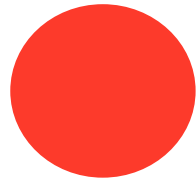


“Necessity of Induction Furnace for Investment Casting & Precious Metal Melting Application”

IIM Delhi Chapter, New Delhi

20th December 2014





INDUCTOTHERM

(INDIA) PVT.LTD

An Inductotherm Group Company



INDUCTOTHERM
GROUP | INDIA

INDUCTOTHERM GROUP

**AN INTERNATIONAL GROUP OF 60
COMPANIES**

OPERATING IN 17 COUNTRIES

**EMPLOYING OVER 3,200 PEOPLE
WORLDWIDE**

**ANNUAL SALES IN EXCESS OF
US\$1,000,000,000.00**

ESTABLISHED IN 1953



INDUCTOTHERM GROUP

INDUCTOTHERM CORP. • INDUCTOHEAT
CONSARC • INDUCTOTHERM HWT
BRICMONT INDIA • HWG INDUCTOHEAT
INDUCTOTHERM INDIA • THERMATOOL
ABPLAN • INDUCTOTHERM GERMANY
INDUCTOTHERM KOREA • ONDARLAN
SERVMELT • INDUCTOTHERM BRAZIL
INDUCTOTHERM RUSSIA • BRICMONT
ALPHA 1 • INDUCTOTHERM MEXICO
INDUCTOTHERM TAIWAN • NEWELCO
SAVAGE SAWS • INDUCTOTHERM TURKEY
INDUCTOTHERM FRANCE • BANYARD
HI T.E.Q. • INDUCTOTHERM BELGIUM
INDUCTOTHERM EUROPE • RADYNE
T&H LEMONT • INDUCTOTHERM JAPAN
INDUCTOTHERM AUSTRALIA • EMSCO
LEPEL • INDUCTOTHERM GROUP CHINA
INDUCTOTHERM GROUP CANADA • PV/T



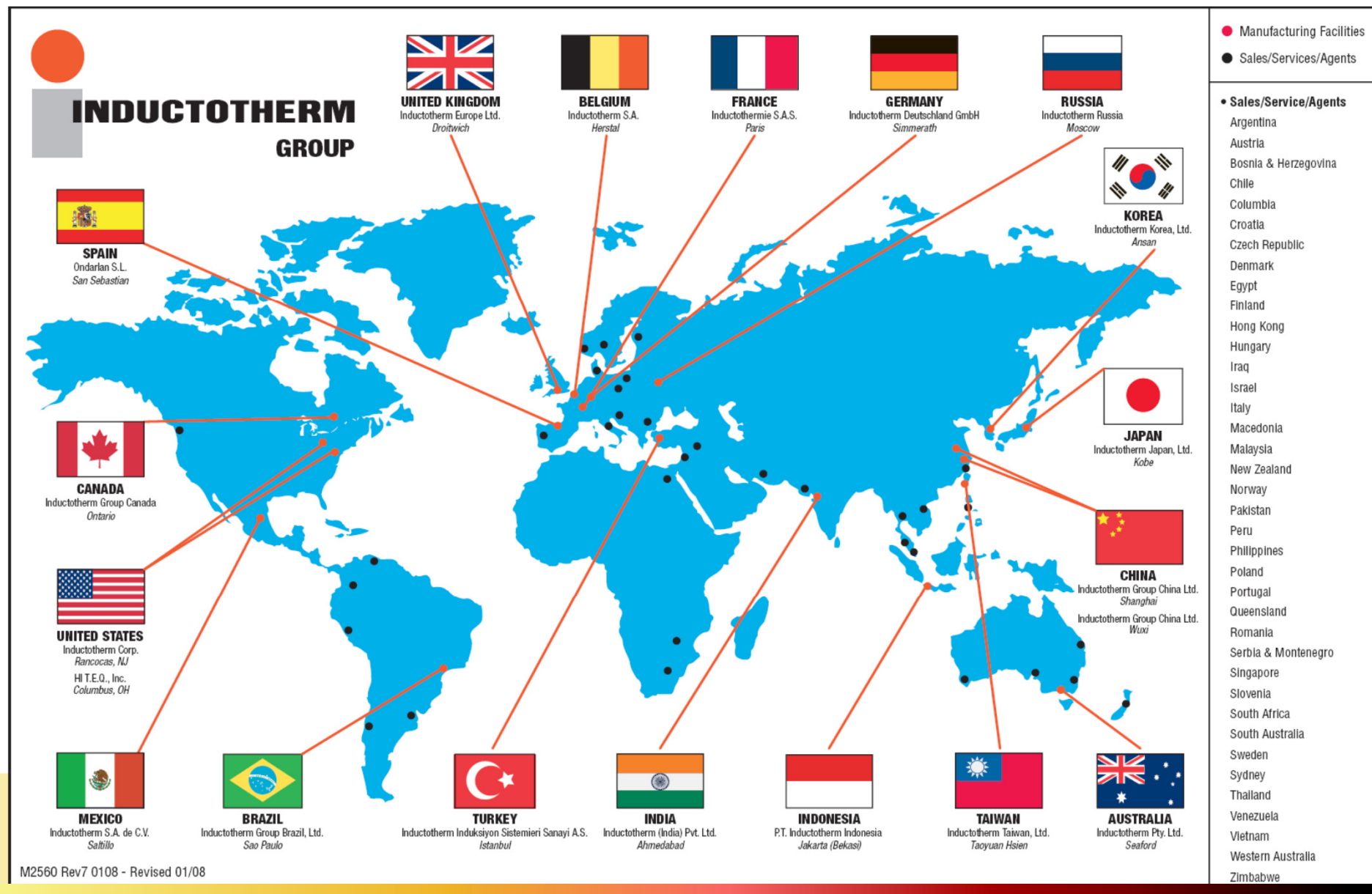
**“...IF A CUSTOMER
CALLS ME RIGHT NOW
I’LL EXCUSE MYSELF
FROM THIS MEETING,
ANY MEETING, AND TALK
TO HIM...”**

HENRY M. ROWAN
Chairman / President Indel Inc.

