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Plasma Arc Melting with Cold Wall Induction Withdrawal

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The Plasma Arc CWI Melting Furnace is designed to produce 250mm diameter ingots up to 1500mm in length by combining Plasma Arc Melting (PAM) and Cold-Wall Induction (CWI) melting technologies for alloy optimization. The system is comprised of a main melting chamber housing the plasma torches, dual hearths, and the CWI mold. The furnace includes vacuum isolated feed chambers utilizing cartridge style batch feeders with spoon transfers that will deliver charge materials to each melting hearth in discrete batches. The material is melted in the hearths before being tilt-poured into the ingot mold and retracted to the withdrawal chamber. A main control console is included to monitor and control the operation of the furnace from a remote control room.

The furnace includes the following major components:

1. Two (2) Multi-Cartridge Feeders for Loose Material
2. One (1) Melt Chamber with Isolation Valve
3. Two (2) Retech RP3 Plasma Torches with Torch Manipulators and Bus Bar System
4. Two (2) 450kW Power Supplies with Starters
5. Two (2) Hemispherical Hearths with Stirring Coils
6. One (1) Cold Wall Induction Mold and Coil for 250mm Diameter Ingots
7. Two (2) Withdrawal Chambers with Independent Carts
8. Steel Structure, Support and Decking
9. One (1) Hydraulic System and Power Unit
10. Process Gas Manifold for Argon Operation
11. Gas Delivery System
12. One (1) Compressed Air Systems
13. One (1) Cooling Water Systems - Including Cooling Water Manifolds, Water Cooled Off Gas Piping, as well as Torch and Power Supply Closed Loop Cooling Water Systems
14. Vacuum Systems and Piping
15. Furnace Control System including Main Control Console, PLC with Network I/O System, Camera Viewing System, Motor Control Center and Computers for Torch Profiling, Data Acquisition, and Graphic based HMI.

Process Specification	
Melting Power	Two (2) RP3 Plasma Torches with XYZ Manipulators and 450kW Power Supplies
Cold Wall Induction Crucible	One (1) 250mm Ø Cold Wall Induction Withdrawal Crucible and 1000kW Power Supply
Dual Tilting Hearth System	Two (2) hearths, arranged in series and used for alloy melting and stirring.
Feed Systems	Two sets, one per hearth: two (2) six position cartridge style loose material feeders with spoon
Dual Withdrawal	Withdrawal system for ingots up to 1500mm long
Normal Pump Down Pressure	Melt Chamber, Withdrawal Chamber, Feeder: ≤ 100 mTorr in 30 minutes
Leak-up Rate	Melt, Withdrawal, Bar Feeder: ≤ 2 mTorr/min
Vacuum performance based on clean dry, and empty conditions	

Facility Requirements	
Melt System Minimum footprint	12m X 12m Furnace
Equipment Elevation	-3m to 9m: 12m overall
Pit dimensions	1.7m X 10m X 3m

Buyer Supplied Enclosed Spaces	
Recommended Control Room Size	8m X 5m

Buyer Supplied Crane Equipment	
Normal Operating Maximum Crane Load	5 tons

Water Requirements		
	Flow Rate	Minimum Pressure
Buyer's Facility Water System	200 m^3/hr	5 bar
Buyer's Emergency Water Supply	15 m^3/hr	2 bar
Torch and Power Supply Cooling Make-up Water	A/R	1 bar
Buyer to provide facility cooling water ≤ 32°C		

Process Gas Requirements		
	Flow Rate	Pressure
Argon	100 m^3/hr	5.5 – 8.5 bar
Compressed Air – Continuous	1 m^3/hr	5.5 – 8.5 bar
Compressed Air – Intermittent	170 m^3/hr	5.5 – 8.5 bar

Electrical Requirements					
	Voltage	Hz	Ø	Estimated	
				kVA	kW
Total PDC	440	50	3	200	170
Total Plasma Torch Power	6600	50	3	1070	900
Total Induction Power	440	50	3	1250	1000

Budgetary Pricing ..... Please Call

NOTE: *Does not include installation, spare parts, upgrades, or any other options. Equipment is sold as is and Retech provides no guarantee of condition.*