HLQ

INDUCTION HEATING EQUIPMENT

Induction Melting Gold — from 1 kg Benchtop to Industrial Furnaces

IGBT induction gold melting furnaces for jewellery casting, refining, assay and recycling. Fast, clean melting with precise temperature control and electromagnetic stirring.

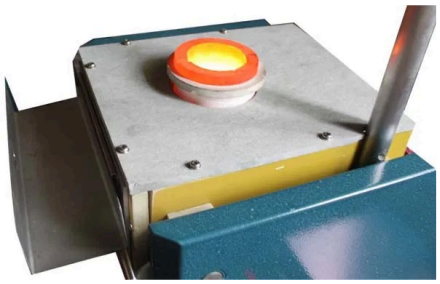


1,064 °C	0.5–200 kg+	3–300 kW	3–45 min
gold melting point	per batch	benchtop to industrial	full-load melt time

01 What is induction gold melting?

An alternating current in a copper coil creates a changing magnetic field. Eddy currents induced in the gold charge — and in a graphite crucible — are turned into heat by electrical resistance, melting the gold from the inside out. Compared with gas, coal or oil-fired crucible furnaces, induction gives faster heating, precise temperature control, cleaner operation and lower contamination risk.

Tier	Capacity (pure Au)	Power	Frequency	Melt time	Cooling
Benchtop	0.5–5 kg	3–15 kW	20–80 kHz	3–10 min	Air or small water chiller
Medium	5–30 kg	15–60 kW	3–30 kHz	8–20 min	Closed-loop water chiller
Industrial	30–200 kg+	60–300 kW+	1–10 kHz	20–45 min	Industrial chiller / tower



Benchtop gold melting furnace.



Gold charge melting in a crucible.



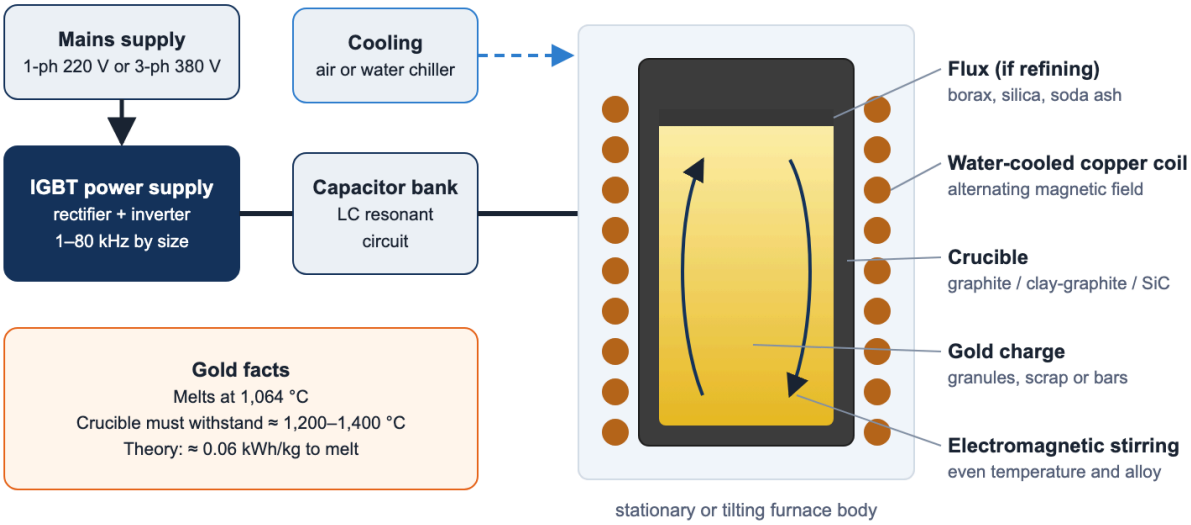
Tilting gold melting machine.

02 How it works

Induction Melting Gold: How It Works

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The coil induces eddy currents in the gold charge and the graphite crucible; heat melts the gold from the inside.



Current penetration depth in solid gold at 20 °C (physics, ρ ≈ 0.024 µΩ·m)

80 kHz	20 kHz	10 kHz	3 kHz
benchtop	benchtop	medium	medium / large
δ ≈ 0.28 mm	δ ≈ 0.56 mm	δ ≈ 0.79 mm	δ ≈ 1.43 mm

Key components

Component	Function
Power supply	Rectifier + inverter + control; sets output kW and kHz
Induction coil	Water-cooled copper tubing; helical or pancake shape
Crucible	Graphite, clay-graphite, SiC, alumina or zirconia; withstands ≈ 1,200–1,400 °C
Cooling	Closed-loop chiller or tower (air-cooled on small benchtop units)
Control	Digital power control, pyrometer or thermocouple, safety interlocks

03 Capacity tiers and HLQ models

Gold Melting Furnaces – HLQ Capacity Tiers and Models

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Typical ranges from the HLQ induction gold smelter page, and published HLQ gold furnace models.