Global Network



INDUCTOTHERM





Head Quarters at Rancocas, New Jersey, USA

INDUCTOTHERM GROUP

MAIN BUSINESS ACTIVITIES

INDUCTION MELTING - HOLDING & AUTOMATIC POURING

INDUCTION HEATING

INDUCTION TUBE WELDING

**VACUUM INDUCTION, VACUUM ARC, ESR & PRECISION CASTING
SYSTEMS**

VACUUM HEAT TREATMENT

**MASS INDUCTION HEATING FOR ROLLING, CONTINUOUS
GALVANIZING BATHS & GALVANNEAL FURNACES**



**INDUCTOTHERM
GROUP | INDIA**

What We Do



INDUCTOTHERM (INDIA) PVT. LTD.

ESTABLISHED IN 1983

435 + EMPLOYEES

TURNOVER IN EXCESS OF 80 M US\$






LARGEST FURNACE EVER BUILT 55 TONNES

LARGEST POWER SUPPLY EVER BUILT 22,000 kW

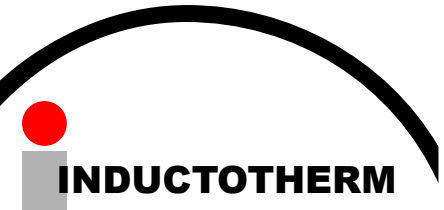
OVER 5200 INDUCTION (MELTING/HEATING/WELDING) SYSTEMS SUPPLIED



TYPICAL MELTING OPERATION CYCLE

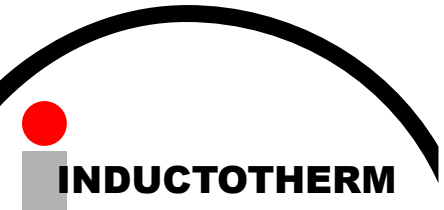
- **INITIAL CHARGING ON A EMPTY FURNACE** 
- **MELTING OPERATION** 
- **DESLAGGING OPERATION** 
- **SAMPLING / CHEMISTRY ADJUSTMENT** 
- **EMPTYING OUT / POURING OPERATION** 

RECOMMENDED MELTING PRACTICE FOR EFFECTIVE ENERGY UTILIZATION



1. Furnace lining Must be Hot (Round the clock Operation is advisable). The melt must start with known charge weight and calibrated submersible temperature measurement unit.
2. A continuous supply of electrical energy to the power supply and all auxiliaries is required. The supply line voltage to be in the range -5% to +10% at all times.
3. These charge materials should be dry, free of rust, foundry sand and combustible materials with a minimum of 98% metallic content. For every percentage increase in non-metallic inclusions, the melt rate will decrease by approximately 2% and the consumption of power will increase by adding approximately 10 Kwh / M.Ton.

RECOMMENDED MELTING PRACTICE FOR EFFECTIVE ENERGY UTILIZATION



4. Charge material dimension should not exceed 50% of the furnace melt diameter. The melt should commence no longer than 5 minutes after the previous melt and full power must be drawn.
5. Melt starting with an empty furnace, the weight of the charge material in the furnace must be not less than 30 to 50% of the rated capacity of the furnace.
6. The melting indicators must be closely monitored for maximum power delivery to the furnace.

POWER SUPPLY DESIGN

POWER-TRAK

Dual-Trak

Multi-Trak

Power Supplies with single or dual frequency outputs for single or multiple furnace applications

