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Kurtz ...NEWS

The customer and employee journal

Kurtz
- a Long History

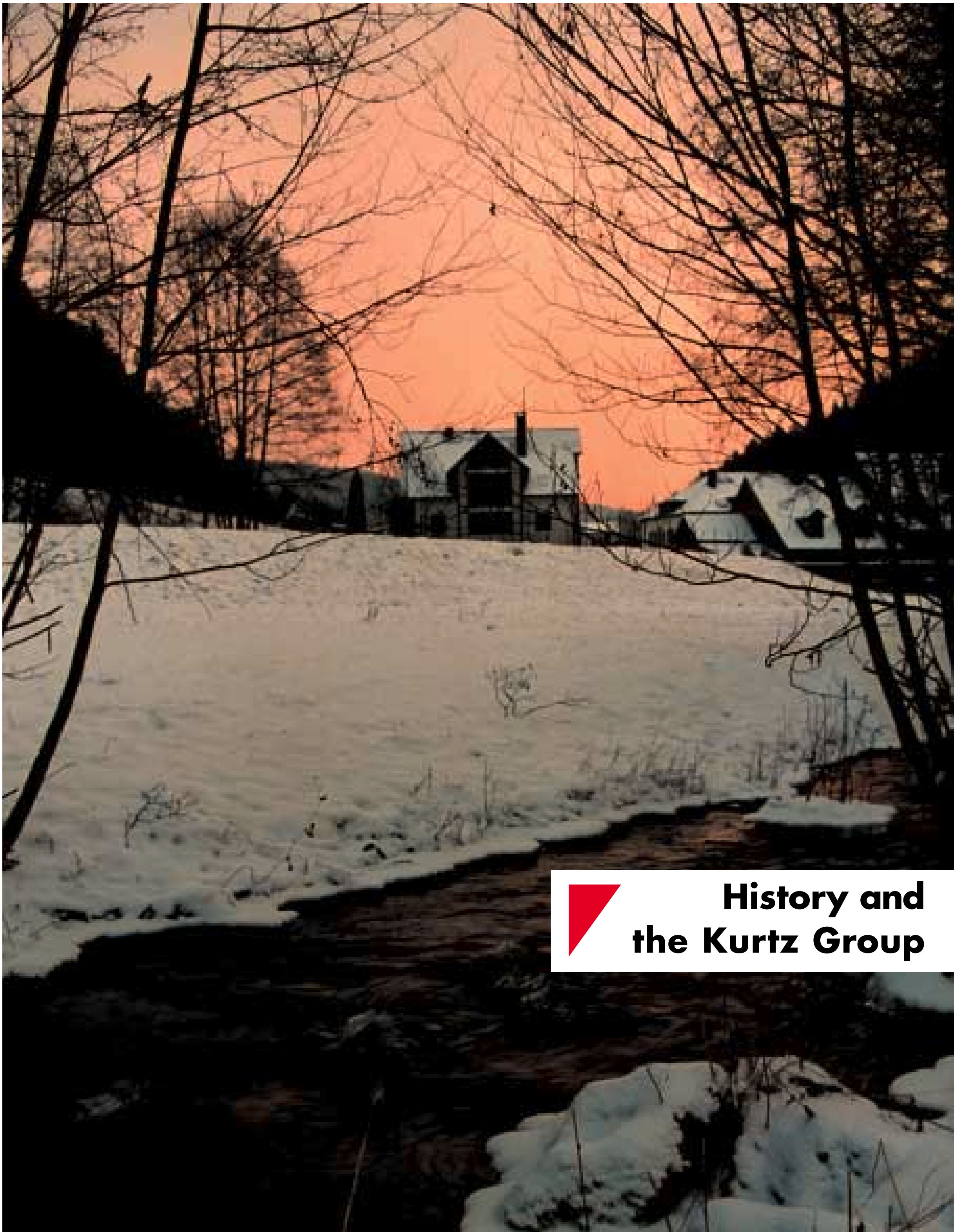
Good Times,
Bad Times

The History
of Iron

ERSA & Soldering

Moulded
Easter Bunnies

Otti - Granolator



History and
the Kurtz Group

http://
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The Roots ...

CONTENT

At the end of March this year, shortly after the company's senior director, Mr Dipl.-Kfm. Otto Kurtz - in the best of health as ever - celebrated his 86th birthday, our company reached its 220th. As we approach the end of the year 1999, this fact is in itself reason enough to take a look at our history.

In past years we have worked hard on our company structure, with the aim of maintaining a unified company culture. But on the other hand we have been careful not to force individual companies in our group to break with their own history, thus enabling each company to preserve its own identity. As someone once said , 'Only he who knows where he has come from, can also know where he wants to get to'. This is the reason why we spare time to remember the past, to think about our history and to learn from it.

Kurtz NEWS 16 is, so to speak, the most up-to-date reference work on our multi-facetted company history. Almost all the branches of our business have their own technology history.

One part of this technical history is associated with the company's respective business field and another part is intimately linked with the Kurtz group. It is the variety of business fields within the group which makes this such a fascinating topic.

We are very glad that the staff members of the Kurtz group also show interest in historical developments, in the evolution of job profiles and in the question of how this will affect the future. The best example is provided by a former staff member and amateur numismatist, Mr Philipp Hügel, who has made us a drawing of a Wertheim florin. It is not impossible that very florin was used in 1800 by Kurtz's founder generation to buy the Hasloch forge, built twenty years earlier.

Kurtz NEWS 16 will surely make an interesting read for the quieter days between Christmas and New Year. We wish you all, our customers, our staff and our staff's families, every good thing, health and success for the last few days of 1999 and throughout the coming year.

Good Luck!

Kurtz - a long history ...

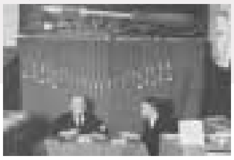
The history of the various firms within the Kurtz Group is a long one - its beginnings go back to 1779 - and one which reflects Germany's own technological development. It is not only a practical example of how a middle-sized enterprise located in Germany has developed and diversified, but also a demonstration of how a company can preserve tradition and yet remain modern and innovative.

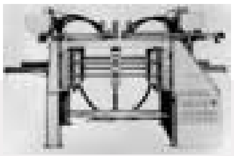
1779
Hammer mill

1852
Iron foundry

1860
Machine factory

1921 *Ernst Sachs registers his patent for electr. soldering*





1971
First shape moulding machine

It all began with a water-driven hammer mill taking in scrap iron that the workmen from the neighbouring villages brought in to be reprocessed. The scrap iron was melted down in the muffle furnace and forged under the big forging hammer, after which various articles for daily use were then produced with various other smaller hammers.

The Kurtz family took the hammer mill over in 1800. The Kurtz's can be traced back in church documents to the end of the Thirty Years' War in 1648 and since that time had constantly been smiths, active as craftsmen in the forge. This can justly be called a close attachment to the trade.

In 1844 the Kurtz brothers were the first smiths in the kingdom of Bavaria to produce axles for vehicles with iron-clad wheels. Until then every single axle had been imported from England. This gave the steam hammer mill a reputation beyond the bounds of the immediate neighbourhood.

In the year 1852 a foundry for grey cast iron was built on, in order to make the production of axles more efficient. And shortly afterwards this was followed by the opening of a machine factory.

At first the company concentrated on the jobs which were nearest to hand, namely the production and repair of water-wheels, which also formed part of the company's own plant, and the construction of mill installations. If the workforce was not stretched to capacity, then there was always maintenance work to be done on the company's own plant.

