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CHRISTIAENS GROUP



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WE MAKE YOUR WASTE VALUABLE

Organic waste products are easily degraded by a diverse range of micro organisms. However, when this process takes place inside a 'closed box' it is possible to control all parameters involved in this process. With the knowledge derived from the mushroom industry the Christiaens Group developed an in-vessel composting system for all kinds of waste. The specially designed Christiaens Control system is able to control a variety of important parameters such as temperature, oxygen level and air pressure. By means of fan speed and damper control it is possible to improve the in-vessel conditions. When the 'Christiaens Controller' is properly set, the composting system starts with the decomposition of easily degradable organic matter. During this process a large amount of heat is generated. Due to this heat release the temperature in the material can rise to over 70°C. Under these conditions large quantities of water are evaporated.

Besides optimising the in-vessel composting system the Christiaens Group also had eye for further mechanisation of the total composting plant. In 1992 the Christiaens Group for the first time patented an automatic system for filling and emptying of the composting tunnels.





HAMILTON CENTRALIZED COMPOST FACILITY

UNDER CONSTRUCTION



Local dignitaries lead a groundbreaking ceremony for the new compost plant.

Maple Reinders, along with key project partners Associated Engineering, Aim Waste Management and The Christiaens Group of the Netherlands, has undertaken a benchmark Design/Build/Operate project to create a new centralized compost facility for the City of Hamilton. The 115,000 square foot in-vessel composting facility will process 60,000 tonnes of residential curb-side wet waste into a rich, organic soil material - in the City of Hamilton's terms - "Black Gold. The new compost facility will help the City achieve its mandate to divert its current solid waste stream by 65% by the year 2008. The Hamilton composting process resembles typical backyard composting, but is accelerated using science and automation:

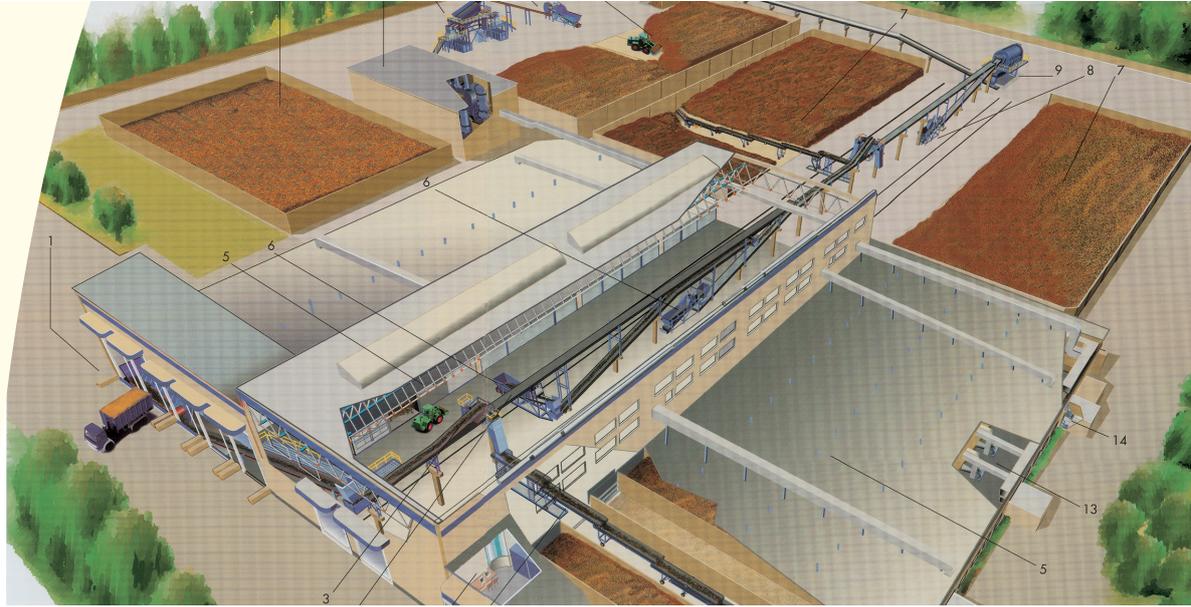
Collection: Organic waste is collected in a "green cart" at the curb, and transported to the new facility, where it is unloaded, shredded and conveyed to an empty compost tunnel through roof openings. An automated filling cassette travels the length of the tunnel to ensure even distribution.