Batch or Heel Melting

Holding/Duplexing

POWER SUPPLY RATINGS

From 5 to 25,000 kW

From 60 to 10,000 Hz





Types of Investment Castings

Some special equipment combinations for investment castings

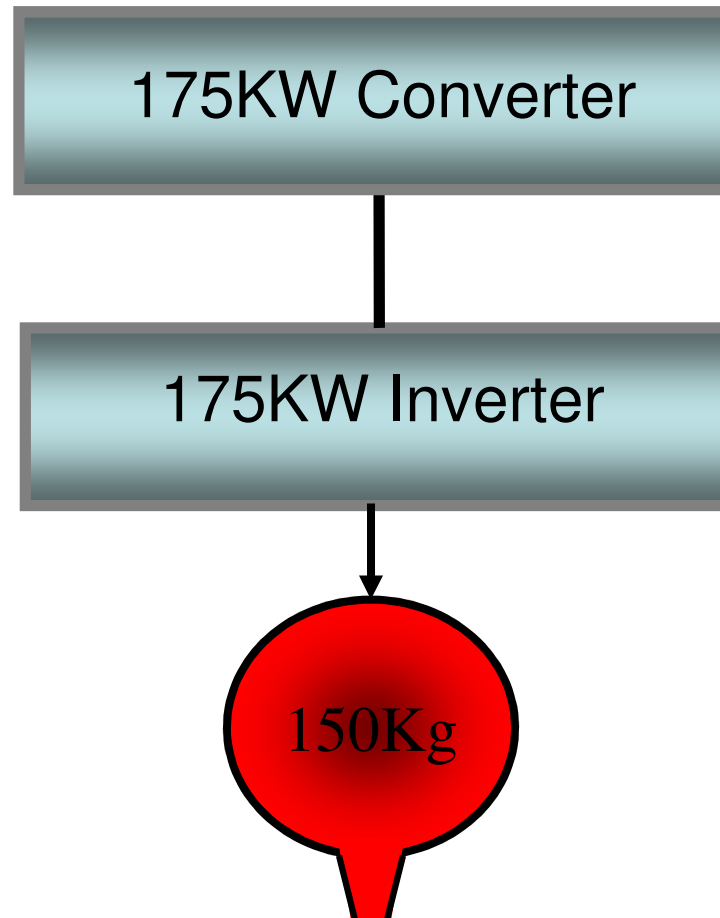
175kW Mono-Trak /150Kg

175kW Dual-Trak/ 150Kg

250kW Tri-Trak / 300Kg

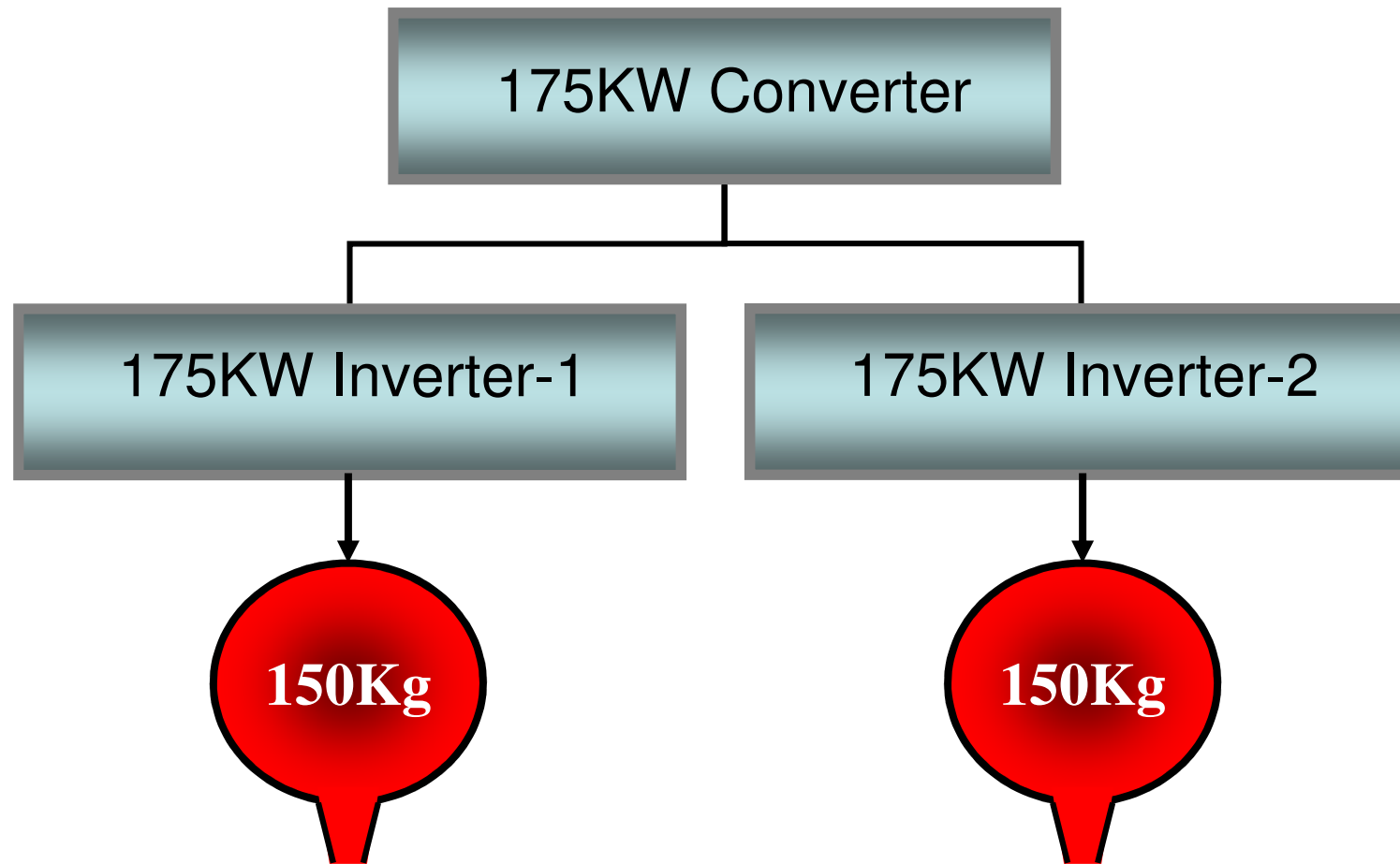


175 KW MONO TRAK



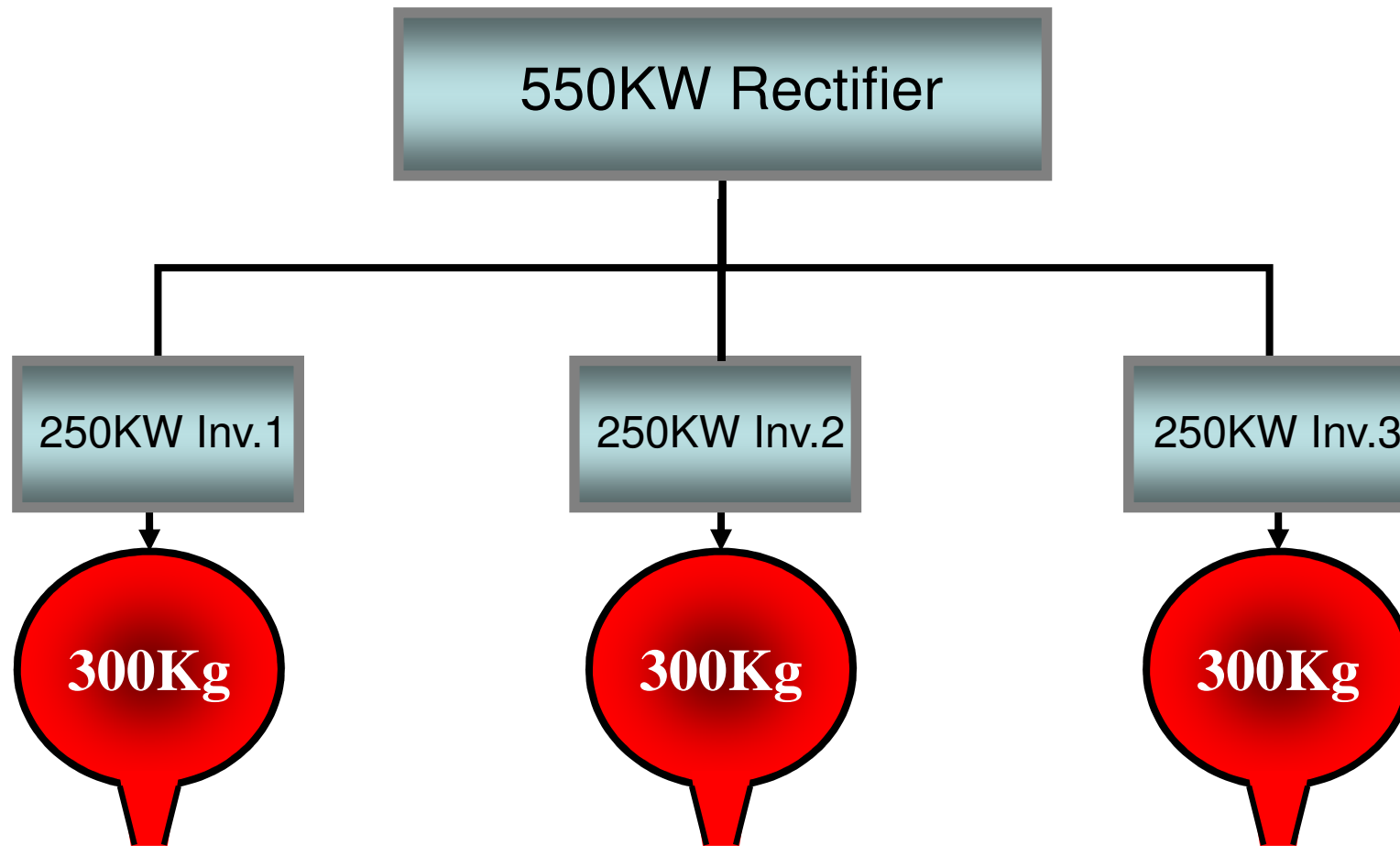
PRODUCTION ACHIEVABLE : 4 - 4.5 TONS / DAY