The year 1900 saw the installation of electric light in the works. The electricity was produced with turbines, the successors of which are still in operation. The firm Siemens-Schuckert from Nuremberg carried out the installation and was paid in kind with deliveries of castings, an early example of the barter economy. It is perhaps worth mentioning that the coming year will see the 100th anniversary of business relations between our two companies - a prime example of long-standing supplier-customer collaboration!
In 1921, on July 7th to be absolutely accurate, Ernst Sachs registered his patent for electric soldering, a date which began a new era in soldering technology. Production started in Berlin, and after the war, when the business had to leave Berlin, a new start was made in a small workshop in Wertheim am Main.

It has certainly not escaped your attention that no mention has been made of the evil chapters of German history that clouded this period. It must however be said that the works in Hasloch were too insignificant to be employed in the armaments industry or in any other sector. Naturally, many men from the staff were recruited for the war and a number died on active service.

In 1951 Dipl-Ing. Franz Wieser started the production of compressors for refrigerators at Altaussee in Austria. Not many years later a reactor plant was installed producing EPS to be used as an insulation material for refrigerators. EPS was also produced for the open market, as were machines for EPS-processing.

In 1961 ERSA moved to new premises and at the same time presented the first soldering machines on the German market. At about the same time a new foundry was built in several stages in Hasloch. The capacity was set at 3000 metric tons of high-quality casting.

… for more than 220 years …

The machine construction section at Kurtz was also expanded, and a busy period of development started in all sectors. ERSA became a co-founder of the Productronica in Munich, which now leads the field in soldering technology exhibitions

The first slowing up of development after the German economic miracle of the post-war years took place at the end of 1973/74, as a result of the so-called oil crisis. It was clear that people were beginning to think differently and for the first time we heard such expressions as humanisation of the workplace, nuclear power emissions protection, emancipation, quality of life, workers' participation in decision-making, the speed of light, smog, terrorism, and conservation of the environment. This clearly marked the beginning of changes in the political landscape.

In 1982 Kurtz acquired the site of today's works in Wiebelbach, along with the aluminium die foundry which was already there.
At the same time a number of employees of the firm Wieser at Altaussee in Austria bought out the management - one of the first management buy-outs - and this resulted in a number of interesting new fresh impetus in the field of machine technology. It was at Altaussee that the first vacuum blockmould was built.

In 1984, by way of giving the finishing touch to the foundry programme, Kurtz acquired the Weiland Werke in Mannheim - that produces both as a continuous and centrifugal casting foundry and as a die and sand casting foundry for nonferous heavy metal and aluminium alloys. The same year saw the foundation of Kurtz Far East, a marketing office for Kurtz products in the Asian sector, with its headquarters in Hong Kong.

In 1985 Kurtz founded its first overseas branch, Kurtz North America.

1990 saw the incorporation of Wieser Maschinenbau into the Kurtz Group, and the foundation of Kurtz France a nd Kurtz Italy with the aim of exploiting those respective markets more efficiently.

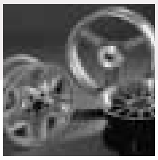
Together with the production site at Altaussee and the servicing branches, Kurtz had now built up its complete particle foam processing programme, with the most highly developed sales network in the sector at its disposal. Kurtz had become the leader of the worldwide particle foam materials market and after only a year they were able to present the new processing technology known as LTH.

On January 1st 1993 ERSA became a member of the Kurtz Group. The decision to buy ERSA was a strategic one taken by the Kurtz family to secure a leg to stand on in the growing market of the electronics industry.

In 1996 MBW Metallbearbeitung Wertheim GmbH was created out of the former sheet metal processing and assembly section of ERSA. The success of this breakaway was such that in 1999 it was already possible to buy up a second operational base for the company near Nuremberg.

At the beginning of this year a new organisational structure was presented with Kurtz Holding acting as the central server for all the enterprises included in the Kurtz Group. 1999 also saw a thorough reorganisation of the granulator plants sector. Products, production, organisation and sales were all modified in order to bring this business sector into perfect tune with customer requirements.

Looking back over the years, one can clearly see how all the business decisions taken fit neatly together to form a satisfyingly rounded overall picture. Especially in difficult economic times it is particularly important to diversify and not to put all one's eggs in one basket. That way it is possible to neutralise the effects of economic ups and downs in the various markets.



1982
Aluminium foundry

1984
MGM metal foundry

1985
Kurtz USA

1990 *Particle foam machines in Altaussee*

1993
ERSA soldering technology

... and no end in sight!

With such a variety of products Kurtz has a great depth of know-how at its disposal, know-how that can be put to good use in development, design, production and marketing. When this potential is used as efficiently as possible, then Kurtz only stands to occupy an even more advantageous position in the competitive market.

In this coming year, the year 2000, it is our intention to keep up our tradition and to consolidate what has been handed down to us. And furthermore to expand our activities so that we too will be in a position to hand a thriving business down to those who follow in our footsteps.

1996
MBW Sheet metal technology

***1998** Kurtz Holding and administration building*

2000

In-house fair with enormous attendance

Almost 700 persons visited the KURTZ GmbH in-house fair in Wiebelbach from 11th-13th Nov. 1999. The customers came from 39 different countries from all over the world in order to bring themselves up to date on the most recent developments and applications in the particle foam materials industry.

In an exhibition space of about 1000 m^2, they were able to convince themselves of the performance levels and high degree of automation of the machines currently in operation at KURTZ.

The ability of our development team to provide flexible tailor-made solutions for our customers was demonstrated using the special machines K1015 for the production of skin-moulded fish boxes and K138R for the production of building elements with inserts.

Further exhibits included the energy-saving LTH shape moulding machine, a shape moulding machine for the production of EPP mouldings, a pre-expander designed for the use in a laboratory, a batch pre-expander, the test stand pre-expander for the processing of different types of materials, and a mini-recycling plant.

During the in-house fair the visitors were not only able to examine the machines, they also had the opportunity to participate in lectures held parallel to the exhibition gaining information about pre-expansion, block moulding, cutting, peripheral cutting technology, EPP and the automotive industry, where costs are created in the processing of particle foam materials and plant layout. Furthermore plant tours enabled our visitors to gain an overview of the high-quality production and assembly facilities with KURTZ.

For the first time not only the division for the production of machines for the processing of particle foam materials participated - the other divisions of the Kurtz Group took part in the exhibition as well. The supply sector presented a selection of steel sheet constructions and castings. The foundry machine divison showed three aluminium die casting machines. The division for granulators exhibited an auxiliary granulator for different applications. Also the soldering divison ERSA was presented supplementing the in-house fair by showing an conventional soldering system which was also on show at the fair 'Productronica' taking place at the same time.

For all the importance of the specialist events, it was not intended that we should cut back on the social side, and there was an event on every evening the in-house fair was running.

No-one would dispute that the highlight in the programme was the Gala evening in the old monastery walls at Bronnbach.

Aluminium, the metal made from clay - From foundryman for foundrymen

Once known as 'silver made from clay', aluminium is a very young metal. With a density of 2.7g/cm^3 it belongs to the family of 'light metals' and is now one of the most important metals in everyday use.

Unlimited reserves

Aluminium accounts for 7.5% of the earth's crust by mass, and is thus the most common metal on the planet.
The base material for the production of aluminium is bauxite, which consists half of alumina and half of aqueous aluminium oxide. In the alumina factory, the alumina is chemically purified of silica, iron and titanium oxide and its water content is removed in calcining furnaces. The end product, calcinated alumina, is a dry, white powder, which is then heated to 900-1000°C together with cryolite (Na_3Al_6), in the process of which the metallic aluminium is separated off by electrolysis in the dry way.

