

Notice of Alteration Form



Client File No. : 5,581.00	Environment Act Licence No. : 3056
Legal name of the Licencee: Custom Castings Ltd.	
Name of the development: Custom Castings Ltd.	
Category and Type of development per Classes of Development Regulation: Manufacturing Foundries	
Licencee Contact Person: Roger Dack Mailing address of the Licencee: 2015 Dugald Road City: Winnipeg Province: Manitoba Postal Code: R2J0H3 Phone Number: (204) 663-9142 Fax: (204) 663-9099 Email: safeccl@customcastings.com	
Name of proponent contact person for purposes of the environmental assessment (e.g. consultant):	
Phone:	Mailing address:
Fax:	
Email address:	
Description of Alteration (max 90 characters): Proceeding with planned upgrade; Gas fired furnace replacement.	
Alteration fee attached: Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>	
If No, please explain: Does not negatively impact the environment	
Date: 12/21/2016	Signature: Printed name: Roger Dack
<p>A complete Notice of Alteration (NoA) consists of the following components:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Cover letter <input checked="" type="checkbox"/> Notice of Alteration Form <input checked="" type="checkbox"/> 4 hard copies and 1 electronic copy of the NOA detailed report (see "Information Bulletin - Alteration to Developments with Environment Act Licences") <input type="checkbox"/> \$500 Application fee, if applicable (Cheque, payable to the Minister of Finance) 	<p>Submit the complete NOA to:</p> <p>Director Environmental Approvals Branch Manitoba Sustainable Development Suite 160, 123 Main Street Winnipeg, Manitoba R3C 1A5</p> <p>Formore information:</p> <p>Phone: (204) 945-8321 Fax: (204) 945-5229 http://www.gov.mb.ca/conservation/eal</p>



December 21, 2016

Tracey Braun, M.Sc.
Director
Manitoba Sustainable Development
Environmental Approvals
2nd floor 123 Main Street (Box 80)
Winnipeg MB R3C 1A5

Dear Ms. Braun,

Re: Notice of alteration – Environmental License No. 3056 – Melt Furnace Upgrade

This letter is to notify the director of our intention to advance the timeline of our upgrade project # 18 (replacement of gas-fired furnaces).

In Table 5-1R2 project #18 (see attached) our next furnace replacement was initially to commence in Q3 of 2017. We wish to proceed with the replacement in Q1 of 2017. This would leave us with two gas-fired melting furnace to replace or decommission, per our upgrade plan.

The gas-fired furnaces will be replaced by Morgan MKV Electric Resistance Bale Out Furnaces (see attached documentation)

If you have any questions or for more information, please contact me at (204)663-9142 ex:245

Regards,

A handwritten signature in blue ink that reads "R. Dack".

Roger Dack
Environment, Health, Safety & Continuous Improvement Coordinator
Custom Castings Ltd.
2015 Dugald Road
Winnipeg MB R2J 0H3
(204)663-9142

[CONSIDER IT DONE]

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Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
10	31-Aug-12	<ul style="list-style-type: none"> •Improve frequency of filter replacement in fume hoods. •Linked to Project No. 13 below. 	Complete	Pre-licensing (2012) frequency of flat-filter replacement dictated by when they clogged sufficiently to increase opacity in air accumulated within the hood ** Post-licensing filter-change frequency (Photo 1) now monthly; mass of particulate filtered out of atmospheric emissions is tracked (Table 1).	Jun-14
11	31-Oct-12	<ul style="list-style-type: none"> •Improve emissions capture at source from sand-core stations; install new fume hoods. 	Complete	High operating temperatures (1350°F) at furnaces causes highest rate of resin volatilization. Creating new fume hoods will increase capture from each casting station. **After investigation, it was decided to capture the fumes at source as localized collection is more effective than general collection. Fume-collection shrouds now installed on individual tooling (Fig. 5-2R1).	May-13
12	30-Nov-12	<ul style="list-style-type: none"> •Reduce number of open windows (and their room-air extraction fans). 	Complete	Improved air supply to worker stations near heat sources (e.g., furnaces) has reduced need for these windows.	Oct-14
13	30-Nov-12	<ul style="list-style-type: none"> •Improve performance of station-specific air filters in fume hoods 	Complete	1st trial proved ineffective. 2nd trial based on installation of filter boxes with replaceable filter media (Fig. 5-2R1). Mass of particulate filtered out of atmospheric emissions is tracked monthly (Table 1). •2 Mar 2015; filter change and tracking frequency increased to weekly (Table 1).	May-14
14	30-Nov-12	<ul style="list-style-type: none"> •Increase exit velocity of applicable stack emissions. 	Complete	Have inserted on-line axial-flow booster fans at the base of applicable stacks. This improvement will increase atmospheric mixing and dispersion.	Sep-12

Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
15	28-Feb-13	<ul style="list-style-type: none"> Route "Smoke Eater" box flue at Furnace 10 into stack above gas-fired Furnace 9 to encourage oxidation of volatiles inside stack during ascent; decommission existing Smoke Eater stack. 	Complete	Smoke Eater Box emissions at Furnace 10 that exited building in 2012 from smallest diameter and shortest stack, between two buildings (encouraging fumigation of northern neighbours) has been decommissioned and stack has been removed....	Feb-13
16	30-Nov-15	<ul style="list-style-type: none"> Ensure emissions capture at source of new (Harrison) sand-core casting machine. 	Cancelled	<p>Low operating temperatures (400°F) at core making stations causes low rate of resin volatilization. Fume hoods at two existing stations capture emissions from each furnace. Decommission old SF-6 machine use the existing hood for the Harrison.</p> <p>**Old SF6 machine will be retained due to capacity requirements. Getting quotes on building and installing fume hood for the Harrison machine.</p> <p>~~Project cancelled. Improved emissions capture will be rolled into and a component of Project #27</p>	
17	31-Dec-16	<ul style="list-style-type: none"> Increase the height of applicable roof-line stacks. 	Active	<p>Goal is to raise stack height by ~5 m. Will increase atmospheric mixing and dispersion.</p> <p>** Moved forward from Phase 2 into Phase 1.</p> <p>**Increased the height of 3 stacks at the shell core process on May 30, 2013 (Fig. 5-2R1).</p> <p>**Furnaces 7 through 10 will not have stacks raised. (See Phase 4 Proj. No. 29)</p> <p>**General ventilation exhaust ports will not be raised. (See Phase 4 Proj. No. 30).</p> <p>**2 stacks, at M4 & M5, Will see their heights increased by Q4 2016.</p>	

Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
18	31-May-19	<ul style="list-style-type: none"> • Replace last four gas-fired furnaces with new electric furnaces, and in so doing, reduce the number of point sources at the roof. 	Active	<p>Will occur as part of the continuing replacement of gas-fired ceramic-crucible furnaces, at a rate of approximately 1 per year. Gas-fired furnaces lose 1.3 M BTU/hr each, cause 11% evaporative loss of molten aluminum, have larger footprint and make more noise.</p> <p>** Furnace #6 decommissioned June 30 2014. Electric replacement furnace is awaiting installation.</p> <p>•Feb 18, 2016; Gas furnace #8 decommissioned. Three gas fired furnaces remain, next replacement scheduled for Q3 2017</p>	
19		<ul style="list-style-type: none"> •Add stack-top venturi (Bernoulli) collars to all raised stacks, to increase emissions exit velocities. 	Complete	<p>Increased exit velocities increases atmospheric mixing and dispersion.</p> <p>**Moved forward from Phase 2 into Phase 1.</p> <p>**Three raised stacks have had stack-top venturis installed.</p>	May-13
20	31-May-15	<ul style="list-style-type: none"> •Install two Filtermist "S" series oil mist filter on Mazak CNC lathes. One located in the pulley cell and one in CNC department. 	Complete	To reduce oil mist emissions from applicable CNC equipment.	Jun-14
21	TBD	<ul style="list-style-type: none"> •Recycle all/most spent sand now being disposed of by BFI. 	On Hold	<p>Seeking opportunities for recycling into asphalt, roadbed materials, landfill daily soil cover, etc.</p> <p>** Seeking/evaluating opportunity with municipal landfill operator.</p>	

Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
22	31-May-17	<ul style="list-style-type: none"> Use localized inert-gas blanket as constraint on air access to the molten aluminum. 	Cancelled	<p>Very expensive, and incremental improvement over current constraints of air access (needed for product quality) would be minimal. Easier and more logical to capture emissions at source than to deny air access to molten metal bath.</p> <p>** Moved forward from Phase 4</p> <p>**May be possible on Schaefer furnace</p> <p>~~Upon further review the project is impractical and is cancelled.</p>	
23		<ul style="list-style-type: none"> Use emissions-dispersion model to benchmark current airshed quality and predict extent of improvement from potential mitigation measures. 	Cancelled	<p>Could be used to quantify extent of benefit from increased stack heights, but such quantification is less important than increasing the heights.</p> <p>** Moved to Phase 4.</p> <p>~~Cancelled</p>	
24		<ul style="list-style-type: none"> Install wet scrubbers to capture waste heat, TSP and soluble aromatics. 	Cancelled	<p>Adds complexity to address extreme thermodynamics of the heat-recovery loop, and is very expensive. Creates additional challenges for storage and disposal of captured solids/sludge. Adds to noise dissemination.</p> <p>** Moved to Phase 4.</p> <p>~~Cancelled</p>	
25		<ul style="list-style-type: none"> Treat all/most emissions (after heat exchange) in BioFilter. 	Cancelled	<p>Successful year-round (low-temperature) system operating at nearby Palliser Furniture, but heat-removal requirements to allow this type of emissions treatment would be complex and expensive.</p> <p>** Moved to Phase 4.</p> <p>~~Cancelled</p>	

Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
26		<ul style="list-style-type: none"> • Install Thermal Oxidizers to oxidize aromatic hydrocarbons in emissions. 	Cancelled	<p>Very expensive, but could fit with plan to install new furnace, fired by adjacent furnace emissions (T=1700°F) to briquet and melt aluminum shavings (now sold to recyclers; Chisick) for recovery in ingot.</p> <p>** Plan to remove gas-fired furnaces eliminates this action as a possibility. Moved to Phase 4.</p> <p>~~Cancelled</p>	
27	30-Dec-18	<ul style="list-style-type: none"> • Reconfigure shop floor to facilitate improved manifolding of all point sources of malodorous emissions. 	Active	<p>Expensive, very disruptive to already stressed production, and less likely to be effective than other measures now committed to.</p> <p>** Moved to Phase 4.</p> <p>~~Upon review this project may have a significant positive effect on our neighbours concerns. Currently determining cost and time line to implement.</p> <p>+Created cellular transition plan (CTP). CTP will allow us to group all of our sand core processes to improve our capture of emissions.</p>	
28		<ul style="list-style-type: none"> • Install dosimeters upstream and downstream of site to supplement indoor air monitoring. 	Cancelled	<p>Certainty of access, vulnerability to vandalism and multiple other sources makes this problematic.</p> <p>** Moved to Phase 4.</p> <p>~~Cancelled</p>	
29		<ul style="list-style-type: none"> • Improve sealing of entire building. 	Cancelled	<p>Expensive, and less likely to be effective than other measures now committed to, and largely irrelevant as the essential exothermy of the plant means it is under negative pressure most of the year.</p> <p>~~Cancelled</p>	
30		<ul style="list-style-type: none"> • Raise stacks at furnaces 7 through 10 	Cancelled	<p>Expensive and conflicts with the plan to eliminate all gas-fired furnaces.</p> <p>**Moved to Phase 4.</p> <p>~~Cancelled</p>	

