



CATALOGUE



Non-ferrous metals foundries

Industrial furnaces and dryers

Refractory castable shapes

 *Art of heating*

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Holding furnaces – PTU

- Electric holding furnace with a **crucible with direct heating** and with **automatically closing cover**
- **Low power input - extremely low power consumption** - PTU have been designed so as to provide as low energetic demands and energy losses as possible.
- **Considerably lower maintenance costs** when compared with the standard stationary furnaces
- A heated crucible is made of special refractory concrete with imbedded heating coils which forms a base of this furnace.
- The furnace is insulated with the latest insulation materials.
- In order to achieve losses as low as possible, the furnace in its standard configuration is fitted with an automatically closing cover that will allow furnace opening only when it is necessary (up to 70% savings in energy costs).
- The automatic cover is controlled either with signals from the machine or manually by the operator by means of a foot-operated pedal.

3 types of furnaces produced by default

Type	Tmax [°C]	Crucible volume [l]	Capacity [kg Al]	Power [kW]	External dimensions [mm] wxhxd	Total weight [kg]
PTU 300/85	850	110	295	12	1050x950x930	430
PTU 500/85	850	180	485	16	1250x1150x1130	570
PTU 800/85	850	360	970	22	1370x1250x1240	790

Technical changes reserved



Technical description

- The basis of furnace is a special LAC NANO crucible, with heating coils which are embedded in the wall.
- Crucible is isolated with the latest insulation materials. Quality of this insulants help to reduce demensions of furnace.
- Automatically closing cover and LAC NANO heating crucible are already included in price if furnace.
- Power is supplied via the isolation transformer, which creates a safe voltage, ie. there is no harm of electrical injury.
- There is no emergency spout on PTU furnace. There is special bulk insulation surrounding whole crucible which prevents melt to leak out. Melt stay in the crucible instead as it cannot leak throuh the insulation.

- Low service costs - no need to change heating coils and crucible, it is recommended to replace LAC NANO crucible every six year (4300 hours), which is in the price range of standard SiC crucible.
- Low energy demands of furnace PTU complement results of comparative measurements of commonly used customer's furnaces.

For the calculation is considered :

- Annual operation 300days = 720hours
- Annual energy savings – 1kW/hour = 7200 kW/year
- Price of energy – 1kW = 2,50 CZK

Every 1kW/h = € 1000,-/year

Comparison of consumption of different types of furnaces operating in automatic cycle *			
Crucible size	Classical furnace with crucible and open cover	Classical furnace with crucible and automatic cover	Furnace LAC PTU
	[kW]	[kW]	[kW]
BU 300	18,0-22,0	15,5-19,5	12,5
BU 500	22,0-27,0	19,5-24,5	15,5
BU 800	26,5-31,5	23,5-28,5	19
* Tact of press 60s, Cover closed for 40s, weight of casting 2000g, smelt temperature 700°C, cast iron ladle			

Comparison of consumption of different types of furnaces operating in manual mode *			
Crucible size	Classical furnace with crucible and open cover	Classical furnace with crucible and automatic cover	Furnace LAC PTU
	[kW]	[kW]	[kW]
BU 300	9,5-13,5	5,5-9,5	3
BU 500	14,0-19,0	8,0-13,0	4,5
BU 800	18,0-23,0	10,0-15,0	6,5
* Tact of press 300s, Cover closed for 270s, weight of casting 3000g, smelt temperature 700°C, cast iron ladle			

Furnace power consumption in stabilized condition [kW] full furnace				
Furnace type	Holding at 700°C		Holding at 800°C	
	Closed cover	Open cover	Closed cover	Open cover
PTU 330/85	1,5	6,2	1,8	7,7
PTU 500/85	2	10	2,4	12,3
PTU 800/86	2,7	13,8	3,3	16,8

Technical changes reserved

LAC NANO crucible for non-ferrous metals with nanotechnology used

Characteristics and range of use of LAC NANO crucibles

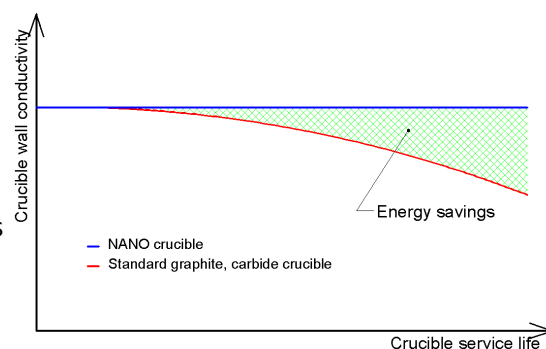
LAC NANO crucibles are constructed for electric resistance and gas furnaces.