Aluminium was first produced chemically by the Frenchman Sainte-Claire Deville, and a kilo of aluminium was presented to the public as a 'miracle of modern science' at the Paris World Exhibition of May 1855.

Napoleon III was so delighted by this discovery that the first utensil to be manufactured in aluminium was a finely finished and chiselled rattle for his little son. The price was considerable, as a kilo of aluminium at that time cost around DM 1,000.00 Five times the price of silver! The price of aluminium did however fall quite swiftly, and in 1884 it was around DM 100.00 per kilo. Only when aluminium began to be produced by electrolysis did it become an everyday metal. In 1886 electrolysis in the dry way was introduced as a means of extracting aluminium, and by 1897 the price for a kilo of aluminium fell to DM 2.50. Once this was the case, nothing could get in the way of the silvery metal's triumphal march into the new century.
It was however only with the production of alloys that aluminium was used to best effect in the technology of the time. Aluminium's most important alloying additions are silicon, copper, zinc and manganes, followed by titanic iron, nickel, chrome; less frequently, alloys are made with lead, boron, cadmium, bismuth and zircon. A distinction is made between forging and casting alloys. The wrought alloys are suitable for non-cutting shaping methods such as rolling, forging and extrusion presses.

For casting in moulds, casting alloys are used. The criteria which determine the choice of alloy to be used are strength and corrosion resistance values, and casting and solidification qualities.

Fig.: Tiltable casting machine AK 01

The path that has taken aluminium from the 'miracle of modern science' of 1855 to today's multi-purpose material for a huge range of everyday goods, is a path which has by no means yet come to an end. All over the world work is continuing on the perfection and further development of alloys.

For KURTZ, aluminium is in a number of respects a material of great significance. KURTZ sand-casts aluminium at MGM in Mannheim and die-casts aluminium - using the gravity, tilt-pouring and low pressure methods - at the Kreuzwertheim-Wiebelbach aluminium foundry.
Between them, these two foundries have an casting output of approx. 700 metric tons per annum and are constantly involved in finding new areas for the use of aluminium castings.

Since 1982 KURTZ has been active in the field of machine development for die casting. At first this was for the company's own foundries, but since 1989 KURTZ has constantly been committed to building up this activity into a sector in its own right. At KURTZ the foundry machine construction sector is concerned with all the technology involved in smelting, temperature maintenance, dosing, mould-filling and mould-handling for casting light metals.

The experience gained in the company's own foundries is combined with that of the foundry machine construction sector's customers, with the result that it is constantly possible to develop fresh approaches and new varieties of soundly practical solutions in the field of light metal casting.
The market of the future will promises to provide 'silver made from clay' with many new areas of application. Prospects are looking good!

Solidification simulation for castings

Today's fast-moving market calls for castings in an ever greater degree of geometric complication. This in its turn calls for greater casting technology know-how from the foundries. At the same time the market life expectancy of individual

Fig. 1:
Alu-wheel geometry - 3-D model

products is getting shorter, with the result that we have now come to take short product development times for granted as a normal feature of our working life.

No time is left over these days for trial runs, as these can be a drain on the time and money available. So dies (moulds) have to be designed and built which are guaranteed to provide a high degree of casting accuracy right from the word 'go'.

A useful aid in this respect is computer-aided solidification process simulation. The aim of this numeric simulation is to develop functionally and dimensionally correct construction and casting processes on the computer, thus saving on trial runs. In this way it is possible to economise on resources, cut development and process times, and raise quality levels.

In this case 'simulation' means the creation of a physical-mathematical model in the computer which reproduces the actual installation - the casting system in its entirety, that is to say the model or die with gating system and feeder - as accurately as possible. Process simulation makes it possible for the process sequences to be defined, controlled, measured and represented as if in three dimensions on the computer. By varying the individual parameters for the simulation of the process, it is possible for interdependencies, influences and changes in the sequences to be seen clearly, assessed and utilised.

The computer simulation makes it possible for casting and solidification processes to be predicted on the computer, a procedure known as 'cold casting'. For a genuine calculation to be carried out, as many parameters as possible have to be defined and incorporated.
The procedure to be followed sounds very simple!

First the part to be cast must be modelled, complete and in three dimensions. Then:

- the die has to be designed as accurately as possible
- the gating system, with its runner and open feeders, is defined in accordance with data from previous castings and integrated into the numeric model
- the metal temperature, the die's start temperature, the mould-filling times, the pressure time, solidification times (these constituting the casting parameters) and the handling time are stored, and the calculation is started.

After 10, 15 or 20 calculation runs, the results on the screen are assessed and analysed. If necessary, a number of optimisation calculations are carried out, until the ideal process has been found.

It all sounds very simple. In reality however, the operator has to have a very high degree of experience and knowledge of casting technology.

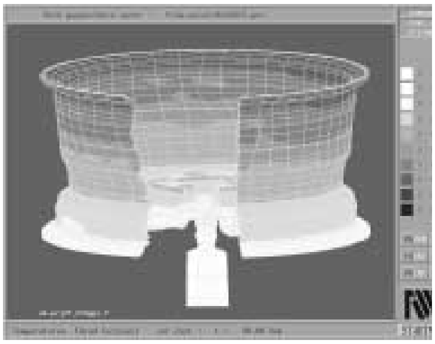


Fig. 2:
Filled wheel

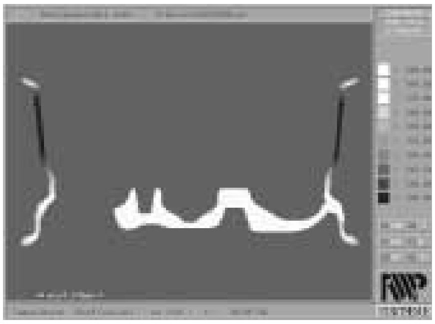


Fig. 3:
Solidification has begun. There is a clear problem area on the upper edge of the wheel rim.

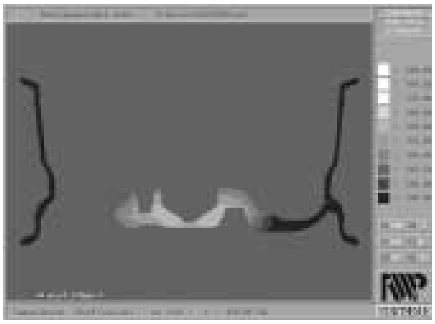
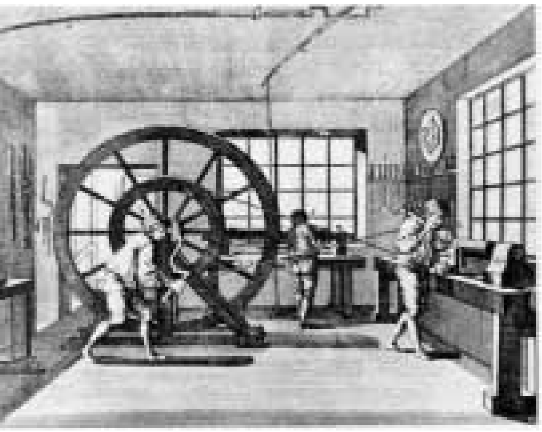


Fig. 4:
The solidification of the wheel is almost completed.

Good times, bad times

The past ... shapes the future We still have good memories of the times when raw materials were brought to the sawmill with the handcart, when the driller set his dimensions with a hand crank, and when the turner's heart still leapt if his lathe was fitted out with a copying device. In those days he still forged his own turning chisel in the coal fire, tempering and sharpening it by hand, and it was considered a boon that working plans could be copied with relative ease by means of matrices in the work preparation phase.