Benchtop
0.5–5 kg · 3–15 kW
Frequency 20–80 kHz
Melt time 3–10 min
full load, pure Au

Medium
5–30 kg · 15–60 kW
Frequency 3–30 kHz
Melt time 8–20 min
full load, pure Au

Industrial
30–200 kg+ · 60–300 kW+
Frequency 1–10 kHz
Melt time 20–45 min
full load, pure Au

Theoretical heat
Gold to ≈ 1,100 °C:
≈ 0.06 kWh/kg (physics)
1 kg ≈ 0.06 kWh
5 kg ≈ 0.3 kWh
30 kg ≈ 1.8 kWh

Published HLQ gold furnace models

M.MF.ML001
small water-cooled melter
220 V single phase, ≈ 3 kW output
1–2 kg gold; max 1,450 °C
3–5 min; 580×300×330 mm, 28 kg

DW-SGM
stationary gold furnace
2, 3, 4, 5, 6, 8 kg capacity
IGBT; digital temperature display
100% load, 24 h operation

DW-TGM
tilting gold furnace
2, 3, 4, 5, 6, 8 kg capacity
600×510×1080 mm, 110 kg
tilting handle pours into mould

Ranges are typical reference values; actual performance depends on charge, crucible, coil and cooling. Model data as published on HLQ product pages.

Applications

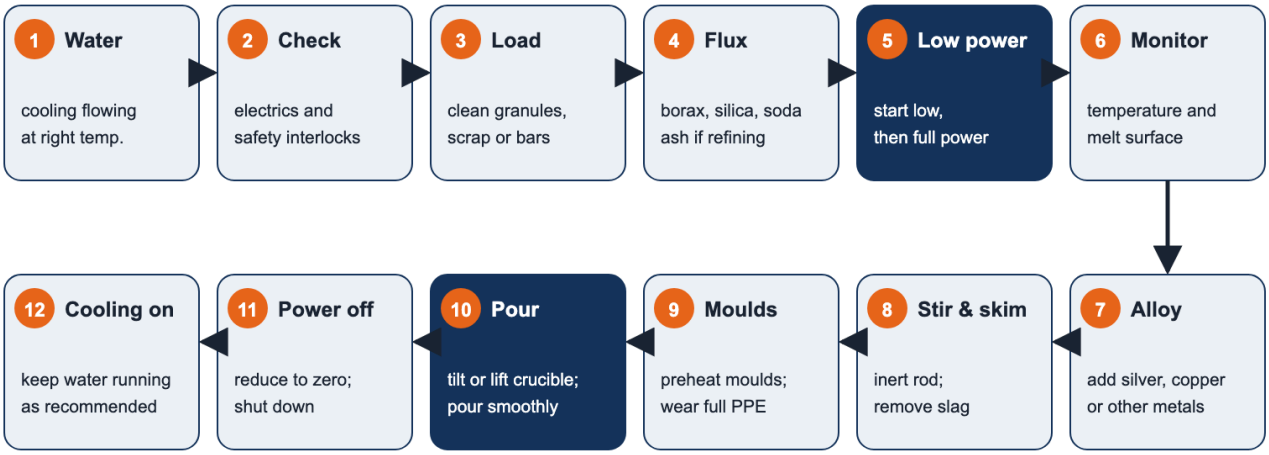
Application	Typical tier
Jewellery casting and alloy production	Benchtop / medium
Small–medium scale gold refining	Medium
Fire assay and laboratory work	Benchtop
Recycling of electronic and dental scrap containing gold	Medium / industrial
Refineries, large casting houses	Industrial

04 Process workflow and workshop layout

Induction Gold Melting – Process Workflow

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Standard operating steps from the HLQ induction gold smelter page.



