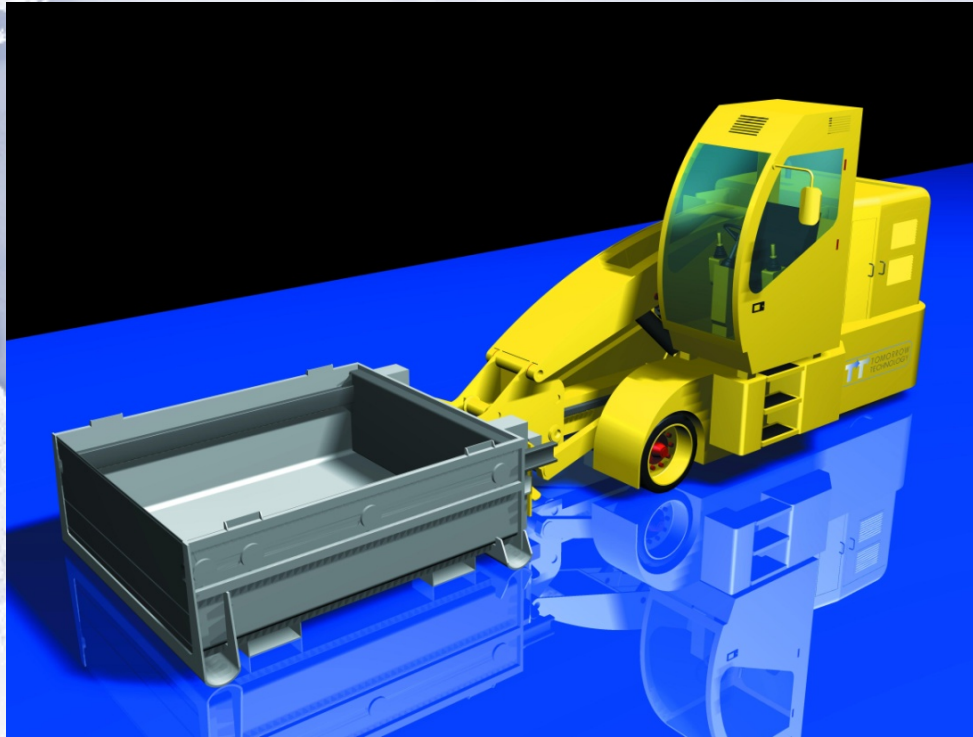
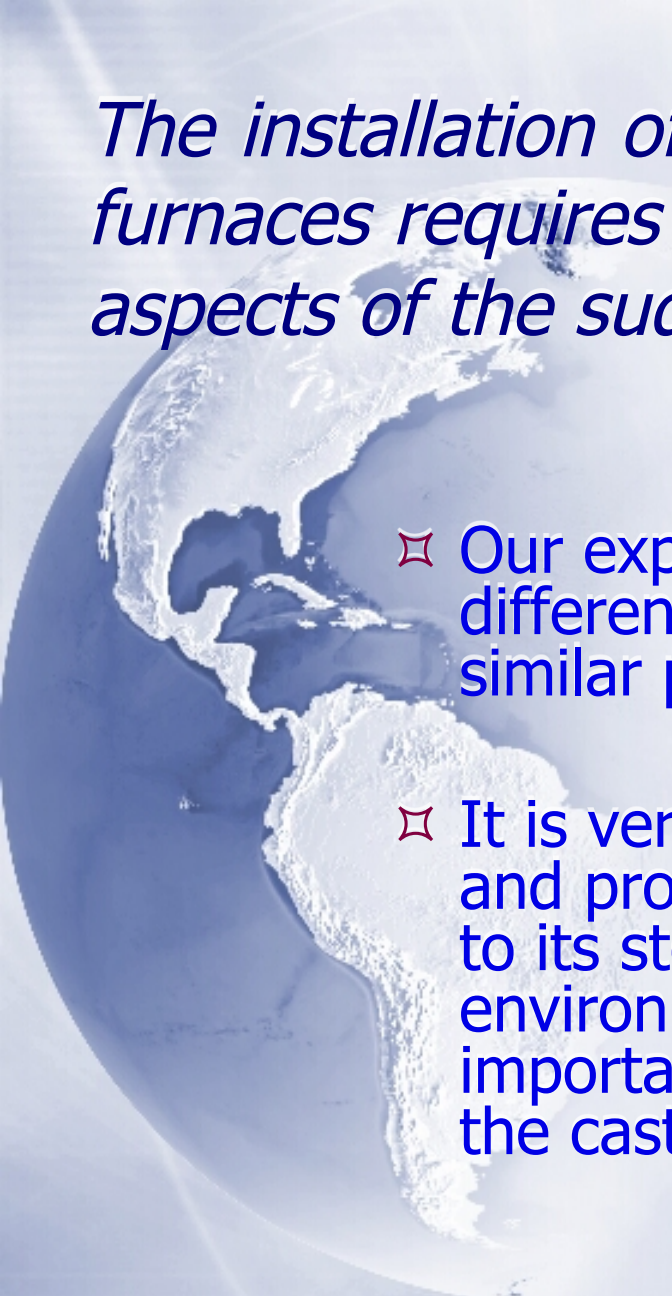