However, the day finally came when the production economy was overtaken by microprocessors. Microelectronics became part and parcel of all our machines. CNC-controlled machines help us to achieve and to perfect an ever greater degree of flexibility and economic efficiency.
KURTZ machine construction works in close contact with the best-known tool and machine producers both at home and abroad and has the most suitable tool and machining technology constantly at its fingertips.

Total machining in one

With the help of high accuracy carbide indexable insert cutting tools, workpieces are not only turned, but also drilled and milled in one cycle, often only needing to be set up once. Modern rod-loading magazines, automatic cutting power measurement, integrated measurement control, tool correction with automatic tool replacement, collision prevention by programmable safety areas, graphic and dynamic process simulation are all elements of the state-of-the-art technology in this field. All these factors contribute to the rationalisation of production while maintaining the highest degree of accuracy in the finished workpieces.

Fig.: Turning technology

Sawmills

With the CNC special bevelling bandsaw with automatic feeder, an industrial PC and Siemens PLC-controls, the cutting speed is calculated automatically. Adjustments are made accordingly and a check is subsequently kept on the speed, all on the basis of the chosen working material, its shape and its size. A feature which makes the procedure and its planning much easier is a storage space administration facility, which immediately registers the items that are put into and taken out of a modern rod store.

NC tool production machines and data transfer

After years of machining by hand the first step towards CNC-programming was made with punched paper tape. Nowadays tool information is produced at the pre-setting stage of tool production provided by form and stored in the server. The information is then transferred in one go to the machine via the DNC-network with NC programmes set up externally.

Organisation and parts management

Special data-processing programmes facilitate an arrangement tailored to the job in hand, the production of assembly and truing lists, and lists of missing parts to help meet deadlines. When it comes to later orders for spare parts, complete records of all internally produced parts and assembly construction groups make the necessary calculations and searching easier. Computer-controlled storage of bought parts make short storage and access times possible, as well as improving the protection of the stored goods in a limited space.

KURTZ machine construction is fully aware of its vital significance in the market area of machining. This brings benefits both to the company and to the employees and customers.

Fig.: DNC data transfer

Sheet metal machining through the ages

Man was at first slow in developing techniques for working sheet metal. The earliest metalworking can possibly be dated as far back as the 11th century B.C. In those days this consisted in hammering small lumps of local copper into pieces of jewellery. In his own day, Leonardo da Vinci made the first designs for rolling strips of sheet metal. Many stages were necessary before man was able to produce

Fig.: Rolling mill of Leonardo da Vinci

today's sheet metal, which is manufactured by cold and warm rolling techniques.

The metal sheets were for a long time worked on by hand, but the purely manual method was at first complemented in the course of time by mechanical devices such as scissors, punches and bending machines, and then quite literally revolutionized by the application of CNC technology. The introduction of modern CNC-controlled sheet metal working centres and not least the use of the kind of laser technology that has been employed by MBW Metallbearbeitung Wertheim GmbH, are leading to further transformations in the application processes.

If the advantages of the new technologies are to be used rationally, all the parts of the whole sheet metal production procedure must be linked up as efficiently as possible.
This has a significant effect on the three areas of design, programming and production. Designing complex bending parts is a great challenge and requires good knowledge of material, tool and machine data. By using 3D CAD systems it is possible to test the practicability of certain processes, notably bending processes, in advance. The automatic generation of the whole process, that is to say the transformation into a two-dimensional drawing, offers the programmer the best possible basis for the production of the NC-programme.

The programming is applied to the processing of the sheets and the bending operation. By using intelligent programming systems the machine technology is used to best effect and account is taken of the technical requirements of the materials to be processed. If, for example, high-grade steel sheets are to be processed with a laser-cutter, then other machining parameters will be required, for instance for the laser power, the speeds and the cutting gas.

The production of the work pieces begins with the cutting of the sheets, or flat machining. If features such as for instance ventilation gills and embossings are required, this means that workpieces of this sort are punched, as this is in any

Fig.: Modern sheet metal parts

case possible without any problem on the machine in the course of the cutting. But if clean edges without any distortion whatsoever are required, then practically the only solution is to perform the cutting on the laser processor.

Good bending machines allow for all the bending operations to be carried out without the workpiece being taken off the machine. By means of simulation of the bending sequence this can be checked out at the programming stage.
After bending has been completed, production continues with the assembly of the construction parts, using, for instance, welding, riveting and screws. Which method is to be used will already have been determined by the designer according to the expense involved.

The aim is always to reach the final form in as few steps as possible. The construction design of workpieces is thus of the highest importance for cost-effective production.

The staff of MBW Metallbearbeitung Wertheim GmbH are glad to be of assistance to you in meeting the challenges facing you in the field of sheet metal technology.Direct contact with the qualified sheet metal machiner offers the best chance of success.

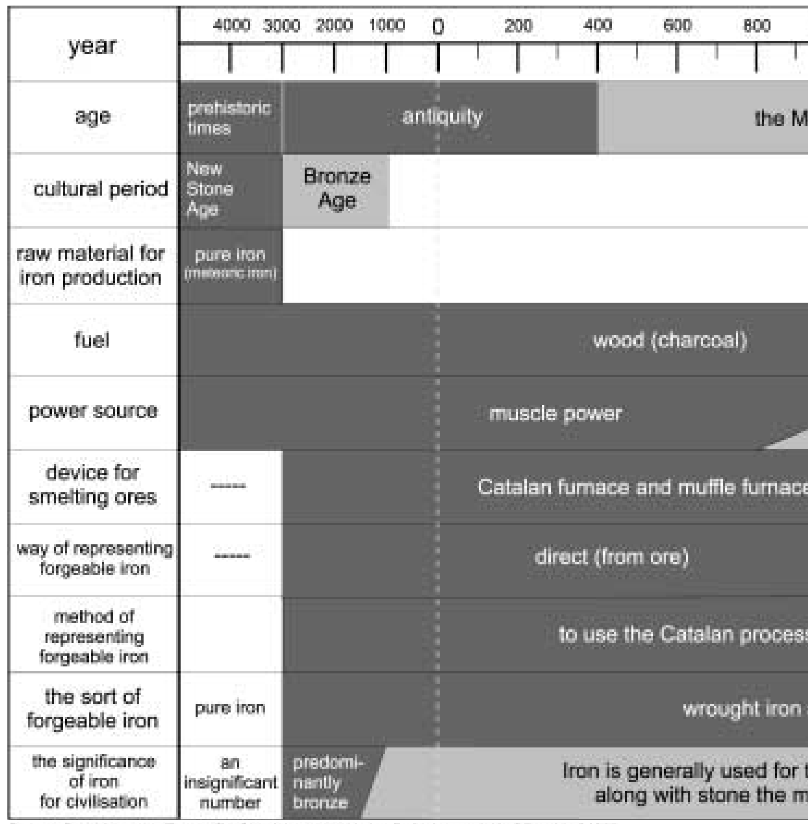
The history of iron

Iron was not man's most important working material in prehistoric times. Nor was it, either at the dawn of history, nor in antiquity. Iron does not feature at the outset of human culture, but first appears among the ancient peoples at the beginning of historical time. In the so-called Early Stone Age, which began hundreds of thousands of years ago, man used tools and hunting weapons made of stone or of materials taken from plants and animals. At the starting point of every human culture we see, in addition to the use of tools, the knowledge of fire, which is indeed a basic condition for the practice of open-cast mining and metallurgical endeavours.

