

ENERGY RECOVERY PROJECTS FOR EXTRUDER AND DRYER PROCESS OPERATIONS

PRESENTED BY GRAINTEC A/S

Designers and builders of feed/food extruder process plants



Production of extruded feed/food is energy consuming. Graintec has developed and installed a number of successful energy saving solutions.

This newsletter presents some solutions to reduce energy consumption. In addition some of the solutions have a positive effect on the odour emission from the drying process.

We hope that this newsletter inspires you to consider the possibilities of reducing energy consumption for the benefit of your economy and the environment.

In some countries tax relief or reward schemes are provided to reduce the initial investment. (See below).

Please do not hesitate to contact us for more information, quotations and surveys. Contact details can be found below.

Country	Government reward schemes and tax relief – more information
Denmark	http://www.ens.dk
Chile	http://www.ppee.cl and http://www.corfo.cl
UK	http://www.businesslink.gov.uk
Norway	http://naring.enova.no
Netherlands	http://www.senternovem.nl
Belgium	http://www.energiesparen.be/subsidies

DRYING

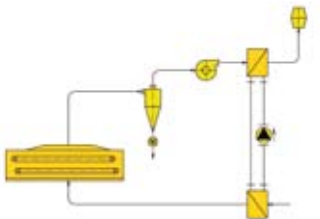
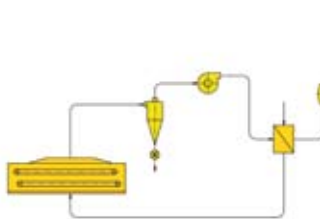
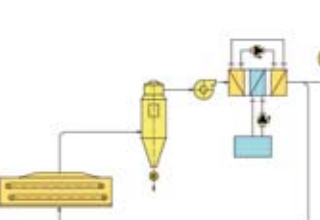
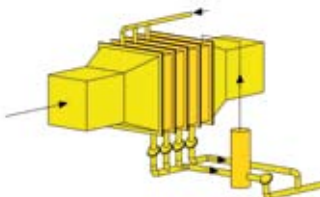
Drying of extruded feed/food accounts for up to 65% of the total energy costs for production of extruded products.

Energy loss is caused by:

- Water evaporation. This typically accounts for the major part of the energy consumption
- Loss of energy through air exhaust
- Convection loss in dryer, ducts and cyclone
- Steam heat exchanger(s) and boiler

Potential energy savings at drying are therefore substantial. Graintec presents below some solutions to reducing the energy consumption at drying.

ENERGY SAVINGS FROM DRYING PROCESS AND STEAM HEAT EXCHANGERS

Description of solution	Schematic solution	Incentives	Economy based on 4,000 operation hours per year
Recovery of energy from dryer exhaust air with air/water heat exchangers		Lower energy consumption for drying. Lower temperature and less volume in exhaust air.	Savings: 1,000 – 1,500 MWh/year for a 10 tons/h dryer. Investment: EUR 100 – 200k per dryer.
Recovery of energy from dryer exhaust air with air/air heat exchangers		Lower energy consumption for drying. Lower temperature and less volume in exhaust air.	Savings: 1,200 – 1,600 MWh/year for a 10 tons/h dryer. Investment: EUR 75 – 150k per dryer.
Recovery of energy from dryer exhaust and reduction of odour emission from drying		Reduce energy consumption. Reduce odour emission from drying. Better control of make-up air (uniform drying conditions).	Savings: 700 – 1,000 MWh/year per dryer plus 75% less air exhaust to atmosphere for a 10 tons/h dryer. Investment: EUR 600 – 900k per dryer.
Recovery of energy from steam heat exchangers (Re-vaporization of excess steam in the condensate)		Reduce steam consumption. Reduce energy consumption. Reduce steam overpressure in condensate lines.	Savings: 200 – 300 MWh/year per steam heat exchanger with a capacity of 1000 kg/hour (approx. 600 kW) Investment: EUR 7 – 10k per steam heat exchanger.