Characteristics:

- excellent thermal conductivity
- constant thermal conductivity through whole lifetime
- crucible material is completely resistant to chemicals
- material does not oxidize and therefore keep constant melting rate through its whole lifetime
- high resistance to thermal shock
- easy to clean workspace of crucible
- very high heat resistance
- severalfold better mechanical properties (tested in pressure - strength, abrasion resistance, etc.)
- sump for thermocouple must be protected against dirt
- thermocouple must be inserted to the bottom of sump
- life time of crucible is in the testing phase, the assumption is several times higher compared to commonly used crucibles, but not fully tested yet (tests carried out 6 months and we have not seen any changes of its properties or abrasion)

Range of use:

- cups can be used for alloys of Al, Cu, Zn, Pb, precious metals
- temperature range of use 200 – 1300°C
- for all electrical resistance and gas maintenance furnaces
- for all electrical resistance and gas melting furnaces
- for all above mentioned furnaces using refinery, covering and modifying salts.



Materials used for producing LAC NANO crucible.

Refractory raw materials of the highest purity and stable quality from selected, time-proved manufacturers in combination with unique engineered nanomaterials based on the latest advances in nanotechnology research (the formula is constructed to achieve maximum values of strength, thermal conductivity, chemical resistance and thermal shock).

Crucible material including coating is developed by using nanotechnology. The aim of this coating is to increase size of surface and increase heat absorption. Desired properties are achieved thanks to coating consisting nanoparticles of special iron, surface-modified oxides of other metals with aim of stabilizing the nanoparticles in the temperature range of use and set the emissivity approaching 100%. Modified nanoparticles have a surface area 25 m²/g, which guarantees the highest possible emissivity and thermal conductivity.

All used materials has been developed in collaboration with NANO IRON company (www.nanoiron.cz) and regional center of advanced technologies of Palackého University in Olomouc.

- outer coating has a maximum emissivity, maximum surface area and thermal conductivity
- interior coating has the same function as the outer coating, but it has developed binder system, which is extremely heat resistant after curing. (penetrates to a depth of several mm and increases resistance crucible wall material)
- mechanical abrasion of outer and inner coating does not affect the lifetime of the crucible

Application of described NANO material results in:

- flow of heat increase in crucible
- increase of melting performance of furnace
- reducing the average temperature in the furnace heating chamber (between the heating elements and crucible)
- reduction of energy consumption (kW/kg of castings)
- increased the lifetime of heating elements
- increased energy efficiency of furnace



LAC NANO crucible



Raster detail – external surface of crucible

LAC NANO crucibles are standardly produced in cca 250 types. Sump for thermocouple is included in most of its types.

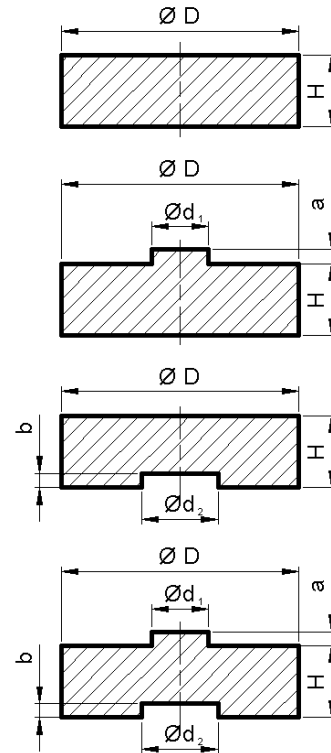
Production of the entire company is subject to meticulous final inspection in accordance with EN ISO 9001:2009

Pads under crucibles

Washer is used to accurately establish the crucible in the furnace and has an impact on the lifetime of the crucible. For this reason, the manufacturer recommends LAC NANO cup washer of the same material as the crucible.

A standard range is listed in the table; atypical pads can be produced on the basis of an order.

