EXTRUSION NEWS 2006-01:
ISOTHERMAL EXTRUSION SYSTEM I.E.S.

ISOTHERMAL EXTRUSION: THEORY BECOMES REALITY

The isothermal extrusion system IES, which is a development of the Italian company SAI Automation, is the result of more than 26 years of working experience in the field of aluminium extrusion. Tecalex is exclusive engineering partner for IES in Spain.

Through the years IES has become a powerful tool able to increase production by over 10% in standard situations and to adopt brilliant solutions for billet temperature control during extrusion, even with difficult dies.

Fig.1: Control system screen

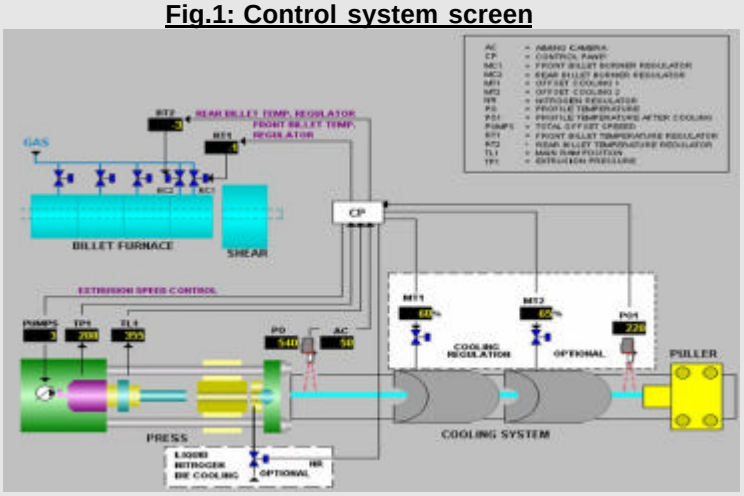

Fig. 2: Central control panel

By means of special sensors, the IES system collects data: extrusion pressure, main ram position, set of temperature profile and die change signal. After analysing and processing the parameters IES offers two main correction signals: one for extrusion speed and one for the set point of billet temperature outside the furnace.

For taper-heating furnace, IES processes two correction signals for billet temperature: one for the front and one for the rear.

The correction range of these signals varies from -30 to +30 ºC for billet temperature and by +/- 20% for extrusion speed.

Ingenious software devices keep the whole extrusion process steady, ignoring anomalous parameters in case of discontinuous production. In addition IES allows 4 different working processes:

1. Billet temperature control
2. Dynamic extrusion speed control
3. Step speed control (billet by billet)
4. Automatic (controlling all processes)

In this way, the operator can choose how to manage an extrusion in order to better exploit the press force.

An optional function controls the flux of liquid nitrogen for die cooling. This function has been tested on an existing extrusion plant and gives excellent results: the combined use of IES isothermal extrusion and of the flux control of liquid nitrogen increases speed by 30% decreases sensibly the use of nitrogen compared to traditional systems, and increases die life by 20%.

Another optional function is profile cooling control outside the press. By means of a special sensor reading the profile temperature from 90 ºC, IES controls the cooling process in order to obtain constant difference between the profile temperature outside the press and outside cooling, which makes it possible to increase speed and to improve product quality. The IES kit includes: pressure and position transducers, a control panel, and a camera with a self aiming system.

Tecalex, as a turn-key producer of billet heating and intensive profile cooling systems is able to define integrated solutions for the individual case.