An important preparatory stage to the extraction and processing of metal was the invention of pottery, based on the principle that soft wet clay hardens when heated. It is clear that the potter's wheel was already used in Egypt in pre-dynastic times. Even the production of glazes and the manufacture of glass that derived from it were known to mankind earlier than the extraction of metals from ores. In the Egyptian language both glass and faïence are known as 'Libyan' (thn) because they were first produced in Libya, that is to say in the Nile's west delta.

Developments in metallurgy run parallel to the electromotive series of metals, going from the precious metals to copper, tin, lead, iron, zinc through to the light metals. The first metal that man got to know was gold, which he found in the pure state, and whose lustrous beauty enchanted his childlike spirit. To begin all that man could do was to mould or forge largish lumps of gold cold; it must have been some time before he learnt the art of melting down gold dust.

Even then it can only have been many generations later that he mastered the art of casting, first of all in open moulds, then in closed moulds, and finally in permanent moulds. Iron is also found not only as an ore but pure. It is true that pure or virgin iron is rarely found as a deposit formed as such within the earth, a famous example of this being the Ovifak iron found in Greenland by Nordenskjöld, but is more frequently found as sideral iron, iron which the earth has intercepted in its course through space. Sideral iron is too rare to provide the basis for an 'iron culture'. But it did perhaps motivate man to extract iron from the earth, as both sorts of iron were later used at the same time.

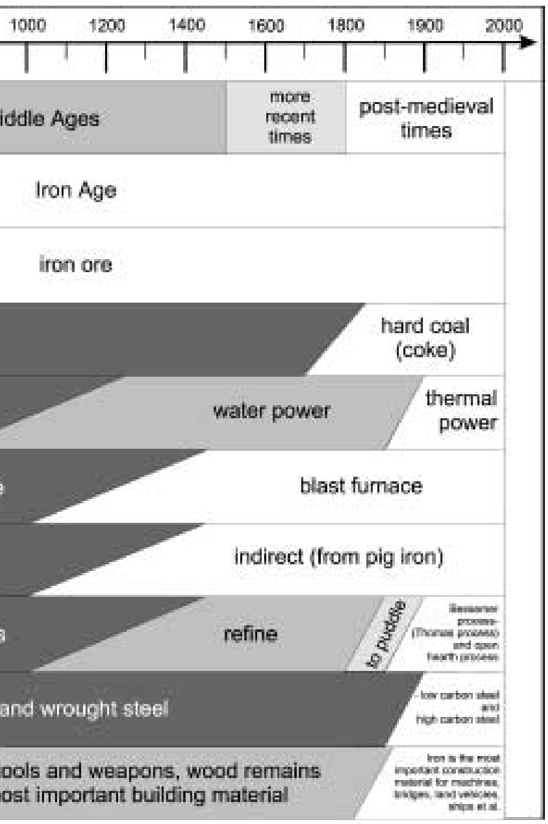


Source: Geschichte des Eisens, Dr. Otto Johannsen, Verlag Stahleisen m.b.H., Düsseldorf 1953

It cannot have been too difficult for the peoples who had mastered the bronze technology to smelt the more easily reducible sorts of iron ore, especially since these were to be found in many areas. Furthermore, because of its weight and its vivid reddish colour either in the fresh or rusted state, iron would have reminded the more seasoned smelter of copper ore. Processing the iron was no problem for the coppersmith, as he already knew how to soften metal up by annealing, and hardening by the process of cold-working.

That there was a connection between iron- and bronze-processing is proven by the fact that the Greek for smith was 'Chalkeus' (chalkos = ore, copper, bronze) and the Latin 'faber aerarius', which literally means 'ore-worker'. The first conscious extraction of iron took place when man picked out the beads of iron from the ashes of his oven and knocked them into shape as the smith does. He later learnt to weld the beads together into bigger lumps.

To begin with, iron ore was very rare and thus a very valuable commodity. In the tribute lists of antiquity, it ranked behind silver but in front of copper, and was incorporated into bronze as the precious metals were. Given that iron had long been a familiar metal, it remains a mystery what it was during that period of a thousand years that prevented iron



being used more often. It is only after the middle of the second millennium B.C. that iron finds become more frequent, and that iron is mentioned more often in written sources. It was between 1200 and 900 B.C. that iron became the most important and least expensive metal.

It is not clear which area was the cradle of iron technology. The barbarian peoples of the Near East appear to have been the first to use iron for the production of their tools and weapons. The paths followed by the dissemination of iron technology are indicated by the spread of the various sorts of blower. It is also possible to recognise certain cultural groupings by the smelting procedures they used.

Dr.-Rudolf-Eberle Prize for the ERSASCOPE

Celebrated as the "Oscar" of innovation awards, the Dr-Rudolf-Eberle Prize was presented by Dr. Walter Döring of the Ministry of Economic Affairs for Baden-Württemberg during an awards ceremony on November 24th, 1999 in Stuttgart, Germany.

The coveted trophy was accepted by Mr. Rainer Kurtz, President of ERSA Löttechnik GmbH, and by Mr. Mark Cannon, General Manager of the ERSA Soldering Tools Division, and inventor of the ERSASCOPE. Words of praise were offered for the innovative spirit and flexibility as well as for the venture someness of the mid-sized German manufacturer, of which ERSA Löttechnik GmbH has a long standing tradition.

It was in 1921 that the company founder, Ernst Sachs, patented the first electrical soldering iron for production use. During the following 80 years, this pioneering spirit remained, realizing scores of additional patents, design, and innovation awards for the soldering industry. Today, ERSA is Europe's largest manufacturer of soldering systems with the broadest range of products in the world. From soldering irons, to rework systems, and from wave and reflow, to selective soldering machines.

The system solutions provided by ERSA belong to those on the cutting edge of technology. And it is precisely on that cutting edge that ERSA is now opening a completely new range of inspection products based on the revolutionary ERSASCOPE Inspection System 3000.

Abb.: Managing Director of ERSA Dipl.-Ing. Rainer Kurtz in discussion with the Minister of Economic Affairs of the state Baden-Württemberg, Dr. Walter Döring, and the Lord Mayor of the town Wertheim, Stefan Gläser.

An impressive show at the world´s largest trade fair for electronic production

During the 13th Productronica in Munich, from November 9th-12th, ERSA presented its wide range of soldering technology products on 400 m². show space. Apart from to the classic soldering stations and soldering machines, Europe's largest manufacturer of soldering systems presented the revolutionary ERSASCOPE inspection system for the fist time in the world to the 57,000 international visitors. This high-powered microscope, based re-engineered from the classical medical endoscopes, allows for the non-destructive, cross-sectional inspection of hidden joints as found under today's most modern components e.g. BGA, µBGA and Flip Chip.

Together with the user-friendly software, the ERSASCOPE sets a new standard with regard to quality assurance. The response was tremendous and sent the sales figures soaring for this patented (pending) optical inspection system.

It was not only, however, in the new product area of quality assurance and inspection that ERSA excited the visitors but also in the area of core business. The two new selective soldering machines, ERSA Multiflow and ERSA Versaflow are setting new standards with regards to throughput speed and flexibility by selective solder machines. The ERSA Hotflow series reflow systems not only offer technical advantages over the competitors but also are easily serviced. The brand new Autoprofiler software for the Hotflow series makes setting the process parameters for temperature profiling child's play.

The featured programme of wave soldering systems offered fitting solutions for all applications requiring a customized system concept with high flexibility and the use of lead-free solder.

