Alternative Fuels 1/3

New and Alternative Fuels

Obtaining energy from so-called waste materials has been a hot topic for some considerable time. A new market has developed from it and with this a new process technology as well. In almost all calorific systems more and more so-called alternative fuels are also being used in the production of energy, along with refuse and conventional fuels such as oil, coal and gas. The range of these new or solid fuels is huge and is continually being extended.

The most important alternative solid fuels are:

- animal meal
- Sewage sludge
- Waste wood
- Shredded bark
- Sludges from paper production
- Plastics
- Tobacco dust
- Scrap tyres
- etc.

The following illustrated examples of usages procure the core competence of STAG with regard to process technology. We are the professionals when it comes to demanding variants in bulk materials technology.

The difficulty in handling these materials is the great variety, even within the same group of materials. Thus animal meal from Producer A is not necessarily comparable with that from Producer B. Arising from this hurdle, STAG has developed a universal concept that completely fulfils all the demands accompanying such a great variety of products.

Satisfied customers are our best advertisement

Holcim Switzerland

Utzenstorf Papier

VIGIER

von Roll INOVA

In all of Europe there are different complete plants that are available to you at any time as references.

Bulk material technology
Pneumatic and mechanical conveying technology, storage technology

STAG AG
Industriestrasse 11
CH-7304 Maienfeld
Tel: +41 (0)81 303 58 00
Fax: +41 (0)81 303 58 99

www.stag.net
office@stag.net

Reg.No: 81052 / 02.03

Animal meal

The usage of animal meal in great quantities as a fuel is a completely new application. In the past, animal meal from the processing of animal carcases had only been used as an alternative fuel in isolated cases, or it had simply been disposed by means of burning. The recent BSE scandals have caused a real flood of it to be released and as a result it is now being used in the cement industry, as well as in refuse incineration or in power stations for the paper industry.

Process technology

Handling
The animal meal, bone meal, meat meal or other mixtures thereof display very different properties according to the way in which they were produced. This broad range of specifications must be taken into account when handling. In this, the fat and water content is the factor of prime importance.

Delivery
Delivery is generally carried out using bulk carrier HGVs. When unloading, heed is to be taken of some fundamental parameters, such as the temperature of the air used in conveyance and the structure and sizing of the conveyor pipe lines.

Storage
For reasons of hygiene, the meal is mostly stored in closed cylindrical silos having special mechanical discharge devices. Depending on the volume involved, silos can be used that are fitted with special cone dischargers (STAG-SiLex) or with flat-bottomed discharge systems.

Transport / Metering
Depending on the system configuration, pneumatic or mechanical transport will be necessary in order to meter the product feed into the incinerator. For mechanical transport systems, troughed chain conveyors will mainly be used. In the case of pneumatic transport, both the dense flow method and the continuous thin flow method will be suitable. Here the routing of the pipeline in use, plus the material of which it is constructed, will have to be given particular attention.

Technical data:

Silo volume	80...150	m^3
Conveying rate	1'000...7'000	kg/h
Conveying distance	20...150	m
Metering	volumetric or graphimetric	

STAG Sàrl
7, rue de Flachenbourg
FR-67100 Strasbourg
Tel: +33 (0) 3 90 40 43 90
Tel: +33 (0) 3 90 40 43 92

www.stag.net
office@stag.net

STAG GmbH
Lilienthalstrasse
DE-66740 Saarlouis
Tel: +41 (0) 81 303 58 00
Tel: +41 (0) 81 303 58 00

www.stag.net
office@stag.net

Alternative Fuels 2/3

Sewage sludge (SS)

Sewage sludge from the council's sewage treatment plant has been used as a fuel for as long as 15 years. It is burnt in cement works, power stations for the paper industry, as well as in conventional refuse processing plants. STAG's many years of experience in dealing with various types of sewage sludge, each dependant upon its particular proportion of solids (solid matter content), ensure the most suitable technical and economic solution for each customer's specific requirement.

Process technology

Handling
The handling of various types of sewage sludge is above all dependent on the solid matter content. Sewage sludge is very abrasive and, depending on the solid matter content, is prone to fermentation during usage. Particular attention is to be paid to these properties when preparing the concept for a plant.