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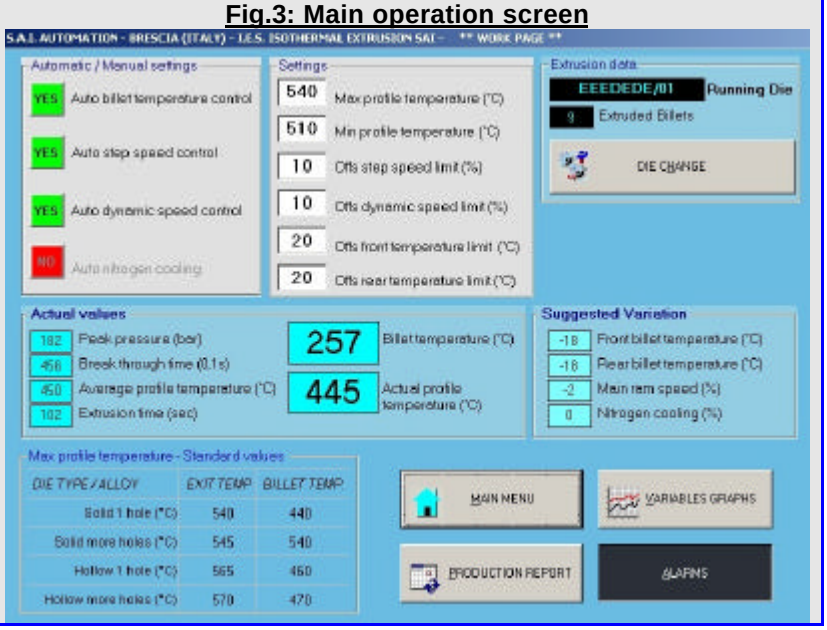
The IES kit includes: pressure and position transducers, a control panel, and a camera (for profile temperature) with a self aiming system.

It is essential to rely on perfect self aiming to assure efficiency and precision in the production process. IES places the camera in the ideal reading position (a page for manual positioning is provided in the advanced system version). The optical head is featured in order to read the temperature on bright surfaces like aluminium.

IES reads the infrared emissions with two wavelengths. The temperature profile can be read even it the observed surface is not regular or not orthogonal.

Fig.3: Main operation screen



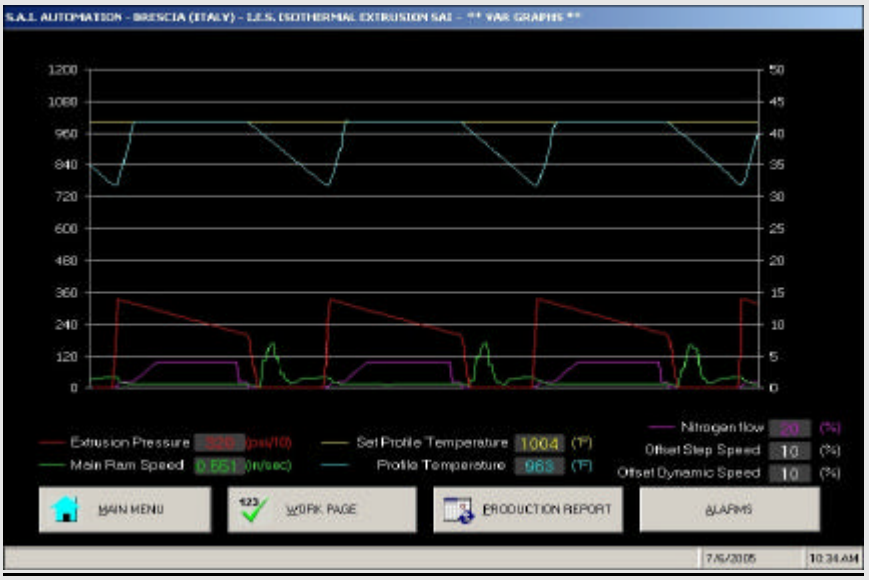
The control panel is a small box with PLC and PC + touch panel placed near to the press operator. Various working screens (e.g. fig 3 and 4) can be used out of the control software, included in the system. The control parameters of every individual die (fig. 3) are saved to a database and can be uploaded every time when working with this die.

Fig. 4 shows a diagram of real values (variables), which are important for the extrusion process and for the correction applied by the IES system.

The installation of the system in an existing extrusion plant is fast, without stopping the production. Two specialized technicians will work during 3-4 days for the implementation of the system.

Installation is possible in all kind of extrusion presses with hydraulics based on variable pump flow.

Fig.4: Working diagrams



The IES system works in parallel to the already existing control unit of the press. This means that the original configuration of the press PLC and control system will not be touched.

IES achieves and preserves steady product quality and increases production. The results are confirmed by a lot of installations all over the world.

If you want to examine the option to install an ISE system in your factory or if you have to carry out modifications or repairs, Tecalex is your reliable partner. All works are done, based on up-to-date technology, in order to provide maximum performance.	Please do not hesitate to call your Area Manager or the Newsletter product manager: **Jürgen Sturm, +34 670 34 86 79** We are looking for your call!

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