



Wednesday, April 01, 2015

Environment Act Licence No. 820 RRRR

Malteurop Canada Ltd

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204.943.0741

Manitoba CWS

Environmental Approvals Branch

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Re: Notice of Alteration, Minor Environmental Effect - Malthouse 2 heater & heat exchanger replacement.

1.0 Project Description:

Malteurop Canada Ltd. operates a malt plant on the eastern outskirts of Winnipeg, which processes over 100,000 tonnes of barley per year into malt. The process is essentially the forced germination of barley adjusting its moisture content and temperature and using the natural enzymes in the kernels to convert the starch in the kernels into sugars. This process is mildly exothermic, and will continue to completion with the sprouts depleting the sugar content in the kernels and producing new plants if allowed to. The conversion of the starch to sugars is interrupted at the peak sugar content stage by dehydrating the kernels in a high temperature kiln, and the dry malt is sold to breweries and distilleries for use in the making of beer and liquor.

Kilning the malt basically involves raising the temperature and air flow rate through the green malt to reduce the moisture content from approximately 46% w.b. to 3.5% - at which point the enzymatic activity is reduced to zero and the malt is storable. This stage is by far the most energy intensive of the 4 stages of production, and is the focus of this study. Further, this project is examining the application of heat recovery technology to one of the 3 operating plants at this site – Plant #2. The other two (Plants #1, and 3) already have heat exchange equipment in operation.

1.1 Current Operating Status:

Kiln #2 is currently operating without any form of heat recovery on the exhaust gas air stream. The kiln is a double deck unit which holds 2 batches at a time - one of which is replaced every 24 hours. Heated air flows first through the lower "curing" deck (which is in its second 24 hour period), then through the upper "withering" deck (which is in its



first 24 hour period). The lower deck is emptied each day, and the upper deck drops to the lower deck position. The upper deck is refilled each day with a new batch of green malt. A single set of induced draft fans is located above the upper deck discharging high humidity air directly to the outside, and drawing air through the indirect, gas fired air heaters located on the main floor.

There had been an early development stage exchanger installed in the mid – 1980's, however, the technology had not yet reached the fully functional stage with constant fouling of the exchanger surfaces with suspended particulate matter adhering to the wetted (from condensation) surfaces of the exchanger. There was also no preheating of fresh air ahead of the exchanger to prevent freezing the exchanger during our severely cold winter weather. It was removed from service approximately 10 years ago.

1.2 Addition of a Heat Exchanger

Installation of an air to air heat exchanger across the fresh air, make-up air stream, would permit recovery of a portion of the energy contained in the exhaust gas. This gas is low temperature at 24 to 26 °C, but approximately 98% humidity, making recovery of latent heat possible at low ambient temperature.



2.0 Malthouse 2 heater & heat exchanger replacement project.

Stainless Steel Tube Heat Exchangers
Anox burner system for indirect heating

The total heating capacity will be 8'800 kW (2 units with 4'400 kW each). The design of Flucorrex Varinox indirect air heaters is based on a kiln air flow of 357'000 m³/h @ 20°C and 250 m a.s.l. equivalent to 420'000 kg/h.

Describe what is currently licensed:

Item 8. NOx limits on heaters - < 26 grams per gigajoule of energy input

	Existing	Proposed
AIRFLOW	357,000m ³ /hr = 210,000CFM (54.1m ³ /min/MT or 41.5cfm/Bu)	
TYPE OF HEATING	indirect (gas fired ANOX heating units) 2units, 1 per kiln	VARINOX Indirect Kiln Air Heater 2 units, 1 per kiln
SIZE OF HEATING	5200 kW each	4400 kW each
Fuel	Natural Gas	
Max. flue gas temperature		650 °C
Combustion efficiency , based on LCV @ 70% heating load and design air flow	< 50%	100 % @ 20 °C kiln air
NOx	Not reported	<26 g/GJ or <49 ppm

Describe what is proposed:

VARINOX Indirect Kiln Air Heater

1.1 Technical Data

With this project 2 kiln air heater will be used. The technical data below refer to 1 unit only:

- Air heater type VARINOX
- Model FH4-210-087M
- Fuel: natural gas at 150 – 250 mbar
- Max. heating capacity 4'400 kW
- Min. heating capacity 750 kW
- Design kiln air mass flow 210'000 kg/h
- Kiln air pressure loss Δp (Design) 15 daPa
- Max. flue gas temperature 650 °C

Environmental impact:

Atmospheric – lower natural gas usage due to improved efficiency resulting in lower NOx, lower GHG, & reduced emissions.

- Attachments: [1003 138 A preliminary.pdf](#)
[2015-0039 S4.2 Section.pdf](#)
[2015-0039 S1.1 Key plan.pdf](#)
[2015-0039 A2.1 Main floor layout & pre heated air changer floor plans.pdf](#)



Please fast track approval of this request, and I look forward to hearing back from you. If you need more information or clarification don't hesitate to call me.

Respectively Submitted,

Tom Stiner
Plant Manager

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