



Theme: Manufacturing in the new injection moulding factory Ergenzingen

Standards in practice

EVI The sum of many small improvements moves a company forward. The KVP concept, already introduced at several German locations, is called EVI (ENSINGER Improvement Instrument). With the use of standards, i.e. defined procedures and rules, as well as training, work is being carried out to make the unfamiliar daily routine.

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Light and capable of bearing heavy loads



Elevators require a multitude of guide pulleys. Compared to conventional materials, modified TECAST custom cast polyamide offers substantial advantages, above all the low weight. It reduces the inertia of the entire system. Prior to use, the pulleys are subjected to different loading tests. Simulation tests also provide information about the long-term characteristics.

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Dear Readers,

It is unbelievable, all that can happen in a year. In summer 2008, crude oil cost more than it ever had, then the price fell by more than seventy percent. Since the beginning of this year, the oil price has increased dramatically once again. Stock exchanges have developed in a similar way, followed by the turnover of manufacturing industry and the reluctance of banks to grant credit. The unbelievable thing is not the parallels of these developments, but the scale of the changes. Political countermeasures were similarly massive. Financial guarantees, credits and economic stimulus packages in absurd dimensions exceeding billions – the stunned taxpayer can only watch this gigantomania and ask where it is all going to end. My impression is that no one really knows, no matter how stridently things were proclaimed in the election campaign.

Are you also left with the feeling that such extremes of falling and rising trends cannot be healthy? Changes are often for the good, but don't you think they should also be in moderation? In the cosmos of our company we are convinced of this. That is why we do not start a new program every six months, in order to go with the latest trends. This may work in the fashion industry, but with engineering plastics

and when dealing with our customers and employees we prefer to rely on a certain degree of continuity.

We are constantly working towards improvement, but in small and steady steps. "Continuous Improvement Process" is the keyword. This is not new and neither did we invent it. We owe the breakthrough in this concept to the American William Edwards Deming. Its effectiveness can be seen in the success of numerous companies, first and foremost Japanese enterprises, which have internalized this concept for a long time. For our purposes, we renamed the program to EVI. You can read more about the "ENSINGER Improvement Instrument" on page 5. But be aware, it's all about small and steady improvement steps. We do not always get it right, but we make our work a little bit better every day. That you can count on, even in these volatile times.

I wish you and your families a Merry and Peaceful Christmas and good luck, health and success in 2010.

Yours sincerely, Roland Reber

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The title photo shows Christian Herrmann and an injection moulding machine in the factory at Rottenburg-Ergenzingen.

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Transparency and energy efficiency

New injection moulding plant in Ergenzingen



Tidied up:
The 150 metre long
production and
processing hall

[JF] The new injection moulding factory in Rottenburg-Ergenzingen has now been in operation for nine months. Before this, the division was located in Nufringen, where there was no longer space for expansion. The new, ground-level factory excels with its transparency, short distances and energy efficiency.

For the new building with its 17,000 square metres, ENSINGER chose a site located directly next to the A 81 motorway, which offers good transport connections. The 150 metre long production hall, the open logistics areas and the two-storey office block merge with one another. "Clearly arranged layout and an optimal material flow are the main prerequisites for manufacturing injection moulded precision parts efficiently", Reimar Olderog, Divisional Manager Injection Moulding explained. All plant areas are closely integrated with one another – organization and quality management are geared to meet the high demands of our customers. In order to create the best possible working conditions, the specialist departments of the division were consulted in the planning of the factory. Each area of responsibility

appointed a representative to be a member in the project team. "This increased the acceptance of ideas which had initially been assessed critically", the factory manager reported.

Material flow in focus

The architecture is based on a concept by the planning office DIA 179 from Berlin, which had already designed the extension for the ENSINGER plant site in Cham. The flow of goods was an important factor during planning of the injection moulding factory. The flow of materials – from the delivery of the plastic granulate to the transport within the production hall as well as the distribution of the finished products – was reduced to a minimum.

Thanks to a long skylight and translucent industrial construction glass in the exterior walls, the production hall is flooded by daylight. The process-controlled injection moulding machines are arranged in rows. As the "backbone" of the factory, a middle lane connects the areas of production planning, injection moulding production and further processing.

Thomas Musch, Head of Material Processing – from here the granulate is transferred to the injection moulding machines via a distribution system



Like small houses made out of glass and concrete, two box-shaped installations appear in the middle of the production hall: This is where production planning and quality control take place.

Drying and mixing

During the storage of plastics, humidity from the air is deposited on the surface of the material. With hygroscopic materials, core moisture is also formed in the granulate. In order to avoid vapour bubbles forming during heating, which would make the material in the injection moulding machine and finished parts useless due to cavity formation, the granulate has to be dried before processing.