Storage
For reasons of hygiene, silo storage is mostly achieved using closed cylindrical silos having special mechanical discharge devices. Depending on the volume of the silo and its solid matter content, silos can be used that are fitted with special cone dischargers (STAG-SiLex) or with flat-bottomed discharge systems. However, it is also possible for unloading to be open and for storage to be in bunkers that have special floor thrust discharge systems. Above all, attention is to be paid to preventing fire or explosion.

Delivery
Delivery is carried out between the two plants, mostly using mechanical conveyance systems. In the main, troughed chain conveyors and conveyor belts, but in addition worm conveyors, are suitable as means of transportation. Due to the high abrasiveness of sewage sludge, particular attention is to be paid to protecting the conveyor units from wear.

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Technical data:

Silo volume	60...450	m^3
Conveying rate	1'000...7'000	kg/h
Conveying distance	20...150	m
Metering	volumetric or graphimetric	

Transport / metering

Depending on the system configuration, pneumatic or mechanical transport will be necessary in order to feed the product into the incinerator. For mechanical transport systems, mainly troughed chain conveyors will be suitable. In the case of pneumatic transport, the dense flow method will mainly be used. Continuous thin flow methods will be used for injecting the product into the incinerator. Here the routing of the pipeline in use, plus the materials being used, will have to given particular attention.

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Alternative Fuels 3/3

Sludges from paper production, tree bark

Tree bark accrues mainly during preparation of raw materials for the paper industry. On the other hand, paper sludges are waste products generated by paper manufacturer's clarification plants. Both are high quality fuels that are mostly fed into the incinerators of their own power stations. Due to our involvement in the paper industry, we are able further to expand our experience in the handling of these products. For the nature of your task we are equally willing to work out a suitable technical and economical solution.

Process technology

Handling
The handling of paper sludge and tree bark is something special, because the properties of the product continually change due to flexibility in production.

Storage
Storage is mainly in bunkers that have special floor thrust discharge systems or in stacking silos of flat-bottomed construction and having sliding frame discharge systems.

Technical data:

Silo volume	150	m^3
Conveying rate	1'000...12'000	kg/h
Conveying distance	20...150	m
Metering	volumetric or graphimetric	

Delivery
Delivery is carried out between the two plants, mostly using mechanical conveyance systems. In the main, troughed chain conveyors and conveyor belts, but in addition screw conveyors, are suitable as means of transportation. Particular attention is to be paid to protecting the devices from wear when handling these to an extent very abrasive materials.

Transport / Metering
Transport is achieved using mechanical conveyance systems. For this, principally the troughed chain conveyor is the most suitable. Metering is carried out using screw feeder (volumetric), belt scales or loss in weight feeder. It is important to keep these systems ventilated.

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Waste wood and plastic waste

Waste wood and plastic waste are high quality fuels that are mainly burnt in the cement industry, but also in conventional refuse processing plants. Waste wood is mainly generated by industry and the woodworking trade. Plastic waste mainly comes from the disposal of packaging materials.
The above-named branches of industry have counted for years as our most important areas of activity. Our customers' confidence in us, plus our experience in handling other difficult alternative fuels has both boosted and endorsed us in the handling of various projects.

Process technology

Handling
The properties of waste wood and plastic waste are not easy to tie down. Due to the different origins, the specification is likewise very different. One important aspect is always the level of dust proofing necessary for the plants. Both products are contaminated and contain a proportion of fine dust that cannot be ignored.

Delivery
Delivery is mainly carried out in containers or closed lorries, though also through internal fragmentizing plants. For transportation to interim storage it is mainly troughed chain conveyors, conveyor belts or canvas sling conveyors that are suitable.

Storage
Storage is in bunkers that have special floor thrust discharge systems or in stacking silos of flat-bottomed construction and having special discharge aids.

Transport / Metering
Depending on the system configuration, pneumatic or mechanical transport will be necessary in order to feed the product into the incinerator. Troughed chain conveyors, conveyor belts or canvas sling conveyors are suitable means of mechanical transportation. Where greater distances are involved (up to 300 m), pneumatic conveyance systems are feasible. Injection into the incinerator is always achieved using a continuous thin flow method. The product delivery is made via a cellular wheel sluice by means of an injector. Particular attention needs to be paid here to the pipeline in use and to the material used in its construction. Belt scales, configured according to the product being carried, are suitable for the metering of these products.

Technical data:

Silo volume	100...300	m^3
Conveying rate	500...2'000	kg/h
Conveying distance	20...300	m
Metering	graphimetric	

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