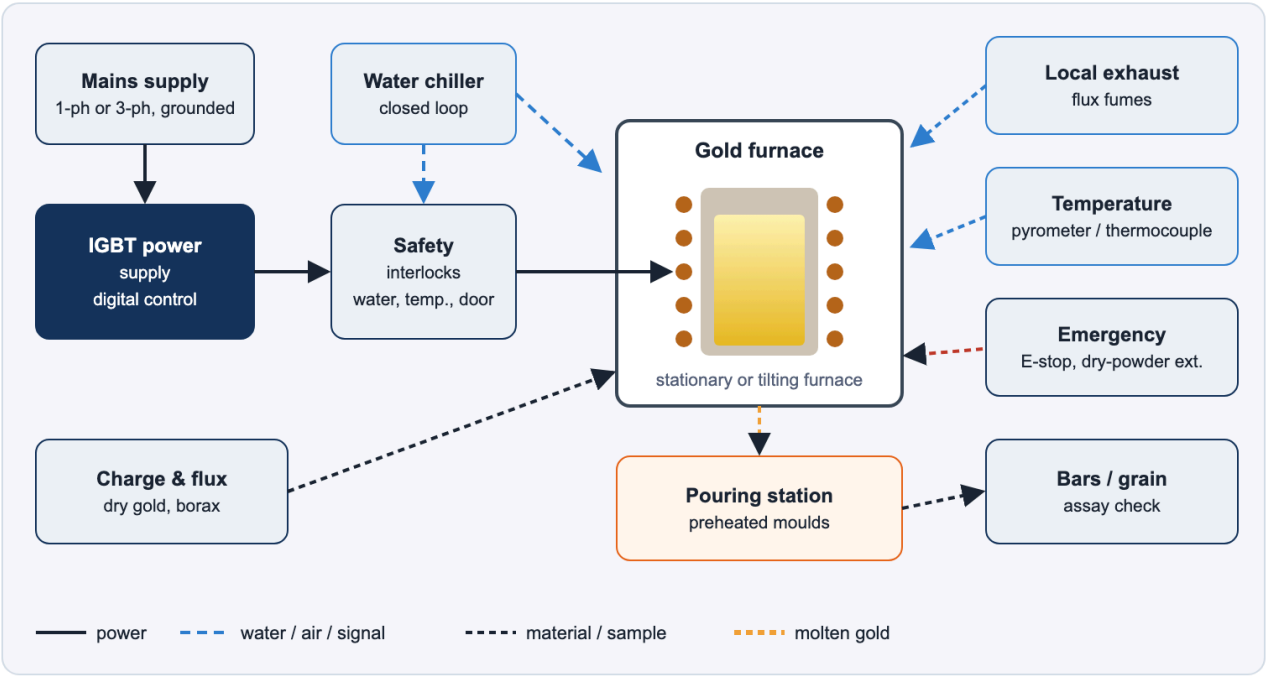
Control points

- Never introduce wet tools, moulds or scrap into the melt; control charging to avoid eruptions and splashing.
- Provide local exhaust where fluxes or other metals may fume.
- Keep an accessible emergency stop, dry-powder extinguishers and clear evacuation routes.

Gold Melting Workshop – Typical Layout

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Schematic, not to scale. Shows the equipment and safety items named on HLQ gold furnace pages.



05 How to choose and what to watch

Factor	What to confirm
Melting capacity	kg per batch and batches per day
Power and melt time	Higher kW = faster melt but more investment and power demand
Power supply	Single-phase or three-phase; electrical protection
Cooling	Space for chiller or tower; ambient temperature; water quality
Purity	Crucible choice to limit carbon or impurity pick-up; lid to reduce oxidation
Operation	Automatic or manual; interlocks, alarms, emergency stop

Advantages and limitations

Advantages	Limitations
Fast melt times and high efficiency	Higher initial investment than gas furnaces
Accurate, repeatable temperature control	Needs reliable electricity and cooling water
No open flame or combustion gases	Coil and crucible must be matched and inspected
Reduced metal loss and oxidation	Less practical where power is unstable
Lower contamination risk	Crucible temperature limits apply

06 Frequently asked questions

How long does it take to melt gold?

Typically 3–20 minutes for small and medium units and up to 45 minutes for large industrial units at full load.

What temperature does gold melt at?

1,064 °C. Crucibles must withstand about 1,200–1,400 °C.

Which frequency?

20–80 kHz for benchtop units, 3–30 kHz for medium, 1–10 kHz for industrial furnaces.

Which crucible?

Graphite or clay-graphite for most work; SiC, alumina or zirconia are also used.

Can it melt other metals?

Yes — silver, copper, brass, bronze and other non-ferrous alloys within the temperature and crucible limits.

What power supply do I need?

Benchtop units can run on single phase; medium and industrial units need three-phase industrial power.

Why choose HLQ

1 kg to industrial
M.MF.ML001, DW-SGM, DW-TGM and larger systems.

IGBT power
Stable output; 100% load, 24 h operation on DW-SGM.

Protections
Over-voltage, over-current, water, over-heating, phase fault.

Stationary or tilting
Tilting handle pours straight into the mould.

Crucible guidance
Graphite, clay-graphite, SiC, alumina, zirconia.

Precious metals
Gold, silver, copper and alloys.

Request a gold furnace proposal

Tell us the batch weight, batches per day and power supply. We will recommend the furnace, crucible and cooling.

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Please include in your inquiry

- Metal (gold, silver, alloy) and kg per batch
- Batches per day and target melt time
- Single-phase or three-phase supply
- Stationary or tilting; pouring method
- Cooling water availability