$\varnothing D$ [mm]	H [mm] min-max	a x d ₁ [mm]	b x d ₂ [mm]
150	50-200	10 x 85	17 x 95
200	50-250	10 x 85	17 x 95
220	50-250	10 x 85	17 x 95
240	50-300	10 x 85	17 x 95
260	50-350	10 x 85	17 x 95
280	50-350	10 x 85	17 x 95
300	50-350	10 x 85	20 x 200
320	50-400	10 x 85	20 x 200
355	50-400	10 x 85	20 x 200
375	50-400	10 x 85	20 x 200
400	50-400	10 x 85	20 x 200
440	50-400	10 x 85	20 x 200
460	50-400	10 x 85	20 x 200
500	50-300	10 x 85	20 x 200
540	50-300	10 x 85	20 x 200



Standard pad heights H are stepped by 50mm

Height range: H 50, 100, 150, 200, 250, 300, 350, 400



Rising tubes

Rising tubes for batching furnaces

They are used for precise melt batching from the batching holding furnace into the high-pressure casting machine. They are made of white pottery containing additives for improvement of strength. The rising tubes made of this material fully substitute conventionally used ceramic tubes.

Rising tubes for low-pressure casting

They are used for precise melt batching from the low-pressure holding furnace into the casting ingot mould. They are made of special refractory concrete developed for contact with molten aluminium. The rising tubes made of this material represent an adequate substitution of the conventionally used ceramic tubes.

Melting and holding electric furnaces with ceramic fibre insulation – PTV, PTE

- The latest innovation trend in the field of electric melting and holding crucible furnaces
- Maximum energy efficiency is achieved with utilization of the advanced insulation materials and an optimum design of lining.
- They represent 50-80% savings when compared with the furnaces lined with conventional lining heated with coils or heating panels
- Energy savings ensure quick return of investment in the new equipment.

Considerable savings can be achieved by replacement of the older equipment, please see the Datasheet

Saved 1kW/h = € 1000/year



For more detailed information on PTE and PTV furnaces and on the calculation of savings and return of investment please see the Technical Datasheet, p. 17

Furnace power consumption in stabilized condition [kW]						
Furnace type	Holding at 700°C		Holding at 800°C		Holding at 900°C	
	Closed cover	Open cover	Closed cover	Open cover	Closed cover	Open cover
PTE 30/09	2,5	5	3,3	6,2	3,7	7,1
PTE 60/09	2,8	5,5	3,6	6,5	4,1	7,9
PTE 110/09	3,4	7,1	4,4	8,6	5	9,8
PTE 210/09	3,8	7,4	5,1	9,2	5,7	10,6
PTE 330/09	4,6	9,2	6,1	10,9	6,9	12,9
PTE 400/09	4,8	9,5	6,3	11,2	7,1	13,2
PTE 500/09	6	11,2	8	14	8,9	16,5
PTE 650/09	6,5	12,2	8,6	15	9,4	17,9
PTE 800/09	7,5	14,1	9,8	17,8	11	20,1

Please compare the power consumption of your furnace without cover with the table of power consumption with closed and open cover

Energetic audit

It is used for determination of furnace power consumption for a certain time unit (shift, day, etc.) The results of the energetic audit are assessed after measuring and such a solution is offered that eliminates unnecessary energetic losses and will ensure cost reduction.

A service team that will connect a recording device storing data for the determined period (progress of power consumption in time, progress of temperatures) to the measured furnace is sent to the customer. The measured values are submitted to the specialists from the LAC s.r.o. technical office who will propose variants of potential energetic savings.

A complex technically supported quotation is prepared for the customer on the basis of such analysis.

Price for energy audit is 263 EUR for one electric device + travel expenses.

Energy audit is free of charges for customers who purchase furnace from us.

Automatically closing cover

It is used in order to reduce thermal losses considerably. If the furnace cover is open or if the furnace is used without cover, high and unnecessary energetic losses take place. These losses can be eliminated simply by installation of the automatic cover. It was found out on the basis of long-term development and measuring that the installation of the automatically closing cover results in holding furnace power consumption by up to a half, please see the table in p. 4.

Saved 1kW/h = € 1000/year

Reduction of melt thermal losses in the holding furnaces for aluminium die casting

Use of the cover on the holding furnaces for aluminium die casting represents considerable energy savings. The holding furnaces are kept open all the time during the operational cycle currently which results in considerable energetic losses. The automatic cover minimizes losses by leaving the holding furnace open only for the period necessary for molten metal to be taken up with the ladle. The automatic cover operates in the casting tact of the machine. It means that the cover is open only during the period when molten metal is taken up with the ladle; cover closing is synchronized with ladle movement towards the casting machine.