*Improving Productivity, Efficiency and Safety in  
Aluminium Cast House Operation through T.T.  
MULTIFUNCTIONAL FURNACE TENDING VEHICLE*





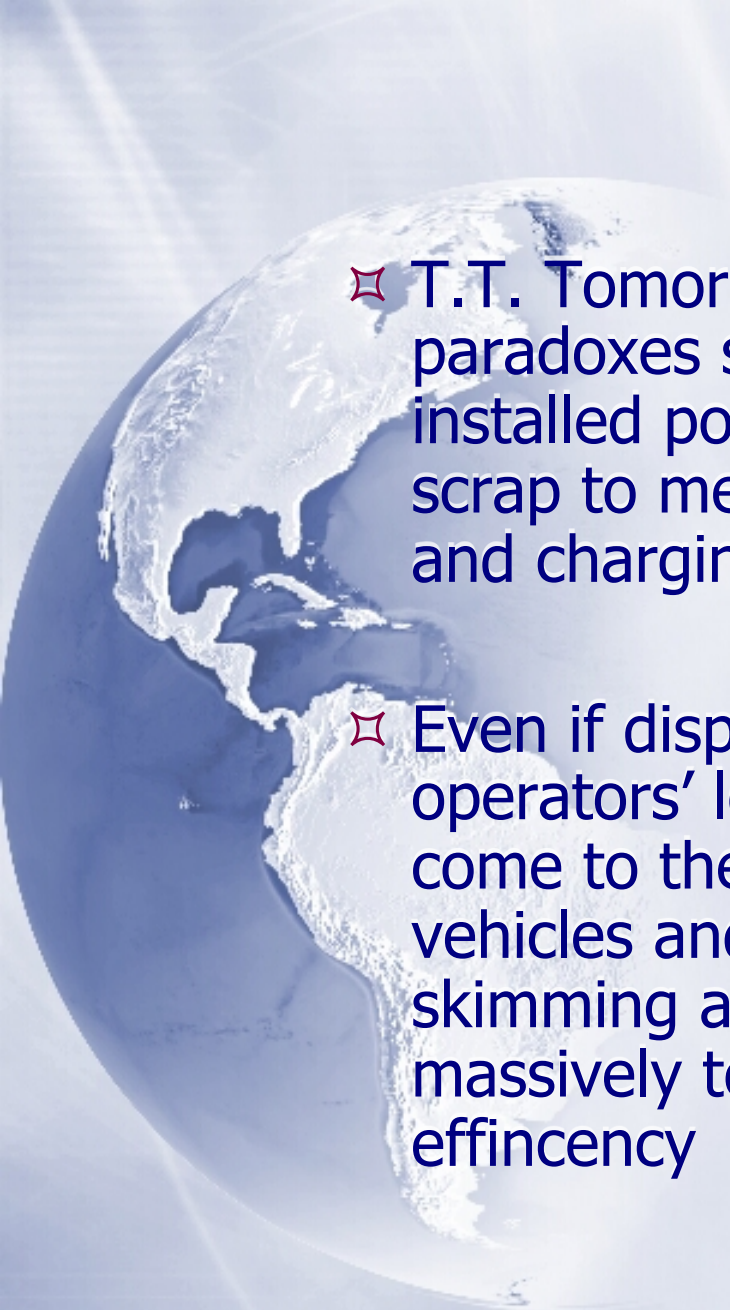
*The installation of high quality and efficient melting furnaces requires a systematic approach towards all aspects of the subsidiary furnaces operation*

- ✧ Our experience teaches us that every plant has different characteristics with comparison to other similar plants.
- ✧ It is very essential to analyse every elements and productive peculiarity, from scrap typology to its storage, from the dross production to the environment conditions and whatever is important to propose machines fit to implement the cast house efficiency.