The Productronica Product Highlights offered by the Soldering Tools Division found equal excitement for the public. The response for high powered desoldering tools for industrial use, the X-Tool, was only topped by the feedback from the ERSA PL500A placement system. This system allows for an easy and cost effective upgrade to the existing ERSA IR500A rework center offering extended capabilities to BGA rework.

Although the doors of this year´s Productronica have closed for ERSA, one of the show's prestigious founders, the fair partizipation can already be realized today as one of the most successful in our company's history. It is also for this reason that we are already looking forward to the next Productronica in 2001.

Remaining true to our company motto – "ERSA Global Connections: helping the world keep things together".

Soldering – a never-ending story for more than 5000 years

Shortly after man learned to use metal for his means, he yearned to connect the pieces together. Many of the antique jewelry, tools, and weapons from the Bronze Age owe their usefulness and beauty to the science of soldering.

Although it is difficult to say exactly who it was that first "glued" two metals together, we know for certain that the ancient goldsmiths of the Egyptian Pharaos knew the art of connecting gold and silver. Over 4000 years ago in the territory of the Mediterranean, the building masters of Troy could be considered "soldering specialists", for during this period in which tin was discovered it soon became the preferred metal for soft soldering. The Cretians passed their techniques on to the Etruscans who, in turn, spread their knowledge to the Romans, Tunesians, and Spaniards. This useful science finally arrived in the "back country" of Europe, namely in the region of today's Switzerland, Bohemia, Hungary, Germany, and Scandinavia.
From culture to culture, generation to generation, this fine art was enhanced and perfected.

It was in this century, that not only the craftsmanship made great advances, but also the chemical, physical, and metallurgic background knowledge of the science was deepened. Soft soldering found its place in the electronic boom and has become one of the most important production technologies.

Ernst Sachs, the founder of ERSA, played a major role in the advancement of soft soldering in the electronics. In 1921, he engineered and patented the first electronic soldering iron and began with his "ERSA H1" a new era of soldering. It was now no longer necessary to continuously re-heat the antique soldering irons in an open fire. The ERSA H1, with its nearly 2 kg weight, quickly arrived at, and maintained its working temperature via its electrically driven heating element. The revolution was a critical turning point in the long history of soft soldering.

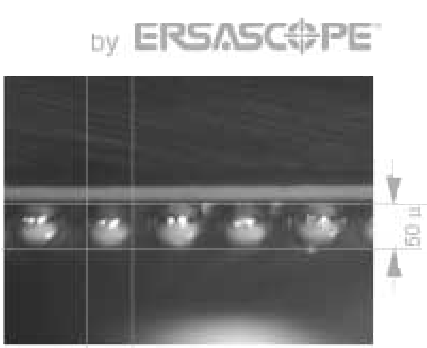
Just how significant the realization of this idea was, can be seen by various factors. The first is the continual growth of ERSA's presence since its inception. It is not by chance that this company, a member of the Kurtz Group since 1993, is Europe's largest manufacturer of soldering stations today. Since the first patent from Ernst Sachs in 1921, the pioneering spirit has guided the engineering of innovative solutions for the soldering industry. With the world's largest product range for the industry, ERSA can be proud of a yearly turnover of DM 70 Million.

When considering the importance of the soldered connection, the market potential is continually growing. How many of the products in our daily lives are electronic? Whether computers or mobile telephones, the automotive, aerospace, or medical industry, countless solder joints are keeping things together!

In principle, the science of soft soldering has remained unchanged for decades. The drive, however, for smaller and more powerful electronic assemblies is forcing manufactures producing soldering equipment to meet these requirements. The development of ERSA soldering tips underscores its commitment to remaining on the cutting edge.

In the beginning, a tip dimension of 20-40 mm was commonplace, whereas today a needle tip with a dimension of 0.2 mm can be the rule. From computer controlled soldering stations to wave, reflow, and selective soldering in-line machines, ERSA continues to offer complete solutions to a rapidly changing and growing industry.

Currently, ERSA is exciting the world and demonstrating that its pioneering spirit remains alive and well even after 80 years. The introduction of the revolutionary and award winning ERSASCOPE Inspection System 3000 (patent pending) is setting new standards for optical inspection and quality control. Hidden production deficiencies of advanced components like the BGA can be detected even in gaps of less than 50 µm. The ERSASCOPE allows the user to not only see and react, but also to measure and document failure analysis with its user-friendly software. This innovation can literally change the way quality managers guarantee process control – a dream come true!



It all began with a moulded Easter bunny

It often takes many years for materials, along with their own particular processing and application technology, to become generally accepted in practice. One good example of this is provided by the development of thermoplastic particle foam materials, which consist, to put it crudely, of 'air with a little something around it'. Put a little more seriously, these foams are materials with cellular structure, from which items in any shape can be produced, with the following qualities:

- low weight
- poor thermal conductivity
- a satisfactory level of compression resistance
- high energy absorption.

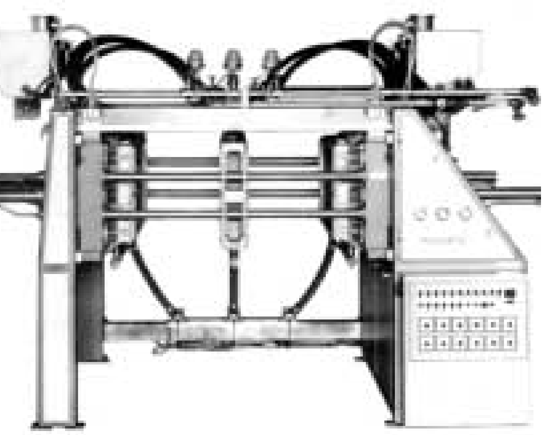


Fig.: One of the first shape moulding machines with double stroke

The production of mouldings made of particle foam material began in 1952 with an Easter bunny made of expanded polystyrene, poured into a two-part mould for chocolate and foamed in a bath of hot water. At the time this was a new and pioneering way of producing mouldings in any shape out of expandable polystyrene, which had been invented two years earlier. This event took place in a BASF laboratory in Ludwigshafen.

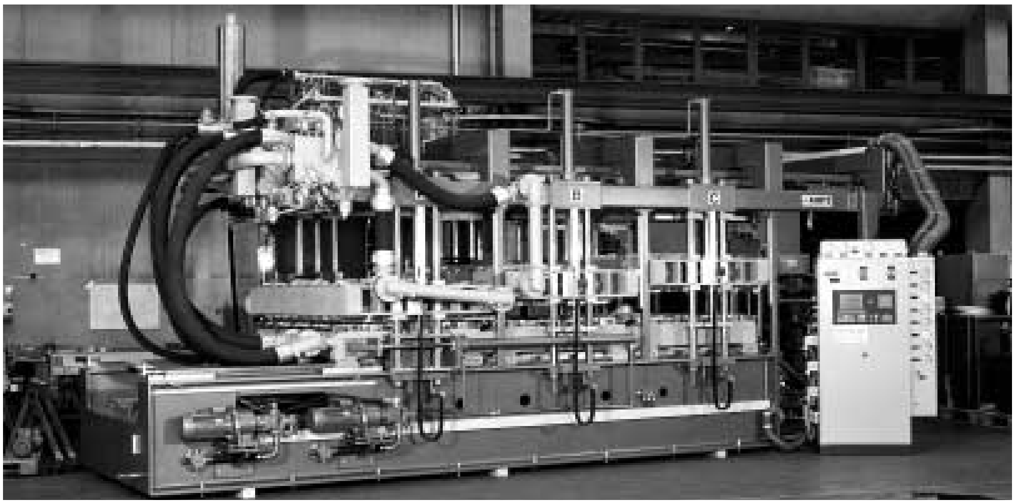
It was subsequently a good ten years before the breakthrough came that realised this the processing and application technology potential of this particle foam material, which came to be known as styropor. The hot water bath used for foaming was soon replaced by water steam. The first useful mouldings were flower-pots and simple packing cushions, produced by hand. Two-part manual moulds made of aluminium were filled with expanded polystyrone particles using core-shooter machines, and pushed into a steam autoclave. After being heated and foamed, they were then cooled in a cold water bath. The appropriate devices and machines which would have been able to make this labour-intensive process easier did not yet exist - they still had to be developed.