175 KW DUAL TRAK



PRODUCTION ACHIEVABLE : 5.3 - 5.5 TONS / DAY

250 KW TRI TRAK



PRODUCTION ACHIEVABLE 18 - 20TON / DAY

Installation Photographs

Furnace Size – 15Kw/5Kgs

**Application – Ring Manufacturing Through Investment
Casting Process**



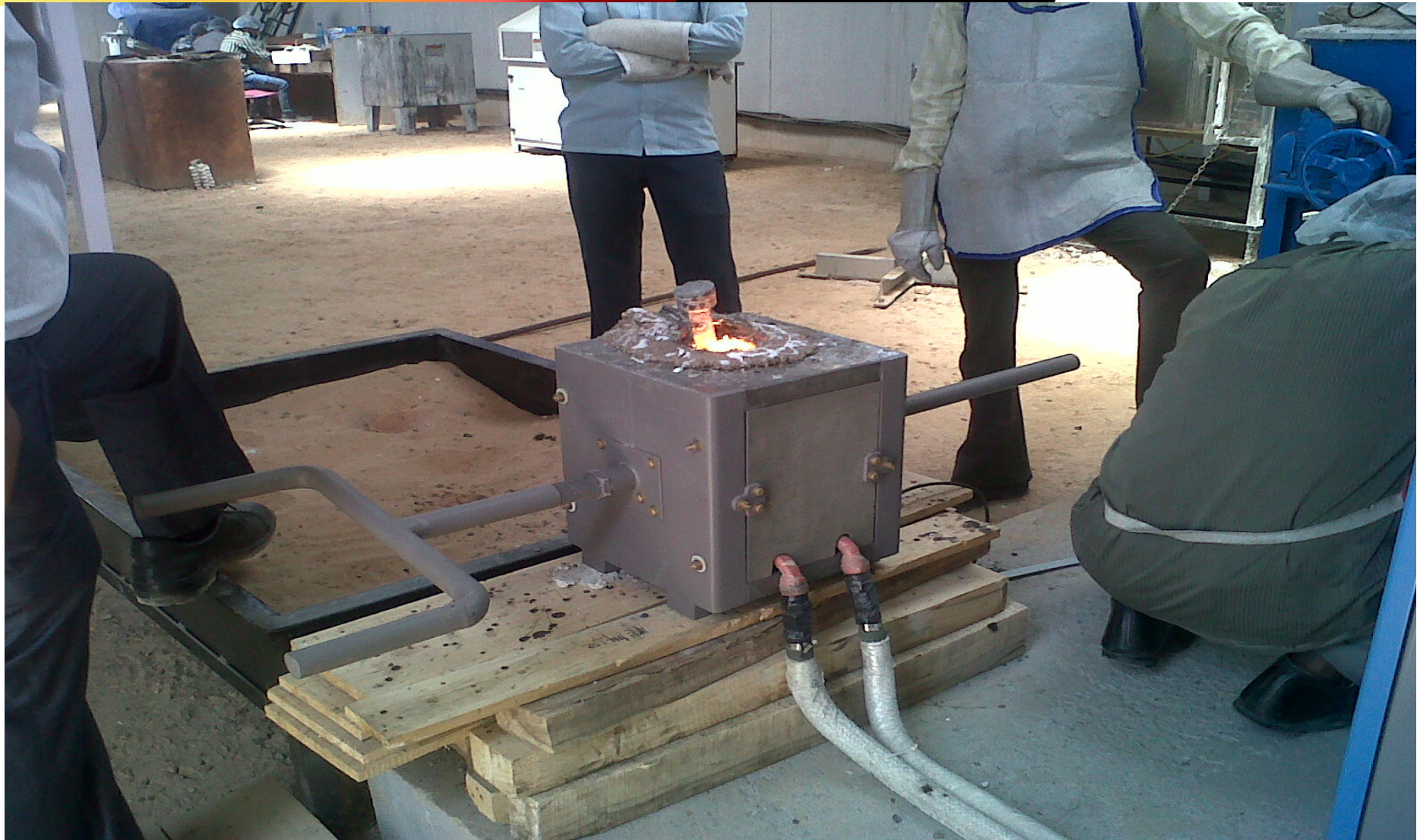


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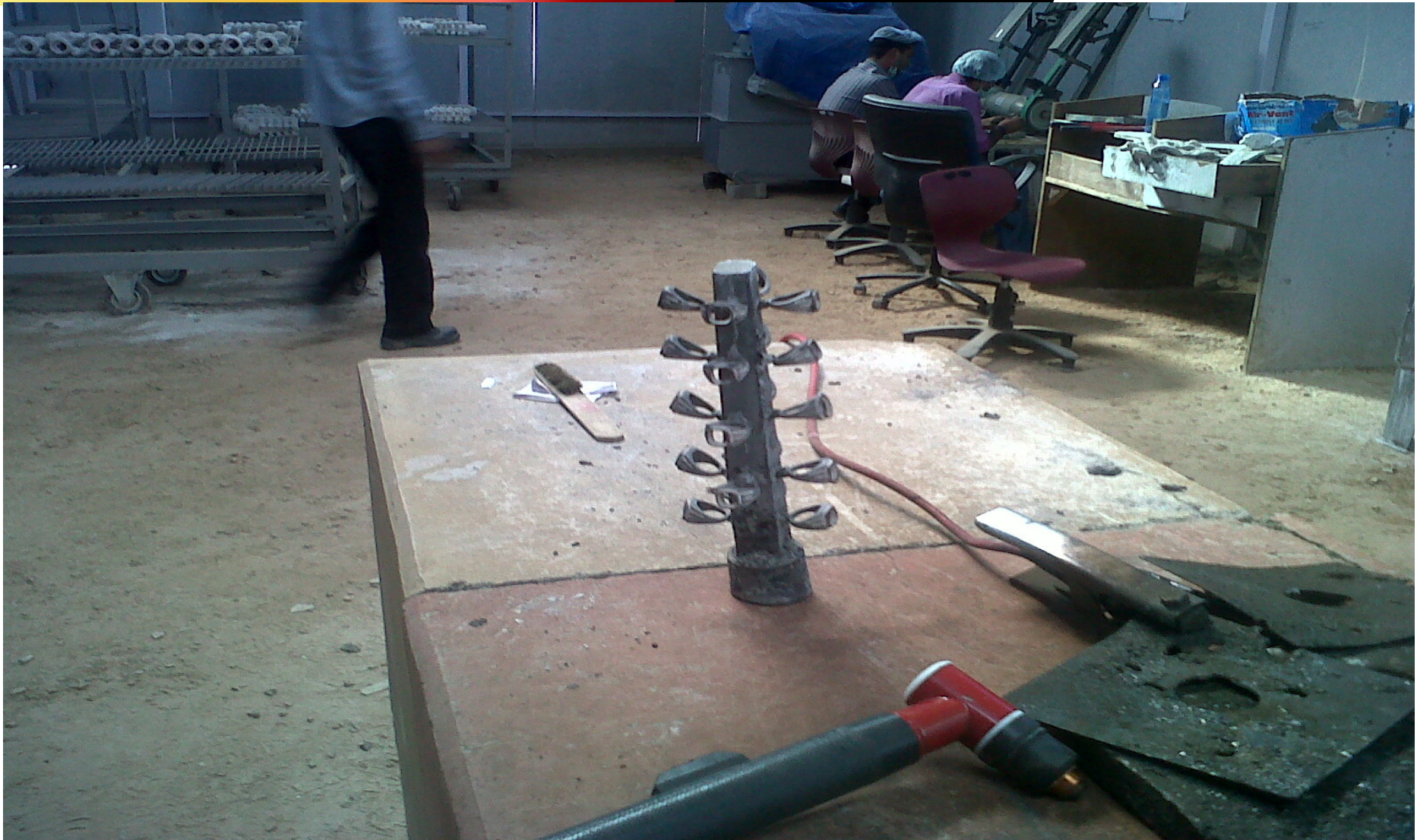


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Installation Photographs

Furnace Size – 175Kw/150Kgs/100Kgs/50Kgs

**Application – Commercial/Defence Casting Manufacturing
Through Investment Casting Process**









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ENERGY MASTER

