

# GET A MAXIMUM!



Hybrid Tilting Rotary Furnaces for  
Efficient Aluminium Recycling

- engineering your visions -



[www.kmf.at](http://www.kmf.at)

# BATCHmax CHARGING MACHINE



## Hybrid Tilting Rotary Furnaces from KMF

- Capacities from 2 to 25 tons.
- Operation either with horizontal axis for highly contaminated scrap and thin walled scrap requiring the liquid slag process, or with inclined axis up to 8° for the low salt, dry slag process.
- Quick charging of scrap material with automatic BATCHmax charging system with rotating shovel.
- Rugged horizontal design and high furnace chamber ratio for controlled melting of organically contaminated scraps with up to 8% organics.
- Counter (reverse) flow combustion system for optimum energy efficiency and maximum combustion of hydrocarbons, assisted by optional oxygen injection.
- Real time weighing system with unique precision for immediate materials balance after each charge.
- Tapping valve with positive slag and metal phase separation for clean metal tapping.

# MASTERmax FURNACE



## Model Overview

	MASTERmax 1TR2	MASTERmax 2TR5	MASTERmax 3TR9	MASTERmax 4TR12
Capacity (0°- 8°)	2 - 4 t	5 - 9 t	9 - 19 t	12 - 25 t
Processed scrap per day	16 - 24 t/d	33 - 60 t/d	50 - 80 t/d	102 - 130 t/d

- Unique melt processor MELTmax with scrap data base, salt factor calculation and total process control for repeatable results of melting cycle.
- Compliance with EC emission standards in connection with suitable bag filter unit.
- High yield and low salt additions due to controlled furnace atmosphere, thus minimizing presence of oxygen during melting.
- Special temperature resistant high hot-strength insulation for stability of the refractory lining and long refractory life with low maintenance costs due to non-wetting lining.
- Automatic operation with permanent PLC process control and display of all parameters.



# MELTmax PROCESS CONTROL

## Melt Processor with Touch Panel

- Control panels with the PLC S7-series 300 system.
- Melt processor with scrap data base, salt factor calculation and total process control for repeatable results of melting cycle.
- Automatic operation with permanent PLC process control and display of all parameters.
- All menu levels are also available in local language.



MELTmax Welcome Screen



Process parameter visualization



Control panel for BATCHmax



Scrap database for efficient storing of appropriate scrap data








Real time scale for easy yield and materials balance calculation



Melt recipes with automatic calculation of salt addition

## Operating Figures

The MASTERmax can achieve a 4% - 6% higher yield while consuming 30% - 70% less energy compared to fixed axis rotary and reverberatory furnaces.

Type of scrap	Clean Scrap	Organically contaminated scrap (<8%)	UBC	Chips with max. 5% humidity	Dross
					
Energy Consumption kWh/t*	330-350	250-300	300-330	400-450	250-400
Yield (%)*	90-97	85-90	70-80	88-92	40-65

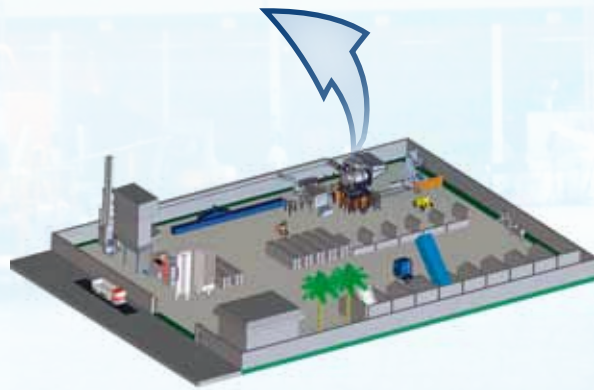
\* Yield and energy consumption may vary from indicated values depending on actual scrap composition, burner type and contamination grade.

