









**Fig. 11.** Conceptual diagram of furnace for recycling of magnesium alloy process scrap



**Fig.12.** View of the furnace for recycling of magnesium alloy process scrap

## CONCLUSIONS:

Based on the results of conducted experiments related with the effect of chemical modification and addition of process scrap resulting in endomodification (spontaneous modification) of primary magnesium alloys in the form of pure ingots it can be concluded that:

- In the case of primary alloys (pure ingots), modification with Mikrosal MT 200 produced significant grain refinement, particularly evident in heavy-walled castings. Gas refining in this case slightly increased the grain size in the casting.
- No effect of modification with Mikrosal MT 200 was observed in the case of alloy with 100% content of process scrap. Average grain size was nearly 4-5 times smaller than in the alloy obtained from pure ingots.
- Gas refining after the chemical modification did not change the grain size and it was stable irrespective of the casting wall thickness (crystallisation rate).
- Addition of process scrap (originating from the pressure die casting process on hot- and cold-chamber machines) introduced to primary magnesium alloys significantly reduced the grain size in castings from both the examined magnesium alloys, i.e. AZ91 and AM50.
- A clear effect of endomodification of the primary magnesium alloy occurred in the range between 30 and 70% of the process scrap added.

- Grain size in magnesium alloys consisting in 100% of process scrap was much smaller than in the primary alloys (pure ingots).
- Gas refining of alloys containing process scrap did not significantly change the size of grains in the AM50 alloy, while in the AZ91 alloy (from hot chamber machines) it caused a slight increase of the grain size. In this case, during the process of refining, the nuclei of crystallisation in the form of carbide inclusions were removed from the grains.
- Gas refining stabilised the grain size in castings regardless of the wall thickness (solidification rate).

## References

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