**DESIGNED TO MONITOR AND OPTIMISE
ENERGY USAGE:**

Energy Monitoring: Measures and records the energy used by up to four inverters.

Energy Optimizer: Measures the energy consumption of the individual inverters and optimise power draw against pre set power kWh.

Sintering Application: A time Vs kW based sinter cycle which can be set a maximum of 18 steps.



ENERGY MASTER

In Mono,Dual, Tri Trak and Multi Trak unit, where we are not able to measure individual inverter energy consumption, EM is very useful tool

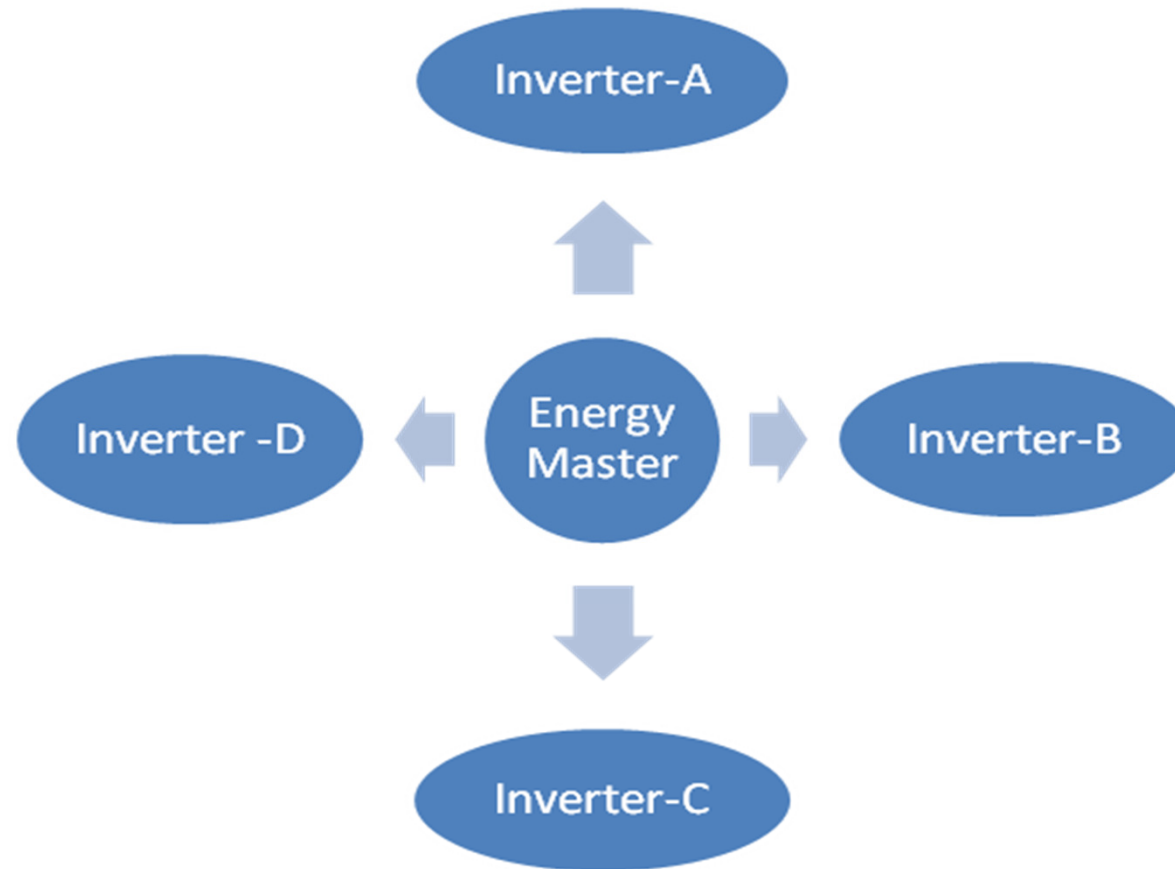
Energy Master can manage maximum 4 inverters, which are installed in 100 to 200 meter apart.

