



INDUCTION FURNACE RANGE

Overview

As you will know, this type of equipment has been extensively manufactured by ourselves for the precious metals industry since our inception in 1959. We have steadily grown over the years into the enviable position of being market leaders in this field in Southern Africa, as well as some other parts of the world. More specifically, this equipment proposed is identical to the very many units we manufactured and supplied to gold mines around the world...

“KEEGOR”™ is a registered trade/brand name to the Keegor Group of companies and has become synonymous with the quality and reliability expected by the precious metals mining industry. For the design, manufacture, shop testing, ex-works delivery and optional on-site checkout of installation and commissioning of the following equipment:

Recent Induction Furnace Projects

- AngloGold for Western Deep Levels (RSA)
- Goldfields for Beatrix Mine (upgraded unit) (RSA)
- Chemwes project (RSA)
- Great Basin Gold for Burnstone (RSA)
- Randgold Resources for Morila (Mali), Loulo (Mali), Tongon (Cote d'Ivoire), and Kibali (DRC)
- Iamgold for Essakane (Burkina Faso)
- Agnico-Eagle Mines (Canada)
- Varvarinskoye (Kazakhstan)
- Nevsun for Bisha (Eritrea)
- Time Mining for Gadag (India)
- Proserve for Pustinoye (Kazakhstan)
- G-Mining for Merian Gold Mines (Suriname)