Phase 1 Composting: Once the tunnel is filled, the ageing process commences. Foul air is recycled, and only a small amount is exhausted through a large organic biofilter. After 7-10 days, the tunnel is emptied and the Phase 2 tunnels are filled.

Phase 2 Composting: Phase 2 tunnels allow the compost to mature for an additional 7-10 days. Once complete, loaders remove the compost from the tunnel to be screened for all unacceptable materials, and refined to a specific marketable size. After screening, the compost is conveyed to an outdoor covered curing area.

Final Product: After curing, the compost is shipped to outlying markets, such as local nursery operations, for potting soils. The environmental benefits of such a bold composting program are self-evident, but extra value will be realized by turning waste into a marketable, profitable end product.





NANGONG COMPOSTING PLANT

NANGONG COMPOSTING PLANT

Christiaens Machines B.V. has been an established name in the world of waste treatment for many years. Thanks to their huge experience in export all over the globe and equally important their pioneering spirit Christiaens Machines B.V. was asked to engineer and supply 2 filling lines for a compost plant to be newly built near Beijing, China.

The entire project comprised 2 reception and sorting plants in the city and one large composting plant where organic waste from the 2 sorting units is processed into compost.

Composting capacity: 120,000 tons / year

Number of tunnels: 30

Process: 2+3+3+10 weeks

Usable compost after 7 weeks: 39,000 tons / year.



RAB

RAB is an Austrian engineering agency specialized in providing advice and guidance to local authorities and companies on setting up waste composting installations. The designs are made according to a pre-determined concept. Part of the concept is the supply of pre-sorted waste to the tunnels and filling the tunnels.

Christiaens Machines was approached to design a tunnel filling cassette that fitted into the basic tunnel already designed by RAB. The first order to supply 2 tunnel filling cassettes was granted in 2002. "As well as the most competitive price, Christiaens offered the best technical solution and support".

Project

ASA Halbenrein
St Pölten
Palm Meadows
Lahti

Country

Austria
Austria
USA
Finland



HOURSEMANURE COMPOSTING PLANT PALM MEADOWS FLORIDA





MEAB BERLIN PROJECT



Linde KCA is a daughter company of Linde AG active in environmental engineering and implementation of total waste treatment installations, mainly for municipal solid waste. Constructing waste composting tunnels, combined if requested with methanization plants, is their specialty. Since 2000 Linde KCA has used automatic tunnel filing/emptying machines from Christiaens Machines and automatic tunnel doors supplied by Christiaens Construction. Control systems are supplied by Christiaens Controls. Christiaens Group and Linde KCA recently entered a partnership. In the future, both partners will be closely collaborating on offering and constructing waste composting projects throughout Europe.



COMPOSTTUNNEL LINZ AUSTRIA



EGW KREIS BORKEN



BERLIN / SCHÖNEICHE



PROJECT VILLENA SPAIN

PROJECT	COUNTRY	NUMBER OF TUNNELS	CAPACITY TONS/YEAR	YEAR OF COMPLETION
EGW Kreis Borken	Germany	26	85.000 ton	2000
Ecoparc Barelona	Spain	29	300.000 ton	2002
Villena	Spain	16	40.000 ton	2003
EGW Kreis Borken	Germany	-	115.000 ton	2004
Stadt Linz	Austria	16	85.000 ton	2004
Leipzig / Cröbern	Germany	44	300.000 ton	2005
Berlin / Schöneiche	Germany	30	180.000 ton	2005
Cap Lorient	France	22	55.000 ton	2005
Lille	France	22	110.000 ton	2006
Erfurt	Germany	12	90.000 ton	2006
Fridhaff	Luxemburg	18	37.500 ton	2006



BANFF, ALBERTA, CANADA

The Town of Banff decided to expand and upgrade their existing Wastewater Treatment Plant (WWTP), through the use of the Design/Build/Operate (DBO) project delivery model. The DBO project delivery model presented a unique opportunity for the Town of Banff to truly find the most efficient process to meet its needs. In order to be successful the proponent needed to select the most effective design based on both the capital as well as the long-term operational costs. The DBO team included Earth Tech (Canada), Maple Reinders (Canada) and Christiaens Group (NL). The tunnel composting system utilizes aerated static pile technology, and is based on a process-control system developed by the Christiaens Group. The control system allows a high level of control over all phases of the composting system and requires little operator attention over the 21-day composting cycle.