Options:

- With PC and WI – FI facility for SCADA**
- Without PC and WI – FI facility for SCADA (PC Customer Scope)**



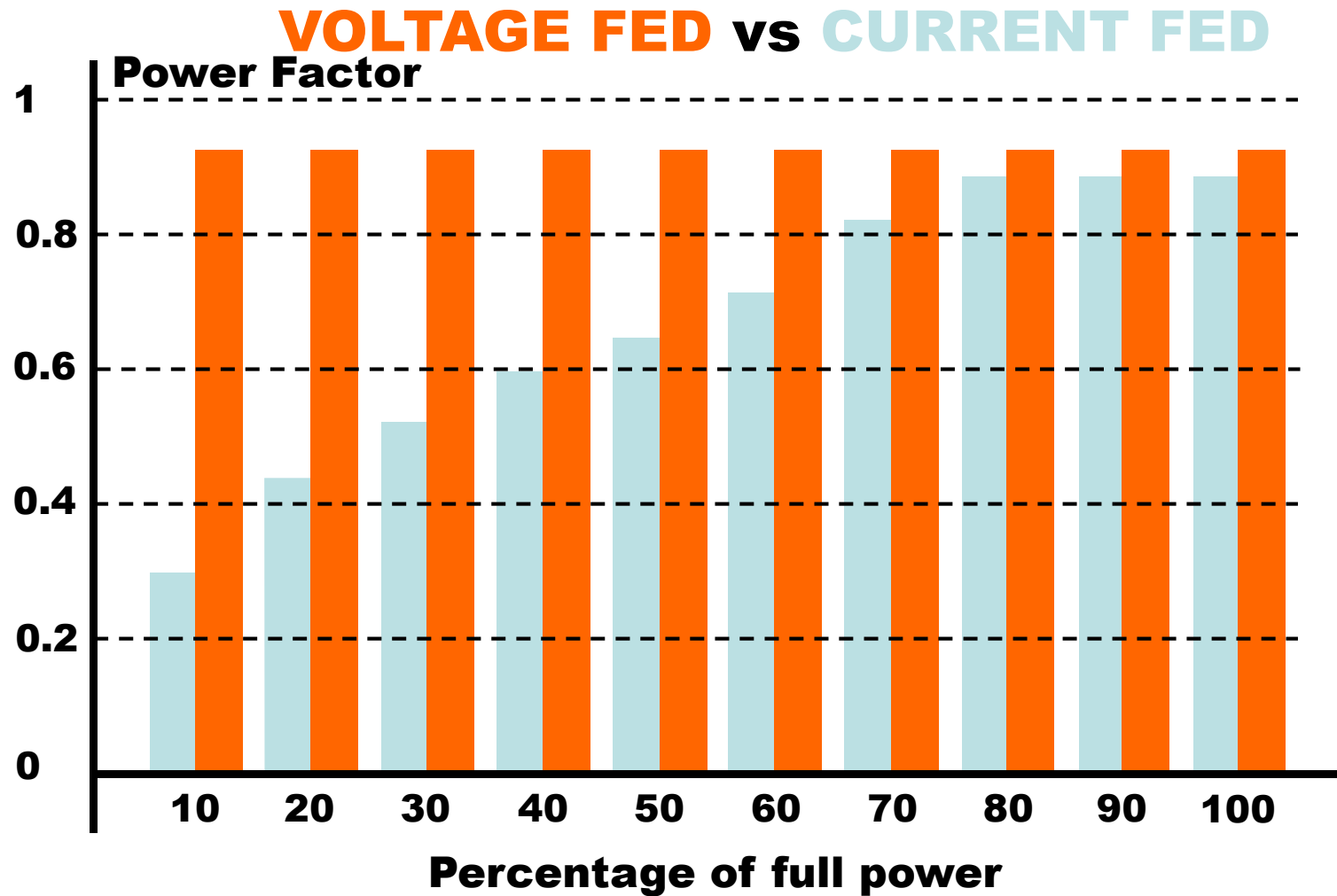
ENERGY MASTER CONNECTED WITH FOUR CONTROL PANELS