INDUCTION FURNACE RANGE

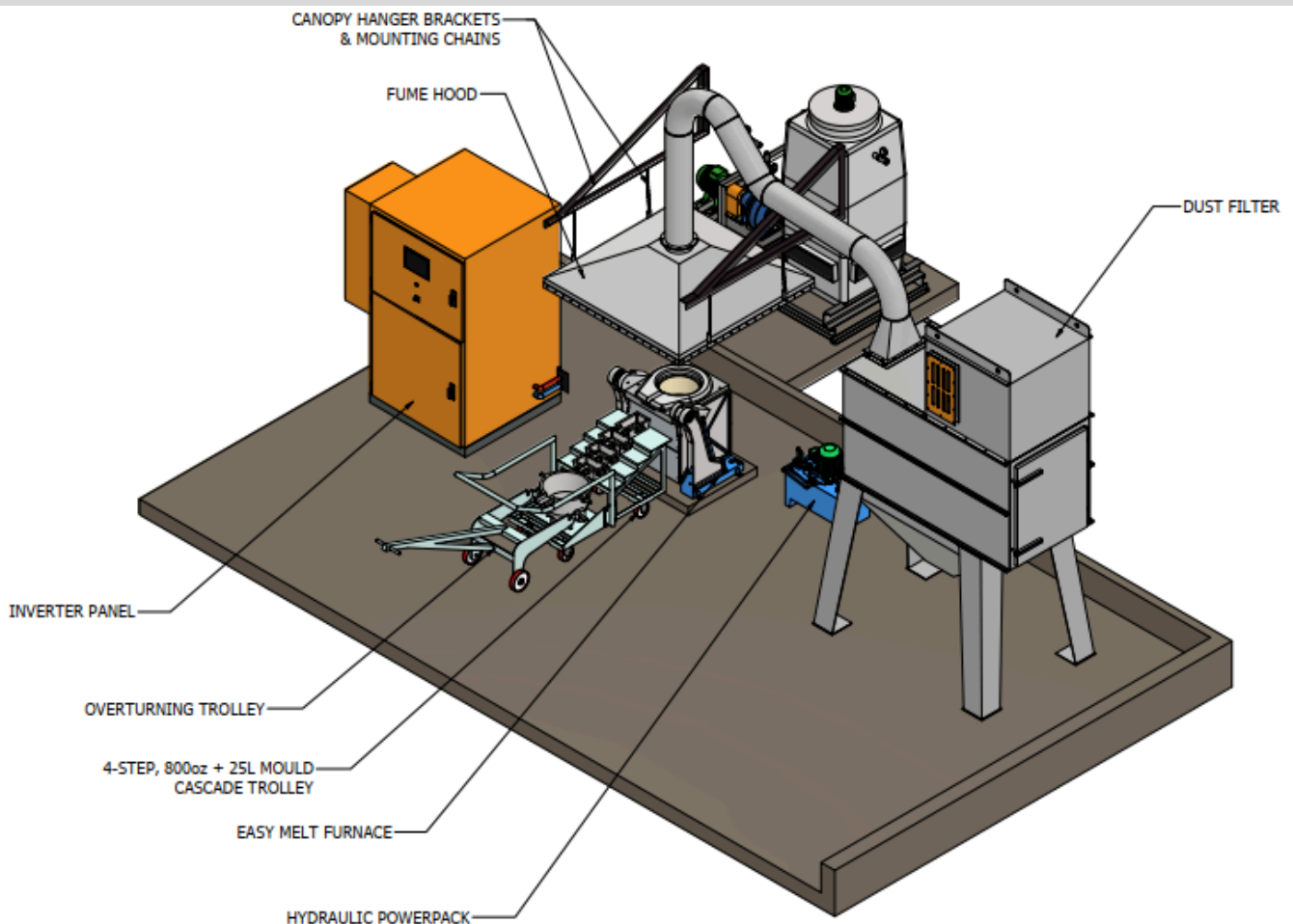
Induction Furnace Overview

NOTE:

All induction furnace packages listed below including the 100KW, 125KW, 150KW and 250KW has been broken down into sub-items and detailed separately, namely:

- Furnace
- Inverter Panel (with internal closed loop cooling circuit)
- Hydraulic Power Pack (with additional hand pump)
- Evaporative type Cooling Tower, together with fan, pump, switches and interlocks
- Cascade trolley with bar moulds, slag mould and slag mould handling trolley

General Layout of our Induction Furnace Range





100KW 'easy melt' INDUCTION FURNACE

Crucible Options:

100kW INDUCTION FURNACE:

The Induction Furnace is capable of accommodating one of the following tapered crucible options:

- AX100 Crucible with a brimful capacity of 16 liters,
- AX120 Crucible (18 liters)
- AX150 Crucible (22 liters).
- AX80 Crucible (14 liters),

Alternatively, a furnace with a parallel coil, sized for a

- TEX330R (33 liters)

Inverter Panel:

Prime consideration is given to high reliability. The equipment is designed for easy access to all major components for maintenance or repair.

- Isolation transformer, giving the correct voltage to the inverter, while galvanically isolating the furnace from the main supply for increased safety.
- 100 kW continuously rated converter power supply with BST-1 diagnostic control. The power is infinitely variable from 0 to full power, with very good power factor across the full range (better than 0,95). Independent power limit is available with digital display of true power to 3 decimal places allowing for very accurate control. Constant accurate power output is ensured, irrespective of incoming voltage fluctuations, this is made possible by an independent adjustable power limit, located conveniently inside the cabinet to avoid unauthorised adjustment. The inverter circuit is protected to avoid damage to costly electrical components.
- All semiconductors are standardized and are over-rated for the application giving a high margin of safety. Simple component layout gives access to semiconductors including the clamping.
- Essential parameters such as frequency, voltage and current are displayed on the panel. Should unsafe conditions arise, the heater will operate under restricted conditions or will automatically trip.
- The inverter water-cooling is a built-in closed loop circuit. This is complete with stainless steel pump, heat exchanger and tank, ensuring no contaminated or chemically unsound water is passed through the internal water circuits, this water passes through an in line water conditioning cartridge which keeps the water conductivity low. This cooling circuit interfaces with the cooling tower and pump quoted separately.



100KW 'easy melt' INDUCTION FURNACE

Furnace Tilting Hydraulic Power Pack:

For the design, manufacture, shop testing and delivery of a Hydraulic Power Pack, complete, for the above furnace. As standard, a hand operated pump would additionally be fitted, to allow for manual tilting in the event of a power failure.

Furnace Cooling System:

For the design, manufacture, shop testing and delivery of an Evaporative type Cooling Tower, complete with fan, pump, all switches, interlocks (pressure, flow and temperature), etc.

Cascade Trolley With Moulds:

For the design, manufacture, shop testing and delivery of a stepped cascade trolley to suit 5 cascade bullion moulds and 1 Slag Mould.

The trolley would be mounted on large diameter castors for ease of maneuverability. This will include the following:

- 1 x Bullion Mould Trolley on castors.
- Set of 5 x cascade type standard Bullion Moulds.
- 1 x No 6 Slag mould (25 liter capacity)
- 1 x Slag mould handling trolley which will allow a full (hot) slag mould to be removed from the trolley and placed remotely for cooling. The handling trolley also has the facility to invert the slag mould once the slag has solidified, for easy emptying.