In Ergenzingen, ENSINGER has installed a central drying facility and conveyor system from the Allgaeu plant manufacturer Motan: The drying hoppers are fed via a central vacuum conveyor system. In order to supply an injection moulding machine, the necessary amount of dried granulate is transported from the hoppers and mixing tanks into the production hall using vacuum lines. A “coupling station” in the pipe system ensures that every material is available at each injection moulding machine, when needed.

The plant makes a major contribution towards minimizing the reject rate and improvement of the processing quality. This also includes batch traceability, which facilitates consistent documentation of the overall material flow.

Energy cost optimization was a major consideration in the design of the technical plant. By recovering heat from the ventilation system, the material drying process and from the process cooling water, the radiant panel heating system in the logistics

areas can be supplied with energy. The waste heat from compressed air generation is also available for heating the service areas.

The separation of planning and manufacturing processes, which is common in most factories, was altered in Ergenzingen. The development, project management, purchasing, sales and quality management departments were grouped around two atriums, with direct eye contact and access to the production areas.

Communications

Alongside the cafeteria, the so-called communications stairway provides an additional opportunity for the exchange of ideas between employees: employees find a large and already very popular standing conference table with adjoining kitchen. The necessary dialogue partners are quickly found in our company. Conversation instead of impersonal emails – a pleasant side effect of this particular architecture!



New standards

Continuous improvement through workshops

By Erik Stolte

It is normally not the big inventions, which bring advancement to a company, but the sum of many small improvements. To encourage this, repetitive standardized workshops are being carried out at which employees look at the most important operational sequences and processes in groups, define measures for improvement and implement the same. In short, a continuous improvement process (KVP).

As the term KVP is not uniformly defined, we at ENSINGER have developed our own KVP-concept. It is called the ENSINGER Improvement Instrument – EVI for short – and it is divided into three levels. Level 1 is about every single employee and his/her job, level 2 focuses on teamwork in a group and level 3 deals with group processes. The main focus in each workshop is to create standards, which help to implement improved operational sequences and rules to make them become daily routine.

The heart starts beating at level 2

In order to teach the employees these methods and procedures – first of all at the sites in Nufringen and Ergenzingen – trained coordinators and moderators are provided to give support. In the meantime, the first EVI level 1 workshops have been successfully completed and the introduction of level 2 has started.

The heart of EVI really starts beating at level 2 – as the majority of workshops start here. This is where employees develop and implement department-internal standards. These standards enable the respective department to reduce errors, receive and forward information and materials quickly and without loss, to increase productivity and continuously increase the awareness of quality.

For both the participants and for the moderators and coordinators, the workshops are exploring new ground. At first, often scepticism and restraint is the first reaction. All workshops have shown, however, that the commitment of the group continuously increases during these meetings. At the beginning, the moderators facilitate participants to overcome their reluctance by using questioning techniques and other methods and quite often they have to ensure that the objective remains in focus and one does not “get carried away”. The neutral position

of the moderators gives the participants the additional possibility of explaining their own processes in a simple way and, based on this, to then achieve their objective effectively. In this way, the initiative for solving the problems remains with the experts: the participants themselves.

But, of course, hopes and fears are also associated with these workshops. On the one hand, it is very positive for many participants that problems can be addressed actively and openly, and that an official timeframe is provided for solving well-known problems. On the other hand, doubts about whether EVI will really remain a permanent feature and will not gradually be stopped after a certain time, are noticeable again and again.



Continuous improvements lead to success. EVI moderator Martin Schöwe describes how important it is to ensure that even small steps follow standards.

In the long run, it will be up to us all as to how long and how intensive continuous improvement programs are ‘lived’ in our company. It is no coincidence that the personal responsibility of each employee and superior still plays the key role in the ENSINGER Improvement Instrument. Even in times of full order books, it is still all about “catching chickens or patching fences”, and especially in such phases the entire company will profit from lean and effective processes.

Erik Stolte is a project engineer (semi-finished products division) and one of the EVI moderators.

Kundert AG: Pacemaker in Switzerland

[JF] More than one hundred years ago in Zurich, Ernst Kundert wrote the first chapter of a Swiss success story. Even then, when the founder of the company sold products for the textile industry, flexibility and mobility was a must. Thanks to the consistent orientation to changing market demands, the family-owned company was able to establish itself as a manufacturer of pacemakers. Today, KUNDERT AG is one of the most versatile and largest suppliers of plastics in Switzerland.

The cooperation with ENSINGER began in the mid-1960s, when thermoplastic polymers began their triumphant success. First, both companies concentrated on the trade with semi-finished products.