INDUCTION FURNACE POWER SUPPLIES CURRENTLY IN USE

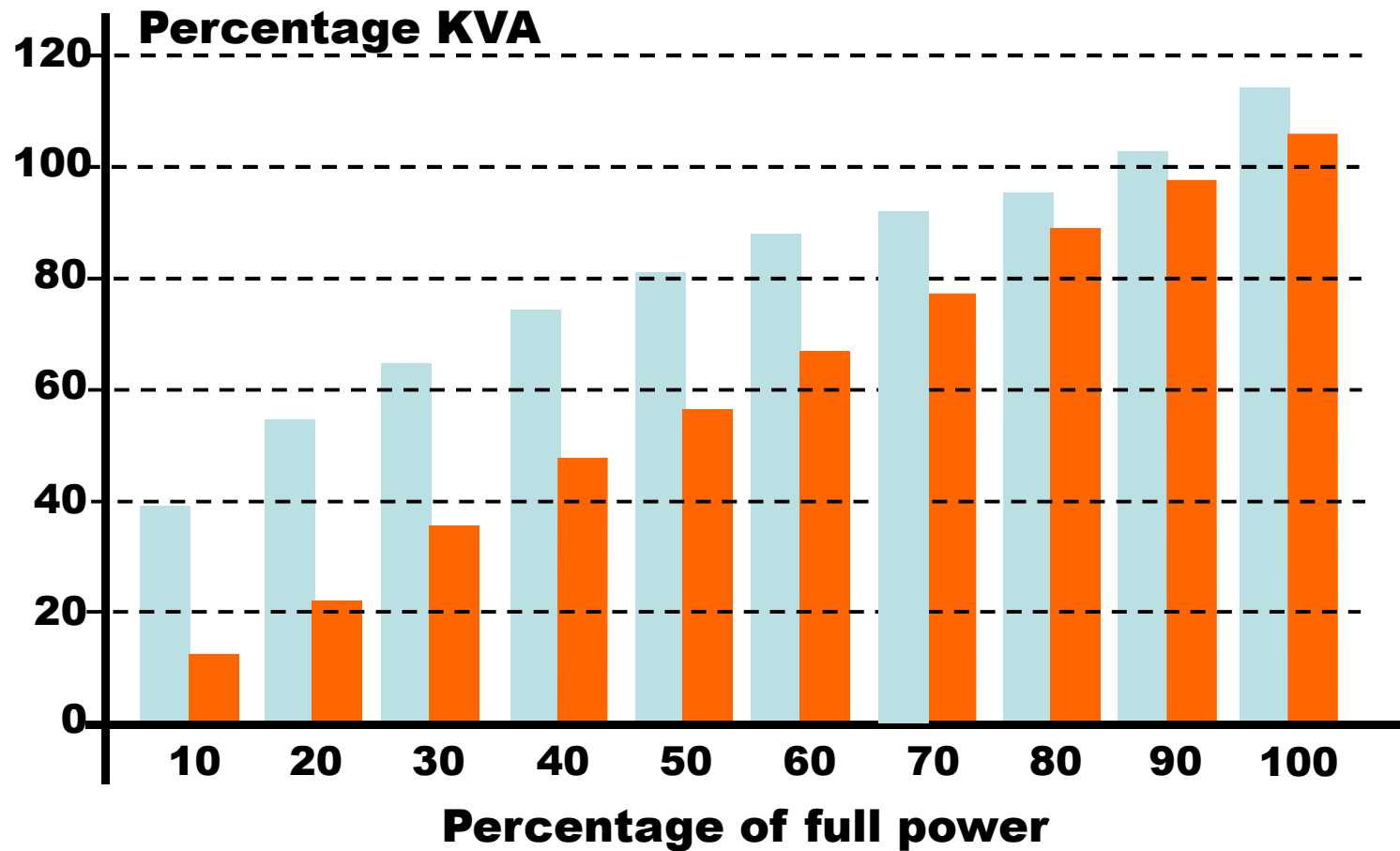
- | | |
|--------------------------------|------------------------------|
| • MAINS FREQUENCY | VERY FEW IN OPERATION |
| • CURRENT FED INVERTERS | FIRST USED 1968 |
| • VOLTAGE FED INVERTERS | FIRST USED 1976 |

LINE POWER FACTOR



LINE INPUT KVA

VOLTAGE FED vs **CURRENT FED**



**A VOLTAGE FED INVERTER WITH AN
UNCONTROLLED AC/DC SECTION
HAS THE
LOWEST KVA RATING
OF ANY INVERTER**

**THE HIGHEST LINE
POWER FACTOR**

**GENERATES THE
LOWEST HARMONICS**

**ALL THESE WITHOUT FILTERS ON A 12 & 24 PULSE
SYSTEM**



Main purpose

- * Precious metal melting in small quantity
- * Sample testing of steel charge mix and DRI
- * For technical institutes

Salient features

- * Compact
- * IGBT based technology
- * Can be offered as mobile unit on trolley





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Application of Precisions Melting



Current Trends in Precious Metal Furnaces



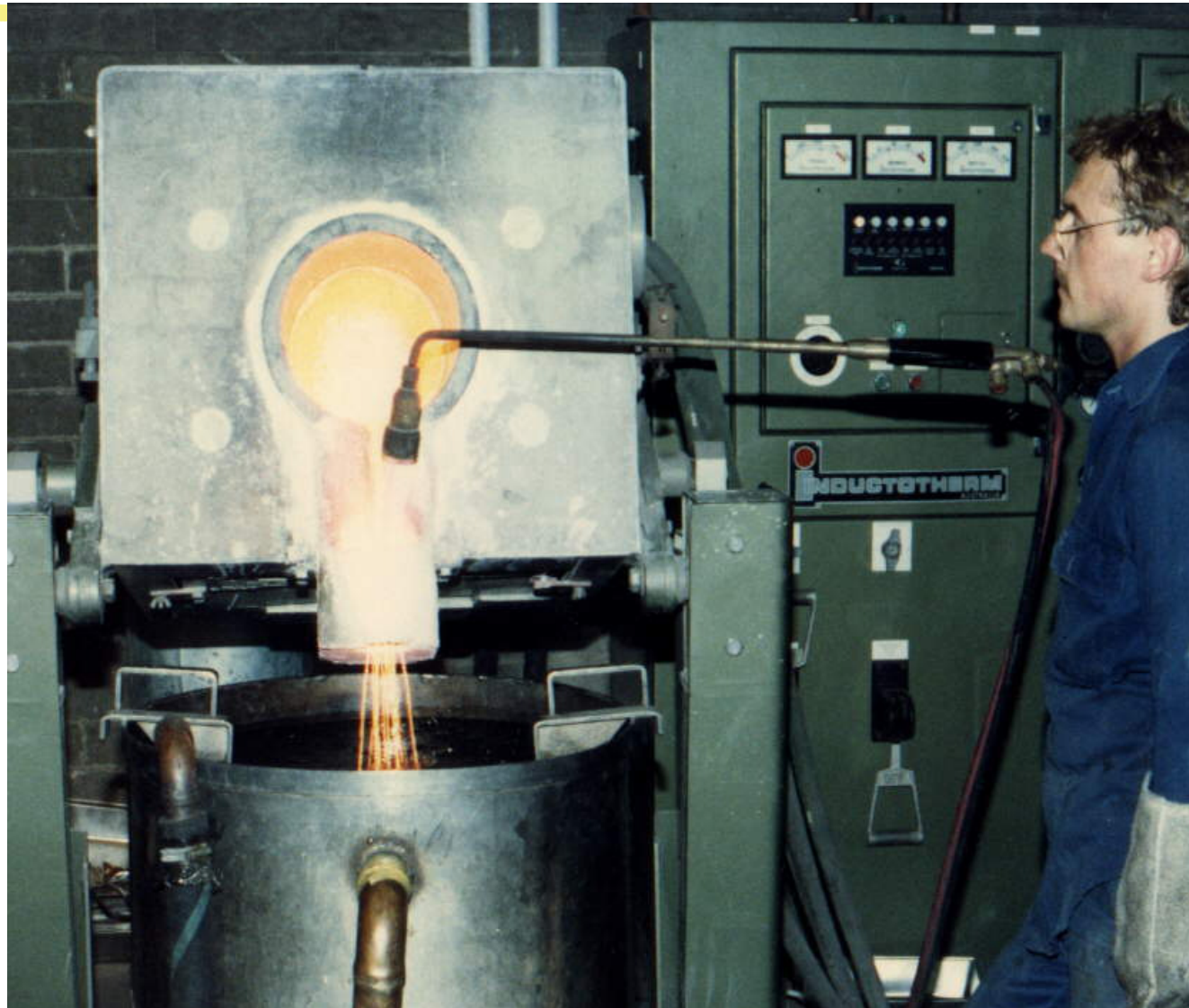
Double Trunion
TP Style Spouted
Crucible
Dura-Line Furnace
complete with
Articulated fume hood