SiC iron chills

- They are intended for controlled solidification of the castings made of steel, cast iron, **aluminium** and other metals.
- Condensation of atmospheric humidity does not take place and any problem with occurrence of pinholes under the iron chills virtually does not exist - considerably longer service life with comparable purchase price
- Weight reduced to a half when compared with cast iron chills
- Constant mechanical properties in the effective area at thermal cycling
- Wearing of working tools during machining is reduced
- SiC iron chills have virtually eliminated problems with turbidity met in some thin-walled castings made of perlitic-ferritic and perlitic LLG and LKG with complicated shapes
- Casting surface hardness is lower and its mechanical properties are more stable



The standard iron chill types are listed in the table below. Atypical iron chills can be produced on the basis of consultation; however, their prices are higher.

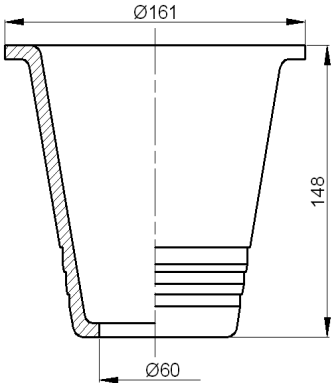
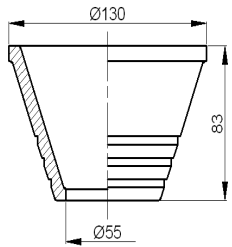
Dimensions (h x w x d) [mm]	Capacity [dm ³]	Weight [kg]
250 x 125 x 65	2,031	4,672
200 x 100 x 100	2,000	4,600
200 x 100 x 50	1,000	2,300
200 x 100 x 40	0,800	1,840
200 x 100 x 30	0,600	1,380
200 x 50 x 50	0,500	1,150
200 x 50 x 30	0,300	0,690
200 x 40 x 30	0,240	0,552
170 x 125 x 65	1,381	3,177
150 x 80 x 40	0,480	1,104
150 x 80 x 30	0,360	0,828
150 x 60 x 40	0,360	0,828
150 x 50 x 50	0,375	0,863
150 x 50 x 40	0,300	0,690
140 x 70 x 40	0,392	0,902
100 x 100 x 50	0,500	1,150
100 x 100 x 40	0,400	0,920
100 x 100 x 30	0,300	0, 690
100 x 70 x 50	0,350	0,805
100 x 50 x 50	0,250	0,575
100 x 50 x 40	0,200	0,460
100 x 50 x 30	0,150	0,345
100 x 50 x 20	0,100	0,230
100 x 40 x 40	0,160	0,368
100 x 40 x 30	0,120	0,276
50 x 50 x 50	0,125	0,288
∅50x50	0,098	0,226
∅50x30	0,058	0,134

Funnels for precise casting

They are made of refractory concrete developed specifically for contact with Al melt and resistant to thermal shock. They are used for shell mould casting.

Standard funnels please see the table below; customized funnels can also be made.



Funnel 1	
Funnel 2	

Melting and holding furnaces

The following furnaces represent another range of furnaces for melting and holding of aluminium alloys that are known thanks to their energy savings and design technology:

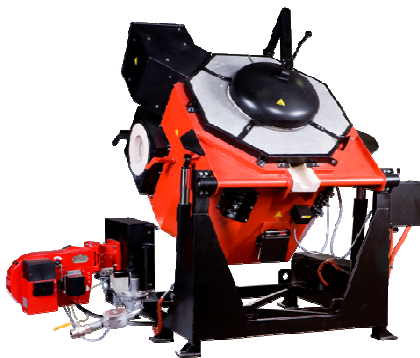
- Melting electric resistance stationary furnaces – PT
- Electric resistance tilting furnaces – PTS
- Gas stationary melting furnaces – PTP
- Gas tilting furnaces – PTSP

The mentioned furnaces are also classified as the top in Al alloy melting and holding. The furnaces have ideal lining => low power input, low power consumption. Up to 30% savings are achieved when compared with the former fireclay furnace.

All the mentioned furnaces can be fitted with the automatic cover that ensures minimum radiation heat losses from the charging opening with the cover open, which can reduce power consumption by up to 50%.