Project No.	Esitimated Completion Date	Project Description	Current Status	Comment	Completion Date
31		<ul style="list-style-type: none"> • Raise general ventilation ports ~5 m 	Cancelled	Very expensive. Easier and more logical to capture emissions at the source. **Moved to Phase 4. ~~Cancelled	
32	11-Feb-16	<ul style="list-style-type: none"> •Improve particulate capture by using improved filter media. 	Complete	New Project (25 Aug 2015) Previous filter material is PS100D with a Arrestance of 75-80% Proposed filter media is PROTEK BLUE with a Arrestance is 80%-85% <ul style="list-style-type: none"> •21 Sep 2015; Conservation MB was notified of testing improved filter media. •17 Nov 2015; Testing complete. •11 Feb 2016; NoA sent to MB Conservation. 	11-Feb-16
33	31-Aug-16	<ul style="list-style-type: none"> •Evaluate reduced emissions sand core sand. 	Complete	New Project (5 May 2016) Aquire HA International's Custom Coat E-Series sand, conduct operational testing. <ul style="list-style-type: none"> •5 May 2016; CWS was notified of our intent to conduct operational testing of this new sand. •29 Jun 2016; Testing concluded, operational testing sucessful. Decision made to switch to E-Series sand. •6 Jul 2016; CWS notified of successful testing and of our decision to proceed with the new E-Series sand. 	8-Aug-16

MORGAN MKV ELECTRIC RESISTANCE BALE OUT FURNACE

FURNACE DESCRIPTION

The MK V Electric Resistance Bale Out Furnace suitable for metal temperatures up to 850°C, has been designed to have a high level of thermal efficiency, hence keeping energy costs low.

Radiation losses from the metal are minimised through the use of a well insulated, swing aside cover that can cover the crucible when no baling is needed.

The superb insulation provides excellent melting performance from the semi-embedded heater panels.

The advanced insulation materials used in the furnace lining also result in low casing temperatures, providing comfortable working conditions.

HEATER ASSEMBLIES

Twelve high alumina electric resistance heater panels surround the crucible and generally extend to the full depth of the furnace chamber.

The self-supporting and interlocking design provides easy removal, should a panel require changing.



- Energy Efficient
- Good Crucible Life
- Silent Operation
- Environmentally Friendly



MKV ERBO 80 01/12. MMP reserve the right to change specs. at any time and are not responsible for typographical errors

HIGH EFFICIENCY

The combination of semi-embedded heater panels optimising radiant heat transfer and the use of advanced insulating materials, provide a melting and holding furnace of high efficiency with comfortable working conditions.

SIZE RANGE

The MK V Electric Resistance Bale Out is available in the size range 85kg - 1327kg aluminium. Other crucible patterns than those shown in the table are available to provide the capacity span indicated for each size reference.

Also Available:
Zinc applications. H.T. versions up to size 3, for brass, to 1000°C.

ELECTRIC SUPPLY

400/415/480v
3 Phase 50/60hz.

MORGAN MKV ELECTRIC RESISTANCE BALE OUT FURNACE

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KEY FEATURES

HEATER PANELS

The furnace has twelve, semi-embedded, FeCrAl wire heaters surrounding the crucible. Designed with low surface watt loadings and freely radiating coils the heaters give excellent life. Should a panel fail, it can easily be changed and, if absolutely necessary, in a hot condition without metal removal.

CONTROL PANEL

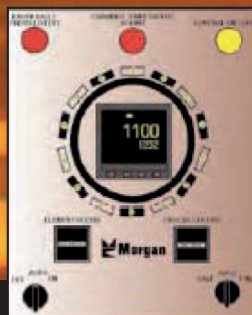
A modern high quality control panel provides the following features:

- Protective circuit breaker, door interlocked
- Heavy duty contactors or Thyristor power control*
- Programmable time clock.
- Fully proportional digital temperature controller
- Policeman lining protection pyrometry
- Crucible and heater operational hour meters
- Heater operation LED mimic display
- Temperature depression selection switch

* Optional at extra cost

OPTIONAL FEATURES AVAILABLE

- 'In range' temperature beacons
- Low temperature alarm
- Spilt metal detector
- Pneumatic crucible cover
- Kwh. meter
- Thyristor power control
- Communications
- Metal temperature overshoot control

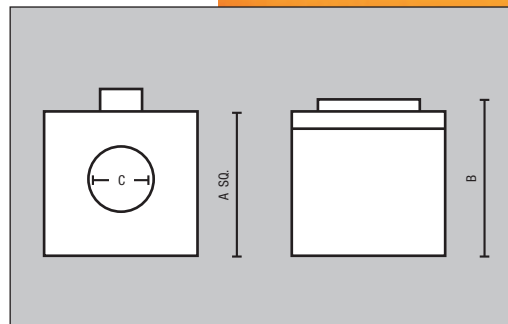


Control and Mimic Display

Data based on optimum foundry conditions and practices.