# MASTERmax TURN-KEY PLANTS

Design, construction and installation of complete recycling cast houses



- Holding furnace
- Connecting launders
- Ingot casting machine
- Dust filter plants
- Chip processing units
- Scrap boxes
- Thermos ladles for liquid transportation
- Sample crucible
- Vacuum density tester



## Selected Reference Projects



8 t MASTERmax, Hungary



9 t MASTERmax, Turkey



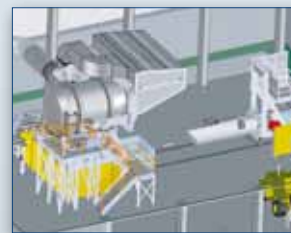
12 t MASTERmax, Spain



12 t MASTERmax, Czech Republic



9 t MASTERmax, Germany



5 t MASTERmax, India



# MASTERmax CYCLE

## Hybrid Tilting Rotary Furnaces for liquid and dry slag process



# MASTERmax SPECIFICATIONS

Furnace Type	MASTERmax 1TR2	MASTERmax 2TR5	MASTERmax 3TR9	MASTERmax 4TR12
Capacity (0° - 8°)	2 - 4 t	5 - 9 t	9 - 19 t	12 - 25 t
Total furnace volume	9 m <sup>3</sup>	14 m <sup>3</sup>	24 m <sup>3</sup>	39 m <sup>3</sup>
Burner power	2.0 MW	2.0 MW	3.0 MW	4.5 MW
<b>Air burner</b>	<b>all figures depending on type of scrap</b>			<b>not available</b>
Specific melt rate	1.0 - 1.5 t/h	1.5 - 2.0 t/h	3.0 - 3.5 t/h	-
Number of cycles per day	5 - 8	4.7 - 6.5	3 - 6	-
Processed scrap per day	16 - 20 t/d	33 - 42 t/d	50 - 57 t/d	-
<b>Oxygen burner</b>	<b>all figures depending on type of scrap</b>			
Specific melt rate	up to 2.0 t/h	2.5 - 3.4 t/h	4.0 - 5.0 t/h	5.6 - 7.0 t/h
Number of cycles per day	6 - 10	6.7 - 9.5	4 - 8	5.2 - 8.5
Processed scrap per day	20 - 24 t/d	48 - 60 t/d	72 - 80 t/d	102 - 130 t/d
Charging door diameter	1.2 m	1.2 m	1.4 m	1.8 m
Total space requirements (incl. furnace, hood, BATCHmax) L x W x H	16m x 8m x 7m	22m x 13m x 8m	23m x 13m x 8m	23m x 13m x 8m
Rotation speed	0.5 - 4 rpm	0.5 - 4 rpm	0.5 - 4 rpm	0.5 - 4 rpm
Tilting angle	-8° to +25°	-8° to +25°	-8° to +25°	-8° to +25°
Refractory thickness (monolithic lining or bricks)	320 mm	220/294 mm	220/294 mm	320/385mm
<b>Charging machine</b>	<b>BATCHmax 1TR2</b>	<b>BATCHmax 2TR5</b>	<b>BATCHmax 3TR9</b>	<b>BATCHmax 4TR12</b>
Volume of charging through	1.5 m <sup>3</sup>	1.6 m <sup>3</sup>	2.7 m <sup>3</sup>	5 m <sup>3</sup>
Max. weight of charging material	1.5 t	2.0 t	2.0 t	3.0 t
Max. length of charging material	2.3 m	3.2 m	3.5 m	4.5 m
Inner diameter charging trough	1.0 m	1.0 m	1.15 m	1.65 m
Charging cycle time (door opening time)	ca. 80 s	ca. 80 s	ca. 80 s	ca. 80 s
<b>Utilities</b>	<b>1TR2</b>	<b>2TR5</b>	<b>3TR9</b>	<b>4TR12</b>
Power supply (400V, 50Hz)	60kW	75kW	81kW	105kW
Selected optional items	Interface for production data acquisition, Oxygen injection system, Launder system, Furnace cleaning tools, Dross collecting device, Additional training, Production supervision, Gas/Oxygen burner system, Permanent exhaust fumes measuring system, Filling station for the charging machine BATCHmax, Telediagnosis system. Additional options available on request.			



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