

INDUSTRIAL PROCESS OF MUNICIPAL SOLID WASTE (IP-MSW)

Clean Technology for Waste Disposal

Description

Modern life has brought substantial benefits to people around the world and at the same time has developed human organizations that are permanently producing and disposing incredible quantities of waste.

The Municipal Solid Waste disposal has become a high priority for governments and authorities of every country and city in the world who have partly resolved the problem by installing modern MSW Landfills. Unfortunately the many problems encountered with Landfills are growing permanently and the public opinion has a negative perception of Landfills and its environmental impact.

The most serious problem with Landfills is that construction of each landfill cell will create enough pressure over the underlying cell converting a high percentage of the organic content into leachates and Methane. The leachate are kept under relative control in side pools for years due to rain fall that compensates leachate evaporation.

Leachate are highly toxic because contain heavy metals and multiple other dangerous elements that can contaminate man water supply and food cycle and crops through different mechanisms.

Leachate could have a serious negative impact in food exports to countries where Chile is taking advantage of the many free trade agreements that clearly establish the condition that products for human consumption will not be accepted by those countries if they are produced closer than 10 kilometers from a Leachate source.

One other important problem in Landfills are the high levels of GHG (greenhouse gas) emissions: 0.9 metric tons of CO₂ e per each ton of waste contributing to global warming in a constant and dangerous way.

The constant accumulation of waste has become a major environmental problem in Chile and all other countries in the world and there is an urgent need to provide the industry with cleaner more friendly disposal systems that will drastically reduce the environmental impact.

TRYGER Ltda. has developed a new technology to convert the Municipal Solid Waste (MSW) into an inert material called DRUX that among important physical characteristics can be also used as raw material for products that can be used in the building industry. The industrial process to convert waste into drux has been developed and a plant of 6,5 metric tons per hour that complies with environmental regulations is presently installed in Villarrica that could serve Villarrica and the surrounding municipalities.

The industrial process to convert MSW into drux starts with a grinding process followed by addition of chemical products that serve as binding agents, hardeners and sanitizers. The end product is a moulding material called drux. drux can be utilized to manufacture building asphalt roads (primary use), blocks, panels, covers for pedestrian ways, etc.

The drux process reduces the total volume of landfill to be occupied by the MSW because the density of the end product has an important increase of

approximately 70%. Together with this physical improvement the drux material process is also an important contributor to the reduction of leachates and GHG emissions.

The Tryger Ltda. process is protected by patents which confirm this is an innovative and new technology.

The value of this technology can be observed from two perspectives: the MSW treatment process and the end product obtained from this process. The main difference with other technologies available around the world is related to the pre classification step which is not part of the Triger technology and is characterized by the direct feed of MSW as is into the physical & chemical stages.

The main advantages of this process versus others are:

- ✦ The MSW is converted into a different material called drux that can be utilized as a base for building materials.
- ✦ The GHG (greenhouse gas) emissions are practically eliminated.
- ✦ Leachate is dramatically reduced to minimal levels
- ✦ Dramatically reduces the presence of pathogenic microorganisms
- ✦ Drastic reduction of all types of animals and insects that carry all different and serious diseases.
- ✦ Reduces to minimum levels the leaching of heavy metals
- ✦ Can complement and in some cases eliminate traditional Landfills with big environmental and technological advantages.
- ✦ The site is better protected for future uses due to the drastic reduction of contaminants present in the area.

To solve waste disposal with an environmentally safe technology is highly necessary to support the country's export program to expand and position different products in international markets. Free Trade Agreements have helped to expand the market potential for these products and is necessary also to develop new and safer technologies to advance into clean and sustainable production.

Tryger Ltda. is offering a new and modern technology of waste disposal that can improve the total profitability of projects by offsetting the higher costs with additional product offering to the market such as light topping pavements, impact and sound absorbers, building panels, etc. .

PATENTS

Chile	200602530
USA	US 8,337,381B2
EP	2179801
Germany	EP(DE)3179801
UK	EP(UK)2179801
Brasil	BR 12 10 2012 004884-1
PCT	IB2007004724

DRUX A NEW MATERIAL IN THE BUILDING INDUSTRY

Uses of Drux: Filler for Asphalt Pavements

GHG EMISSIONS

Drastic reduction of GHG Emissions is obtained through the application of this technology. Each metric ton of RSD is responsible for generating 0.9 metric tons of CO₂ e).

A forest can reduce from 3 to 8 tons of CO₂ e per hectare/year. A 14 ton /hour plant could replace 285.0000 hectares of forest /year.

The Company.

Tratamiento y Gestión de Residuos Ltda., Tryger Ltda., is a Limited Liability Company with Headquarters in Santiago de Chile and a subsidiary in Villarrica

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