For more detailed information, please see the industrial catalogue.

If you are interested in similar furnaces, please do not hesitate to contact us. We will carry out precise measuring of your existing furnaces and offer you a solution how to save energy with pleasure. Naturally, we guarantee return of the offered investment.



PTSP combustion fumes exhaustion through chimney outlet



Melting electric resistance stationary furnaces – PT

Furnaces for aluminium thermal processing

The furnaces for aluminium thermal processing and hardening containers represent another range of products. They are furnaces for versatile application (drying, vulcanization, pre-heating and hardening, surface layer drying and hardening, tempering, artificial aging, pre-heating, etc.)

Furnaces suitable for aluminium thermal processing:

- Dryers – S
- Driers – SV
- Car-type chamber dryers – SVK
- Tempering furnaces – PP
- Horizontal chamber furnaces – KNC/H
- Vertical chamber furnaces – KNC/H
- Car-type chamber furnaces – VKNC

Attachments for aluminium thermal processing:

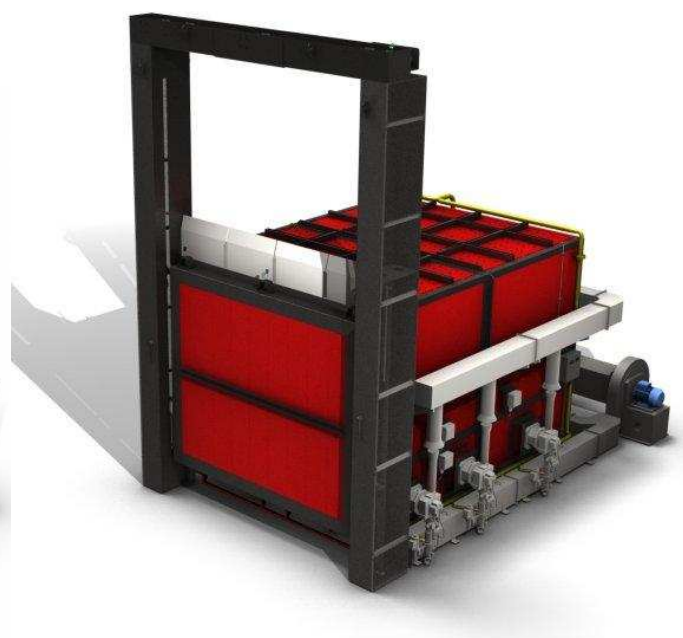
- Hardening bath
- Hardening container

For more detailed information, please see the industrial catalogue or ask as for its sending.

If you are interested in similar furnaces, please do not hesitate to contact us. We will carry out precise measuring of your existing furnaces and offer you a solution how to save energy with pleasure. Naturally, we guarantee return of the offered investment.



KNCV 1000



VKTP 2000

Crucible tongs

They are used for crucible pulling by outer perimeter.

Type	Minimum crucible diameter [mm]	Maximum crucible diameter [mm]	Tongs load bearing capacity [kg]
LAC tongs 1	380	600	150
LAC tongs 2	580	740	250
LAC tongs 3	720	840	350
LAC tongs 4	820	950	700
LAC tongs 5	940	1070	700



Auxiliary services and products

Reconstructions of furnaces and dryers

We offer execution of reconstructions of furnaces and dryers of both domestic and foreign manufacture.

Executed reconstructions:

- Linings of all types of furnaces
- Furnace cars for all industry branches
- Heating systems
- Insulations
- Control systems
- Regulation systems and switchboards
- Ventilator units

Heating cartridges and elements

We produce heating coils for all types of furnaces. Possibility of supply of heating coils including installations. Upon request, we can produce even bodies with specific parameters.

Refractory concrete and fire-resistant shaped pieces

We supply boards and shaped pieces made of refractory concrete resistant to Al melt.

We also produce pan outlet stones, pan lining shaped pieces, dome furnace shaped pieces, channels and troughs for electric induction furnaces, furnace and ladle covers, walking-beam furnace hearth shaped pieces, pan drop boards, special shaped pieces, funnels and tubes, scum baffles in contact with molten metal, suspended shaped pieces for zinc-coating furnaces.



Průmyslové pece a sušárny – žárobetonové tvarovky | Industrial furnaces and dryers – refractory castable shapes



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