N.G.T.I. Freilingerstr. 19, A-4614 Marchtrenk

Nächste Generation Thermoprozesstechnik
Industrieofensysteme GmbH

Tel/Fax +43 (0) 7243 500 66
Mobil +43 (0) 664 590 60 54
Mobil +43 (0) 664 912 69 23

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Hr. Bartl/hb +43 (0) 664 590 60 54
Hr. Haider +43 (0) 664 912 69 23

Quantum jump in the extrusion die preheating technology
Project: Aluminium extrusion dies / fast preheating

Furnace systems for extrusion dies

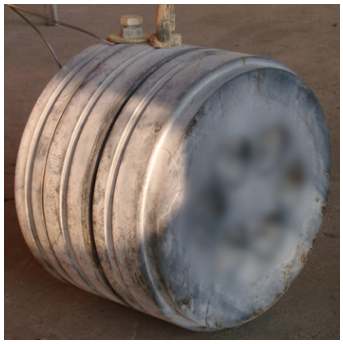
A furnace system for extrusion dies – for the fastest preheating of dies
ACC_CONforce plus / **Quicktherm plus**

THE RESULT

New generation of extrusion die furnaces
During the last few months we have developed a new heating concept.
Based on the available technological knowledge and with a view to the market demands, a new heating concept with extreme short heating up cycles has been developed.

Savings on 75 % up to 66 % on heating up time
As a result out of the furnace development and the new generated concept, the heating up time has been reduced by one quarter up to n one third of the time needed on standard die furnaces. Despite a heating time reduction down to 75 % or 66 %, the die is heated up uniform on the surface and no overheating occurs on exposed areas.

Fig 1
Extrusion die: diam 340 x 220 mm



Example (Fig. 1)
For example, the extrusion die shown in Fig.1, which is 340 mm in the diameter and 220 mm thick (weight 160 kg), needs a heating time of only 30 to 45 minutes to be heated through to the core from 25 °C to 460 °C.
The die then is already heated through and prepared for installation on the press unit. (Fig. 2)

Temperature characteristics are shown in Fig 2.

If the die has to stay longer in the furnace, this holding period does not result in an partial, overheating

Further possibilities
When the heating starts at higher temperatures then 25 °, so for example 200 °C or even higher, the mentioned heating up times are even shorter, by about 10 minutes. Thus, under such conditions, the heating time can even be as short as 20 to 25 minutes.

Testing furnace and calculation models
The above mentioned data for the shortening of the relative heating times and absolute heating times in minutes can not be directly and linearly extended to any of the die geometries. We use test furnaces and calculation models which allow in advance a very accurate determining of the important information.

At that situation, all the important variables of the heating task (die geometry, starting temperature, final temperature, etc) can be computed in advance and modeled direct into the furnace.

The time information can be tested in the required test furnace under original conditions. Information on the available test furnace: net chamber L / W / H: 500 / 500 / 500 mm which means that dies with a diameter of 500 and 500 mm thickness can be handled and preheated.

Industrial design /repeatability
On the new generation of the furnace all considerations have been taken into account to the industrial design, repeatability of all result and especially for the process stability

Outlook
As information:
If one user needs even shorter times, this too can be planned, tested and achieved.

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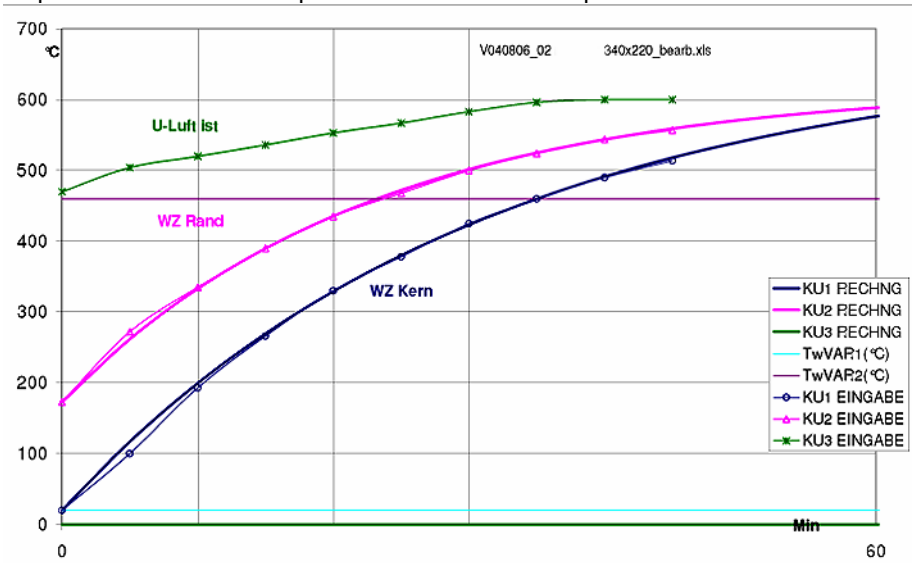
Fig. 2 Extrusion die: diam 340 x 220 mm
Core temperature / surface temperature / forced air temperature



Standard die preheating furnaces
We would like to explicit express, that the mentioned preheating technology can also be used for standard preheating processes where still furnace clusters are used. It will result in savings on pieces of furnaces, energy, hall area, maintenance etc.

Inert gas atmosphere
Based on the shortened stay of the die in the furnace one has to discuss the demand of an ambient inert gas atmosphere. Due to the short heating time – in most cases - a special inert gas flushing of the furnace is not required.

Surface of the extrusion die
In this type of preheating, no part (even exposed parts) of the surface is overheated. The temperature of the nitrided die surface layer also does not rise above the permitted limit, and the maximum heating duration is not exceeded.

ACC_CON Technology – Application of heating energy
Heating takes place by a modified, convective form of an impact air flow, which, by accelerating the heating gas stream, activates the extremely high heat transfer potential. The overall configuration of the heating gas cycle (heating – high speed hot gas turbine – energy transfer to the work piece) is called as **ACC_CON Technology.** The name is a combination of the abbreviations **ACC**elerated **CON**vection.

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THE FURNACE
ACC_CONforce plus / Quicktherm plus

Information on the furnace (Fig 3)

Test furnace	available
Kind	**ACC_CONforce plus / Quicktherm plus**
Type	SCHA.VORW.0002.0700
Net chamber	max. 500 / 500 / 500 mm, for a max. die diameter of 500 mm x 500 mm thickness
Heating power	app. 40 kW electric
Forces air	Good designed
Fan drive	Good designed
Chamber	Without inert gas / N_2
Loading	Top loading with lid
Dimensions	L/W/H: 1.700 x 1.700 x 2.100 mm
Weight	App. 1. 900 kg
Info:	All specifications and design requirements can be adjusted and modified to the customers need. (Loading, lid, handling, etc.)

Fig 3 Type ACC_CONforce plus / SCHA.VORW.0002.0700

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