*T.T. Tomorrow Technology is working in close concert with the Aluminium Producers and their operator to ensure that the investment fully meets the customer's expectations.*

- ✧ Normally every Company operating in this field makes use of transport and handling vehicles available on the market even though not specifically fit and designed for their purpose.
- ✧ I am making reference to standard forklift, front-loader trucks as well as fixed solution , some of them even very bizarre.

- 
- ✧ T.T. Tomorrow Technology has experienced paradoxes such as having a good melting installed power and a large quantity of metal or scrap to melt but a inefficient skimming, cleaning and charging capacity for the furnaces.
  - ✧ Even if disposing a high professionalism and operators' long experience in the cast house we come to the conclusion that using dedicated vehicles and equipment for transport, charging, skimming and handling in general contributes massively to the cast house economy and efficiency



*Among the most important operations of the melting activity which, upon our experience, will be greatly improved by the implementation of dedicated vehicle and equipment we are considering the following:*

- ✧ Furnace charging of aluminium scrap, T-bars, slabs, ingots, etc.*
- ✧ Furnace skimming, de drossing and stirring operations.*
- ✧ Furnace bottom and side walls cleaning.*
- ✧ The alloying with silicon and other additives.*



## *Main Features of **T.T.** Multifunctional **Furnace Tending Vehicle***

- ❖ High easy of use.
- ❖ Wide manoeuvrability.
- ❖ High precision.
- ❖ Rapidity of operations.
- ❖ Low maintenance cost.



# *Test Case: Furnace Tending Operation*

<b>Description of Operation</b>	<b>Forklift</b>	<b>MFTV</b>
<b>Speed &amp; easiness of discharging</b>	*	****
<b>Distribution of the material inside the furnace</b>	*	****
<b>Accuracy of operation, skimming, cleaning and charging</b>	**	****
<b>Driver visibility</b>	*	****
<b>Driver working conditions &amp; safety</b>	*	****
<b>Charging capacity</b>	**	****
<b>Skimming &amp; cleaning efficiency</b>	*	****
<b>Manoeuvrability inside the cast house</b>	**	***
<b>Versatility of use</b>	NONE	***

Legenda: \*poor, \*\* fair, \*\*\* good, \*\*\*\* excellent

*T.T. Multifunctional Furnace Tending Vehicle mod. SK  
for charging, de-drossing, cleaning and alloying.*





# *Furnace Charging Operation*





# *Basic Advantages of a dedicated Vehicle for Charging Operation*

- ✧ Speed and precision in furnace charging with minimization of the opening time of the furnace doors, of the temperature falls and of the consequent energy and metal-oxidation losses.
- ✧ Quick discharging of many tons of scraps by means of special boxes and in rapid sequence.
- ✧ Optimal distribution of the solid metal inside the furnace, improving the furnace output and reducing the dross production.
- ✧ Prolongation of the furnace living life.
- ✧ Reduction of waves and splashes during furnace charging.
- ✧ Reduction of hydrogen absorption.
- ✧ Avoid people for working within the high-risk operative area.





## *Basic Limitations related to the use of non-dedicated Vehicle or Equipments for Charging Operation*

- ❖ Large space availability needed for operating and parking.
- ❖ Long performance time for operations.
- ❖ High cost for modification and/or adjustments in case of furnace height modification.
- ❖ Operator' poor visibility.
- ❖ High exposure of the operator likely to be reached by metals splashes.