Furnace Cooling System:

For the design, manufacture, shop testing and delivery of an Evaporative type Cooling Tower, complete with fan, pump, all switches, interlocks (pressure, flow and temperature), etc.



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Furnace Bag Filter System

To operate the Induction Furnace, it is essential to install a comprehensive dust extraction system to draw away and filter fumes and capture dust particles (which can, and often do contain precious metal fines requiring reprocessing). Without the correctly rated system in place it is all but impossible to operate the equipment properly because the dust and fumes make it all but impossible for the operators to see what they are doing, but it is obviously also important to also consider the associated occupational health implications and environmental controls as well. Thus, this Dust Control Equipment is an essential part of the installation, which cannot be omitted. The proposed unit is of the automatic reverse-jet self-cleaning type, with "POLYESTER" filter bags. A hood over the furnace, with silica-glass curtains would be supplied together with mounting brackets for support off the roof or an adjacent building wall. All interconnecting ducting between hood to filter and filter to exhaust would be supplied, provided the filter is positioned in close proximity of the furnace with ducting runs as short and direct as possible. For the design, manufacture, shop testing and ex-works delivery of a Bag Filter system complete for the furnace. This will include the following:

- Bag Filter
- Set of inlet and outlet ducting, with the arrangement of the equipment such that it stands in close proximity to the furnace and adjacent building wall, for exhaust (i.e. no long duct runs have been allowed for, but can be accommodated, if required - within reason).
- Local control panel to control all aspects of the dust extraction system (fan motor controls as well as control circuitry for the reverse-jet pulsing system). This local panel would be mounted on the side of the filter and cabled up to the various connection points on the filter, requiring only an incoming supply to be connected.
- Canopy, canopy support and silicon glass curtains.



INDUCTION FURNACE

IMPORTANT INFORMATION

WARRANTY

- **WARRANTY:**
- We, KEEGOR warrant the satisfactory operation and durability of the mechanical parts supplied by us for a period of 12 (TWELVE) months from date of commissioning or 15 (FIFTEEN) months from date of shipping (whichever expires first) and will replace free of charge any parts which may prove defective either through faulty design, materials, or workmanship. Fair wear and tear or accidents due to faulty operation excepted.
- It is understood that this warranty does not apply to the refractory materials or consumable items.
- Notice of a claim for alleged defective equipment must be given within 14 (FOURTEEN) days of a defect becoming evident.
- This warranty is limited to the supply of replacement parts and labour only, as may be required - shipping / transport / travel costs are not included.
- Full support is available at our ruling rates after expiry of the warranty - KEEGOR GROUP (in the form of Leonard Light industries) has been a key global role player in the Precious Metals Refining and Assaying Industry for +60 years, with a very long and distinguished track record.
- Neither KEEGOR GROUP / LEONARD LIGHT INDUSTRIES are liable for any consequential damages.
- Electronic and electrical components sourced from sub suppliers are excluded or subject to supplier warranty conditions.
- Power electronic components and items which are subject to usage and operational conditions, are excluded.
- The connecting, usage and maintenance of induction coils, is excluded. In particular failures due to incorrect clamping or water cooling of coils to bus bars.
- The responsibility for maintaining the quality of the cooling water is outside of our control and therefore we assume no responsibility for problems arising due to the end user failing to meet our specifications. For queries relating to the water-cooling requirements, please contact our service department.
- The warranty is not valid unless the make-up water supply to the cooling tower is installed and functioning. All cooling systems, internal and external are to be maintained to comply with the specifications defined in the instruction manual.



INDUCTION FURNACE

IMPORTANT INFORMATION

VERY IMPORTANT INFORMATION

- **VERY IMPORTANT NOTE:**
- The equipment offered (particularly with reference to the Induction Furnace package), is mining specification equipment, complying fully with the normal specifications put out for mining applications - E.G. serviceable pumps with coupled premium efficiency motors (in place of integral motorized pumps that cannot be repaired), recognized switchgear makes (Schneider, Cuttler Hammer, or similar, etc. instead of no-name brand equivalent components), touch screen interface with on-board trending, full indication of status, trips, faults, preset ramp functions, etc. and other added functionality (in place of basic potentiometer adjustment of power with LED indication of status/trips, etc.), full power isolation in a side mounted incomer panel so that the Inverter Panel is fully isolated and safe before opening doors, much more robust construction, etc.