For typical foundry operations a performance factor of 90% of performance ratings should be assumed.

Data for zinc alloys available on request.



ADVANCED DESIGN

The MK V Electric Resistance Bale Out furnace is compact, of robust design and with the exception of the control panel, has no separate stand alone components. High reliability is obtained by the use of high quality components and well proven semi-embedded heater panel technology.

TEMPERATURE DEPRESSION

This energy saving and safety feature enables a lower holding temperature to be automatically selected during periods of non-use.

The control panel's real time clock can be programmed to select reduced temperature and to return to operational value when required.

The time clock can also be set to switch the furnace on and off at pre-set dates and times.

METAL TEMPERATURE CONTROL

The temperature can be sensed from a floating, fixed or crucible pyrometer. The dual display programmable digital controller maintains close control, by regulating the power input to the heaters, relative to actual metal temperature and set value.

MkV HE ELECTRIC RESISTANCE BALE OUT		ALUMINIUM TO 720c													
MkV Furnace Size Reference		Size 1		Size 2		Size 3		Size 4		Size 5		Size 6			
Working Capacity		119	165	233	271	327	444	575	575	815	1024	762	1327	1290	1327
Max Power Rating	kW	46	46	46	46	54	72	72	96	120	120	120	120	150	150
Power Consumption	Covered	2.8	2.8	4	4	4.5	6.6	7	7	10.2	11	14	15	15	16
kWh/hr Holding	Uncovered	7.5	7.5	9.5	9.5	10	14.5	15	15	20	22	34	35	38	40
Melt Time (Mins)	1st Heat	144	173	216	260	252	300	380	280	330	395	310	420	400	430
	Subsequent Heats	94	113	151	181	185	215	278	208	216	258	202	275	265	290
Power Requirement KVA		50	50	50	50	60	80	80	105	130	130	130	130	170	170

Typical specific energy consumption: subsequent heat, 0.55kWh/kg* Throughput melting, 0.41kWh/kg* *Variances subject to crucible pattern. Brass melting and other furnace sizes available.

	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
Capacity by Crucible	Capacity Range Kg Al. 85 - 172 Pattern	Capacity Range Kg Al. 163 - 327 Pattern	Capacity Range Kg Al. 310 - 575 Pattern	Capacity Range Kg Al. 595 - 1135 Pattern	Capacity Range Kg Al. 762 - 1327 Pattern	Capacity Range Kg Al. 950 - 1327 Pattern
	BX166/BU100	BX202/BU210	BX1264	BX850/BN600	52100	60815
	BX167/BU125	BX302/BU250	BX847/BN500	BX851/BN800# 810	52330	60990
	BX168/BU150	BX401/BU300	BX247/BU500	BX852/BN1100* 930	52370	61050
	BX169/BU175	BX402/BU350	BX263/BU600	BX853	52770	1300
	BX171/BU200					
BX177/BU202						
Furnace Dimensions (mm)	A 1190 B 900 C 433	A 1190 B 900 - 980* C 510	A 1420 B 1130 - 1270* C 660	A 1526 B 1330# - 1520* C 735	A 1651 B 1125 - 1395 C 864	A 1740 B 1280 - 1490 C 940
Shipping (approx) Net Weight	Kg 900	Kg 900	Kg 1300	Kg 2500	Kg 3000	Kg 3500
Gross Weight	Kg 1100	Kg 1100	Kg 1500	Kg 2750	Kg 3300	Kg 3800
Volume	M3 3.7	M3 3.7	M3 5.35	M3 10	M3 7	M3 8

* Increased furnace height