# *De-Drossing Operation – photo 1*





# *De-Drossing Operation – photo 2*





# *De-Drossing Operation – photo 3*





# *Furnace Cleaning Operation – photo 1*





# *Furnace Cleaning Operation – photo 2*

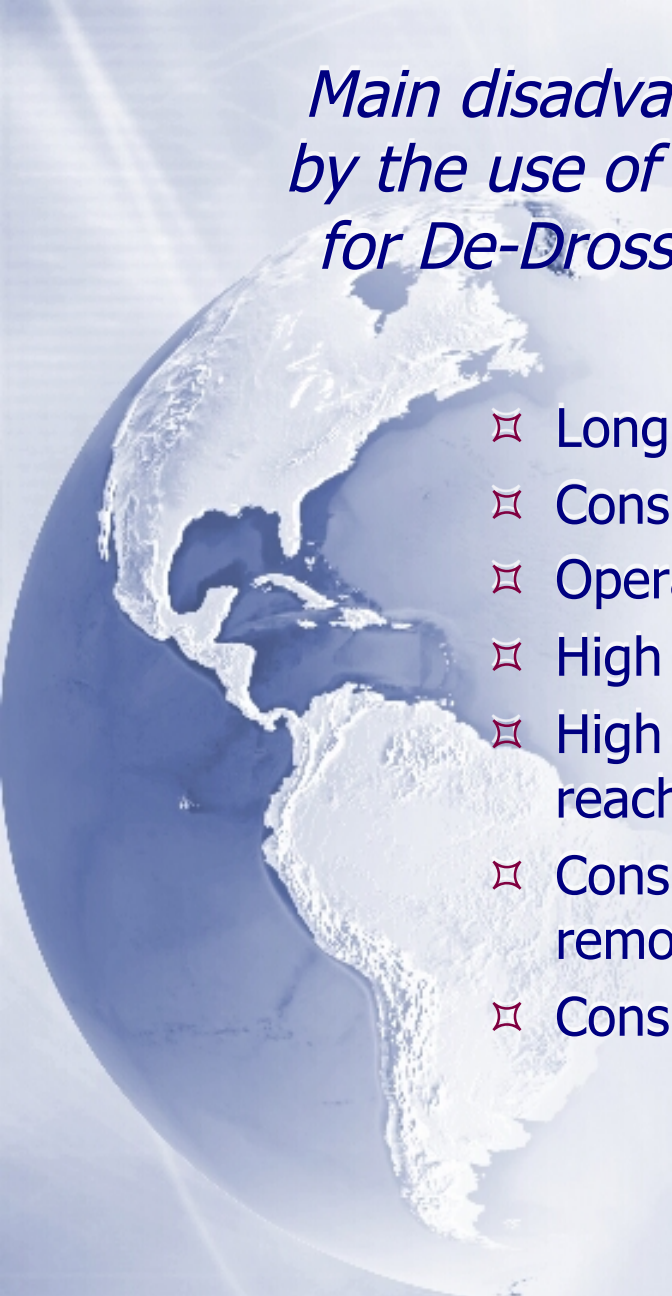




# *Furnace Charging Operation – photo 2*







*Main disadvantages and problems which are raised by the use of non-dedicated vehicles and equipment for De-Drossing & Cleaning of aluminium furnaces*

- ❖ Long performance time.
- ❖ Considerable damages to the furnace refractory lining.
- ❖ Operator's poor visibility
- ❖ High heat exposure for vehicles not fit for this purposes
- ❖ High heat exposure for the vehicle operator likely to be reached by metal splashes.
- ❖ Considerable control difficulty of the dross to be removed
- ❖ Considerable cleaning difficulty of the furnace bottom.



# *Summary of the advantages to use T.T. Multifunctional Furnace Tending Vehicle*

- ✧ Charging time reduced by 60 up to 75%.
- ✧ De-drossing time reduced by 80%.
- ✧ No damages to the refractory lining.
- ✧ Operator's high visibility.
- ✧ Absolute safety of operators' and vehicle working conditions based on the necessary protection as well as to the cabin case hardened safety glass protected by metal grid.
- ✧ Precise control of the charging box.
- ✧ Precise control of the dross to be removed reducing the amount of aluminium in the dross.
- ✧ Quick performance of these operations reducing the opening time of the furnace doors, the metal cooling, energy losses as well as metal losses for oxidation.
- ✧ Reduction of hydrogen absorption

# *Final considerations*

- ✧ In accordance with our experience the investments on dedicated vehicles and equipments for casthouse operation enhance and improve the quality of your works and of your products.
- ✧ We can assert that the investment economical return comes, above all, from the operation rapidity within the furnace (so from the energy saving, the reduction of aluminium content into the dross and the increase of living life of the furnace.)
- ✧ Dedicated vehicles and equipment have lower operating cost as result of systematic development of mechanical design and careful choice of their components.
- ✧ Working conditions of the casthouse's operators will be improved as well as a better and more friendly environmental will be achieved.