving tight de-mobilisation times;
- Simplicity of re-adaptation and reuse at another treatment site.

These plants are also suitable for the treatment of medium-small areas, logistically unfavourable, as they are naturally adaptable to the most varied needs of each individual customer.

TREATMENT AND RECOVERY OF ROAD SWEEPING, SAND FROM SEWAGE TREATMENT PLANTS

DIEMME SOIL WASHING has developed plants with a process of treatment and recovery of soil from road sweeps and sewer sands that allow to greatly reduce the environmental impact generated by these types of waste, offering the following benefits:

- Recovery of a high fraction of second raw material, End of Waste (> 70%);
- Reduction of the class of risk of waste produced and consequent reduction of disposal costs;
- Volumetric reduction and concentration of pollutants;
- Reduced consumption and optimization of the use of chemical additives by monitoring and automated management of the treatment process;
- Compliance of the materials produced with the legal requirements for the classification End of Waste and product compliance with the reference technical standards;
- Closed water circuit with waste water treatment and its recirculation at the head of the plant;
- Reduction of the short-term and long-term environmental impact thanks to the saving of resources given by the re-use of secondary raw materials and the reduced use of landfill.

The treatment of such waste differs from the traditional Soil Washing for the peculiarities typical of the incoming matrix, for the variability and seasonality of waste and for the presence of contaminants spread throughout the treated grain spectrum, which made it necessary to develop a specific and dedicated competence for this type of plant.



The treatment and recirculation of process water inserted inside each plant allows to minimize the use of clean water, reducing its consumption and containing the costs of ordinary management.



Sand



Gravel



Dewatered silt and clay



Metal scrap



SLUDGE TREATMENT PLANTS AND WATER CLARIFICATION

DIEMME SOIL WASHING can design and manufacture, together with filtration, complete sludge and water treatment plants including:

- Chemical conditioning system;
- Water clarification section;
- Water sedimentation section;
- Sludge and clear water Storage;

offering integrated solutions including assisted start up.

The plants are customized for the most complex needs of the customer and can include:

- Individual sludge conditioning reactors;
- Mixed Multi-compartmental stir-tanks;
- Static clarifiers;
- Dynamic scrapers bridge clarifiers or lamellar clarifiers.

DIEMME SOIL WASHING has recently developed in the field of contaminated waste treatment, water filtration systems, for filtration and finishing of plant and process water.

These units consist of a series of fully automatic quartzite and activated charcoal filters, PLC-controlled, equipped with washing and dosing system, making them complete, compact and available to be easily placed on site.





Installation on site

DIEMME SOIL WASHING is able to follow the entire installation, testing and start-up phase for each plant, offering dedicated assembly or supervision services.

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Diemme Soil Washing S.r.l. reserves the right to bring any alteration at any time which is deemed to be necessary in order to improve its production.

NOTE: the photos used for the realization of this brochure refer to supplied plant.

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