The first machines came on the market at the beginning of the sixties', but very often they did not function satisfactorily. The necessary processing know-how was only available to a very small degree; the constructional options, the design of the machine parts and indeed the conception of the machines were all insufficiently developed. At this time numerous firms went into production but by the beginning of the seventies', most of them had given up.

In retrospect, that was a good time, armed with the know-how of the moment and a well thought-out concept, to start building machines for the growth-oriented producers and users of mouldings made of particle foam material.

In February 1971, in spite of scepticism expressed by some outside the company, Dipl.-Kfm. Otto Kurtz, the then company proprietor and now our senior director, made the decision to strike while the iron was hot. Before the year was out the first KURTZ shape moulding machine, model 610D, was already built and being delivered. Model 812 was exhibited at the Hannover fair in 1972, and further models followed in due course. As was to be expected, the years that followed saw these models being delivered to an ever-increasing number of

Fig.: Shape moulding machine K 1016 TV3 with transfer technology



customers. Participation in a number of international exhibitions the K-Fair in Düsseldorf, and furthermore KURTZ's own in-house fair have contributed significantly to the fact that KURTZ now leads the market in this field. One after the other, factories and offices were founded abroad, and this served to consolidate KURTZ's market position by offering on the spot expertise and qualified after-sales services.

Nowadays the KURTZ GmbH production series encompasses shape moulding machines with their accessories, handling systems, pre-expanders, recycling plants, block moulds and cutting plants - in brief, more or less everything that is necessary for the production of goods made of thermoplastic particle foam materials.

Cutting lines and their construction history

It was only a short time after the first shoe-cream containers had been foamed with expandable polystyrene that the material's outstanding heat insulation qualities were recognised and all sorts of applications were immediately recognised, above all in the building industry with its need for extensive flat insulation. What, however, was lacking was the necessary processing machinery. It was a relatively simple matter to produce blocks by means of autoclave steaming in simple moulds. How the processing should be continued was at first something of a puzzle, until in addition to the simple cutting of blocks with blades a new method was found, namely cutting with heated cutting wires - a method which was to become more and more common in the future. Nowadays cutting lines are state-of-the-art, and commercial production of large areas of insulation panelling for outside walls, inside walls and roofs would hardly be conceivable without them.

Alongside cutting with saws and band knives, cutting with hot wires was a method which was employed very early on. In this method, the cutting is effected when the cutting area of the block melt on contact with electrically heated resistance wires. At first separate devices were built for the three work stages - trimming, formatting and the sheet cutting of the panels. They were initially propelled by their own weight on slanted working surfaces or rolling tables, and then later motor-driven by conveying chains or conveying belts. Simple cutting lines were also designed, in which the entire block was moved manually through fixed wires. And other machines were developed, in which the block itself remained immobile and the wires, stretched on a frame, were moved through the block.

The disadvantages of these devices included the small production in relation to the labour involved, and the clearing of waste by hand.

Later a new working principle was incorporated. The cutting wires were heated not only by electricity, but also by deliberately increasing the friction

Fig.: Cutting plant S3

... Cutting lines and their construction history

between the wires and the block itself. To achieve this, the cutting wires together with their frames had to be set in oscillation, and the block was transported by means of a feeding device through the heated and oscillating wires. This development brought about a considerable increase in the cutting speed and a substantial improvement in the surface quality of the sheets being cut.

As a result of the very high acceleration and deceleration energies, which had to be kept in check by the masses in motion, oscillations were for a long time restricted to 4 to 5 mm. It is true that there were other developments (cold-cutting), but these machines had to be set on fixed foundations, had a very high noise level and required frequent servicing. The KURTZ long-stroke technology brought about a considerable improvement in oscillation techniques. This involved 2 frames oscillating in opposite directions, increasing the stroke to 60 mm, and resulting in a further increase in the cutting speeds and a significant reduction in the picture frame effect.

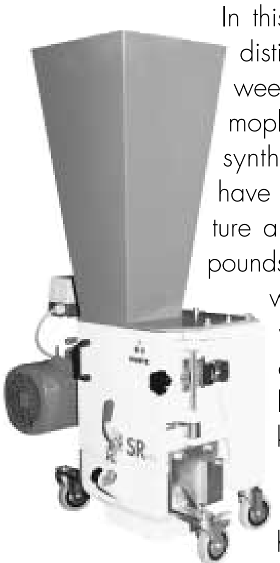
It was nevertheless not only in the field of cutting technology, but also in the field of automation technology that these cutting installations underwent substantial development. All the adjustments in the first installations were made mechanically, though the process of changing the wires was soon improved considerably by the introduction of replaceable frames. A significant improvement in set-up times was achieved when the wires on all three stations were fitted with remote control adjustment devices. The machinedown times were thereby reduced considerably and it was made possible to cut the sheets to a significantly higher degree of accuracy.

Developments in the most recent past show that importance is being attached not only to the cutting of the blocks, but also and increasingly to the handling of the sheets. A fully automatic processing line, beginning with the block and ending with the wrapped sheet stacks, is no longer a rarity.

Fig.: Cutting plant: Sheet cutting station with long stroke device and automatic remote wire adjustment

Plastics Recycling: "Otti the Grinder" - the KURTZ Granolator

Plastics technology is one of the youngest technologies of modern times and only found its place in our life at the end of the nineteenth century. After the introduction of Bakelite the first products to attract attention were garments made from synthetic materials, namely blouses and ladies' stockings in artificial silk. These are products we can hardly imagine living without nowadays.



In this field there is a basic distinction to be made between duroplastics and thermoplastics. Duroplastics are synthetic materials which have a tight molecular structure and form chemical compounds; they are not plastic or workable, not fusible or weldable and are thus considered to be insoluble. The materials known as thermoplastics are made of molecular chains of the hydrocarbon range. These materials are consequently fusible, weldable, soluble and capable of swelling. In order to produce materials and workpieces in thermoplastic materials, it was first necessary to construct suitable machines. To begin with, these were presses and simple injection moulding machines. Subsequently, themoplastics were extruded and blown. These production procedures all resulted in waste. This waste could however be re-used, as the physical characteristics of thermoplastics made it easy to incorporate them in the regeneration cycle. And suitable machines had to be constructed for this process as well. This was when production of synthetics granulators began.

To begin with they were very simply built, their design deriving from the field of wood technology. At the beginning of the 1970's there was a sharp rise in the cost of plastic materials. It was clear that the time had come for recycling to be put into practice.

This was the moment when 'Otti the Grinder' first saw the light of day. From this time on it was impossible to imagine life in plastics processing plants without granulators. Although the technology of granulators may have changed somewhat in detail, the basic idea remains the same today. KURTZ has granulators for every sector of the plastic materials industry. The quality levels and technical design of these machines are of the highest standard. The grinding of abrasive plastic materials and both the scissor-cut rotor and the shear-cut rotor have become standard features; they can in any case be incorporated without difficulty in production machines as inline recycling plants in the form of KURTZ granulators.