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**Pouring
gold
into
swirling
cold
water**

PLATINUM MELTING



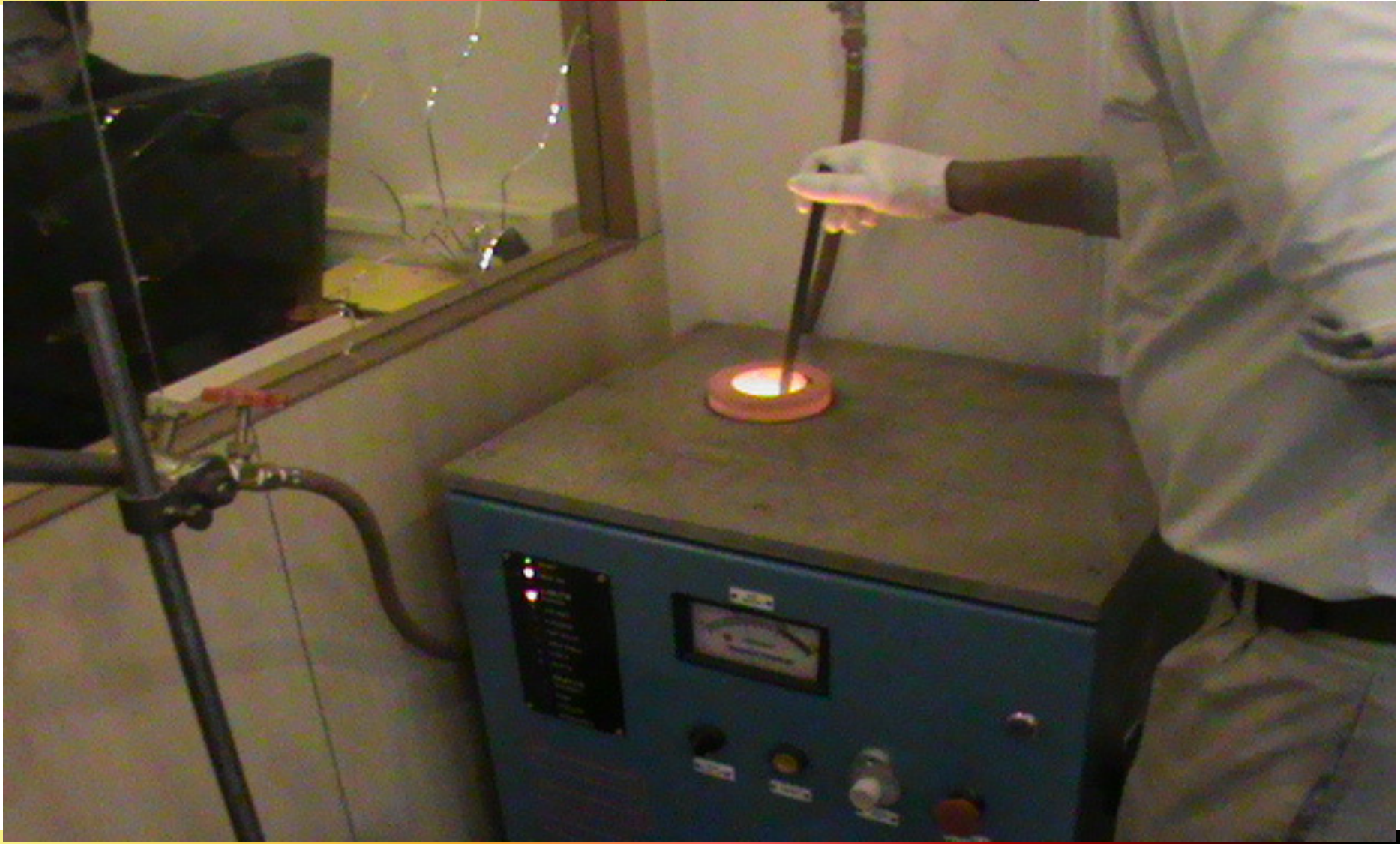
2KG HAND
TILT FURNACE
MELTING
PLATINUM
IN AN
ZIRCONIA
CRUCIBLE





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[illegible]

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www.inductothermindia.com

The World's Largest Gold Coin was Poured From Inductotherm Furnace



Inductotherm is often associated with the words: fastest, most powerful, most efficient and the largest. Now, Inductotherm is proud to be associated with the World's Largest Gold Coin.

This coin was poured from a specially built Inductotherm furnace designed for the Perth Mint. The Coin, 99.99% pure gold weighing one tonne has been valued at more than \$50 Million and measures 800mm diameter x 130mm thick with a kangaroo on one side and The Queen effigy on the other.

The Perth Mint Chief Executive Ed Harbuz says, "Inductotherm worked with us to design and supply a special furnace that could melt 1500 kgs of pure gold, quickly, cleanly, efficiently and safely."

You See Money, We See Metal



Our Customers Trust Us

Inductotherm furnaces are used for making Nickel-Brass alloys, which is the base metal for some of the Indian coins.

Our furnaces are also being used extensively for Cupro-Nickel, Aluminum-Bronze etc.

We advise our customers the right power, frequency and size of the furnaces to achieve best results.

Our thanks to **ARCOTECH LTD.** for the confidence shown on Inductotherm

Retain your competitive edge. Call Inductotherm now at +91 2717 231961 or visit us at www.inductothermindia.com



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Ahmedabad 380 058





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