PRINCE ALBERT, SASKATCHEWAN, CANADA

The Prince Albert composting facility, is designed by Earth Tech (Canada) and the Christiaens Group (NL) in order to treat sewage sludge. The facility is operated by the city of Prince Albert. Much effort is put in to the design of the aeration system. At the end of the aeration system an ammonia scrubber and biofilter are incorporated. Woodchips are mixed through the sludge to improve the 'compostability'. This mixing is done inside the building due to the extreme temperatures which can be reached outside (-40°C).





aha HANOVER, GERMANY

STARTING UP

In this facility, 120.000 t/a of MSW is collected and separated. The small, organic fraction will be treated anaerobically in order to derive methane gas. The residue which comes out of the anaerobic digesters is going into the Christiaens Composting Tunnel system, these tunnels will aerobically treat this material. Special feature in this plant is the automatic emptying system; the material is taken out of the tunnels by means of the patented Christ Floor system.

This plant is designed in a environmentally and sustainable way in close cooperation with Weser Engineering (Germany).



GROUP OWNED TEST FACILITY

For development of new composting systems and for optimising the processes, the Christiaens Group has its own testing facility. This facility consists out of two small, lab scale, containers ($\pm 2m^3$) and one big container ($\pm 40m^3$).





Christiaens Group

THE POWER OF COMBINED EXPERIENCE

ANIMAL MANURE

Belgium	Op de Beeck La Vrijsen	Antwerp Bree
The Netherlands	Van Rens Nies Peelen Janssen Vaessen Meevis Van der Kruys-Pennings Classens Tewierik Philips Bongers Van Geneijgen	Hegelsom Kelpen Meerlo Meerlo Horst Nederweert Nederweert Oirlo Raalte Swartbroek Weert Weert
Portugal	Cooperativa Avicola do Centre S.A. Cavican	Santiago da Guarda Bidoeira de Sima
USA	GPRA Thoroughbed Training Centre Inc.	Palm Meadows Florida

MUNICIPAL SOLID WASTE (MSW)

Austria	ASA Abfallservice Halbenrain GmbH & co Nfg KG ESG Stad Linz MBA St. Pölten	Halbenrain Linz Sankt Pölten
Finland	Kujalan Komposti Oy	Lahti
France	Chantier CVO Cap L'Orient	Lille Caudan
Germany	MEAB egw RABA Erfurt –Ost MBA Cröbern	Berlin Borken Erfurt Leipzig
Luxemburg	Region Luxembourg	Fridhaff
Spain	Ecoparc 1 VAERSA	Barcelona Villena

ANAEROBIC DIGESTION RESIDUE

Germany	aha avea	Hanover Engelskirchen
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SEWAGE SLUDGE

Canada	Banff WWTP City of Prince Albert Regional Municipality of Wood Buffalo	Banff, Alberta Prince Albert, Saskatchewan Fort McMurray, Alberta
Spain	GTR GTR	Barcelona Blanes
The Netherlands	GMB GMB	Tiel Zutphen
UK	Anglian Water	Ipswich
USA	BFI	Unity

BIOWASTE

Belgium	DDS-Verko	Dendermonde
Canada	City of Hamilton Region of Peel	Hamilton Toronto
Germany	Schneider Emsland WGV WKG	Gießen Meppen Quarzbiehl Würzburg
The Netherlands	Kaathoven Kaathoven Ogar RAZOB RAZOB	Bladel St. Oedenrode Oude Pekela Acht Deurne
UK	Viridor Waste Management Ltd.	Beddington

Christiaens Group

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