1999 saw a new orientation in the field of granulators, which it was necessary to present in time for the specialist trade fair Fakuma to all those concerned. This included new developments, improvements in the details of individual machines, and a revised strategy for the German-speaking market. To this end, all European sales reps were invited to a conference on September 10th, 1999 in Wiebelbach, where they were introduced to the new marketing concept and sales policy for all granulators being sold under the brand name KURTZ.

The new production possibilities at MBW and the tightening up of sales organisation were the main subjects on the agenda, and the first successes were noted at the Fakuma in Friedrichshafen, where the sector was presented to the public with a new image. The response was good, and the number of contacts made, significantly more than twice as many contacts as at the last trade fair, give us good reason to have confidence in the new course now being followed.

'Otti the Grinder' is the KURTZ Granolator for the 20th century and has become a byword for low noise levels, economic efficiency and high performance levels ...

Honours at KURTZ

Mr Erich Streichsbier (Vice President Sales) and Mr Gerhard Gegenwarth (machine fitter) were thanked and congratulated on 40 years loyal service with the company. Adalbert Kneip (lathe operator), Roland Lannig (machine fitter), Helmut Mattern (driver), Harald Sommer (Manager, Project Department) and Walter Weiss (mould-maker) received due recognition for their 25 years' service.

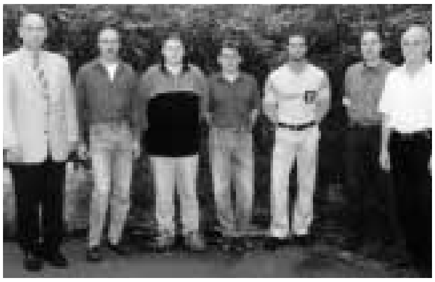
Anniversaries

Thomas Sedlacek and Christian Siegl received due recognition for their 15 years service, and Roman Gruber and Martin Ritzinger were congratulated on their 10 years with the company.

Fabi-Prize

From September '97 to July '99, Sabine Hörner completed a apprenticeship in industrial business studies at ERSA. She took first place among all the candidates in her final exam at the Wertheim College of Business Studies. She furthermore received prizes from the association of firms with in-house training schemes in the Main-Tauber area (FABI) and from the Chamber of Commerce in Heilbronn. Today, Sabine Hörner is working in the personnel department of Kurtz Holding.

Foundry mechanics



from left to right
Dr Helmut Diehm (Personnel Manager), Günther Krebs (foundry trainer), Georg Beringer, Waldemar Abst (foundry mechanics), Silvio Parino (youth representative), Helmut Scheurich (Works Committee, Deputy Chairman), Werner Dressler (machine factory trainer).

The new generation at Kurtz and ERSA

from left to right: Werner Dressler (Trainer/Kurtz), Evelyn Wiegand (industrial businesswoman/Ersa), Jochen Adelmann (student on work experience), Sophia Frangopulos (technical draughtswoman/Ersa), Bernd Bundschuh (industrial mechanic/Ersa), Daniel Schwab (machiner), Michael Stier (galvaniser/Ersa), Nina Günter (industrial businesswoman/Ersa), Martin Schneider (electrician/Ersa), Frank Weimer (industrial mechanic/Ersa), Daniel Moritz (industrial mechanic), Florian Geyer (industrial mechanic), Michael Behringer (foundry mechanic), Johannes Noth (machiner), Wjatscheslaw Kvening (technical draughtsman), Matthias Ziemert (foundry mechanic), Björn Dosch (electrician/Ersa), Michael Haas (foundry mechanic), Alexander Ratter (technical draughtsman), Sven Züchner (industrial businessman/Ersa), Hans-Peter Blum (industrial mechanic), Jürgen Schmidt (trainer/Ersa). The new trainees at Kurtz Altaussee are: Peter Eidlhuber (machine fitter), Mike Handl (installations fitter), and Peter Steinegger as works electrician. (Also in the photograph are Herbert Grill and the two trainers Johann Rainer and Karl Weinhandl.)

A striking hobby - to coin a phrase

The author of this article worked for many years in our construction department as a development engineer with a variety of different responsibilities. He also ran the in-house suggestions box and sat on the works committee. As a change from his many duties Mr Philipp Hügel relaxed by working

the soil of a garden by the river Tauber in Wertheim. In the course of the years his garden soil yielded a harvest of 42 small coins - of little apparent beauty or interest.

It was only thanks to careful cleaning that he was able to establish the years when the coins were minted, which went well back into the 17th century. One surprising thing was that he found no coins from nearby Wertheim. Mr Hügel inevitably got more and more deeply involved in research into the history of the coins, and particularly into the history of the 'Löwenstein-Wertheim Mint' (1356-1808). He took particular care determining the coins' respective mints, the rulers under whom they were minted, their weight and composition, not to mention their historical background. He was thus able to acquire profound insights into finance and economics in the Middle Ages.

Mr Hügel was also a talented draughtsman, and in the course of time he built up a pictorial documentation of more than 1000 illustrations, which were then incorporated into Ferdinand Wibel's 'History of the Mint of the Princes of Wertheim' of 1880, expanding that publication considerably. The 16 coin paintings are highpoints in this documentation.

A further milestone in the achievements to be noted in this field was set by three enthusiasts at the beginning of the 70's. Under the aegis of the 'Historical Society of Wertheim', they founded the group 'The Friends of Numismatics'. The results of their many years of research in the coin collection of the Wertheim Museum are now accessible to all who are interested. The most recent research has shown that coins were already being minted in Wertheim even before the attested right to mint coins was granted to the Princes of Wertheim by Karl IV in the 'Golden Bull' of 1356. These were so-called 'bracteates', which are notable for the thin silver they are made from, and for the fact that they are only stamped on one side.

In view of the forthcoming introduction of the 'Euro', or indeed to give us insights into the function of the National Bank of Germany with regard to currency stability, the study of the monetary systems of yester-year can help give us a better understanding of today's financial world.

Yours Philip Hügel

Kurtz

Industrial Technology Companies

Successful Expansion

The fcompany MBW Metallbearbeitung Wertheim GmbH has bought up part of the assets of the insolvent company Grürmann Metallverarbeitung GmbH & Co. KG, Erlanger Straße 9, 91083 Baiersdorf, thus making it possible to save the jobs of the entire staff. The two fir companies' operational bases are linked with one another by computer network and they complement one another ideally as regards production technology; these conditions enable the customer to make best use of the full range of services and products on offer.

MBW Metallbearbeitung Wertheim GmbH, with nearly 70 employees, has at its disposition a spacious and modern plant, which for the most part produces high-quality thin sheet metal goods in steel, high-grade steel and aluminium. The machining is done by CNC-lasers, and CNC punching and bending machines, not to mention the usual welding processes. MBW not only provides its customers with ready-to-install parts with treated surfaces, but also assembles complete units on customers' premises.
In addition to their own production programme, the company also manufactures granulators for the plastics industry, marketing them under the brand name KURTZ. These machines are used for the cutting up and recycling of plastic waste.

A significant increase in turnover is expected at Baiersdorf, customers in the Nuremberg area providing the target group for this development.

The first successes have already been achieved, as it has been necessary to employ additional skilled workers for the CNC-machines and to extend the workforce in the welding sector.

It is the firm's intention to give their customers complete satisfaction with high product quality, quick delivery times and competitive prices.

260 Mio DM turnover • 990 employees

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