Later, injection moulded parts and customer projects were added, for example, the development of industrial profiles. One of the most important products, which was co-developed by Wilfried Ensinger, are sliding plates made of carbon fibre-reinforced TECAMID 66 for railway switches for the Swiss railways. KUNDERT started machining at the beginning of the seventies, and at the same time the semi-finished product industry gained importance.

For twenty years, the Swiss family-owned company has been managed by the third generation: Markus Kundert is responsible for the sales and technical departments, Stefan Kundert for the areas of finance and organization. They pursue the common goal of offering the maximum possible service and, the two brothers emphasize, "uncompromisingly aligning the company towards greater customer satisfaction".

120 employees work at the company location Jona in the region of St. Gallen. In addition to

the machine processing of semi-finished products, the main focus is on coating metal and plastic cores as well as the production of moulded polyurethane parts. More simple plastic parts are manufactured at a subsidiary company in Prague. An online shop strengthens the sales potential – material and process specialists advise technical designers in the choice of suitable materials, similar to ENSINGER. In this transnational cooperation, ENSINGER provides the technical versatility for the group of companies, while KUNDERT has very close contacts to users in Switzerland. Both companies have been able to open up new markets over the decades. According to Stefan Kundert, ENSINGER has not really changed, despite the worldwide expansion. "It is exceptional that both companies were able to maintain their close cooperation, even in times of rapid growth."

Open communication and project-oriented co-operation of both enterprises is the prerequisite for this collaboration, confirms Franz-Dieter Eisenhardt, who manages the industrial profiles and pipes division at ENSINGER: "In order to be able to provide end-users with the perfect solution, we visit customers in Switzerland together and work on joint projects. What started with products for textile machines continues today as one of the most successful developers, manufacturers and suppliers of profiles and moulded parts for conveyor technology, machines in the food-industry and medical technology products."

But, of course, co-operating companies can get in each other's way as a result of globalization, says Stefan Kundert. "For this reason, both parties are forced to try even harder. But that is what a successful business partnership is all about."



Markus Kundert



Stefan Kundert

Optimum machining

ENSINGER has developed a new formulation for the material TECAPET. Compared to conventional PET, this material can be machined more precisely and faster – with the same good quality of the surfaces and the formed edges. Besides this, new TECAPET with its high degree of whiteness fulfils the challenging requirements of the pharmaceuti-

cal and food industry. The mechanical and tribological characteristics could also be maintained at this high level. As cavity formation of the material occurs only rarely, even when working at high operating speeds, productivity can be increased.

For more information see www.tecapet.com





BUILDING PRODUCTS

Thermix WinUw shows what warm edges can do

ENSINGER WinUw Rechner

Nur repräsentative Rahmenprofile und Verglasungen entsprechend EF-Datenblätter

Rahmen	Holz 1,4	U_f	1,4	W/(m ² K)
Abstandhalter	Aluminium (EN ISO 10077-1)	ψ_g	0,080	W/(mK)
Glas	Zweifach-Isolierglas 1,1	U_g	1,1	W/(m ² K)

Fensterbreite	1,23	m	Fensterart	Temperatur
Fensterhöhe	1,48	m	<input checked="" type="radio"/> einflügelig	innen
Rahmenbreite	0,11	m	<input type="radio"/> zweiflügelig	außen
				Tsi
				Rsi

Glasrandlänge	4,54	m	Glasfläche A_g	1,27	m ²
Rahmenanteil	30	%	Rahmenfläche A_f	0,55	m ²
			Gesamtfläche A_{ges}	1,82	m ²

Berechneter Wärmedurchgangskoeffizient

$$U_w = \frac{A_g U_g + A_f U_f + 1,1 \psi_g}{A_g + A_f}$$

$U_w = 1,39$ W/(m²K)

Vorschau Detail Info Rechnen Drucken

[Wey] On the website www.thermix.de, the Building Products Division is presenting a new interactive demo-software „WinUw“, in which the U_w -values are calculated according to the ψ -value data sheets of the German Federal Flat Glass Association, according to the ift-guideline (Institute for Window Technology e.V. at Rosenheim) or manual calculation. A detailed consideration provides elevations according to frame material (wood, aluminum, wood-aluminum and plastic), temperature gradient, isotherms and heat – both for double and for triple insulated glass. Just how important Thermix® spacers are for good results can be seen in a direct comparison with aluminium spacers: with Thermix the U_w -values improve by around 0.1 W/(m²K) or more – an important computable value for achieving the legal standards in this area. The minimum temperature T_{si} at the edge of the glass improves considerably and clearly reduces the danger of condensation.

Hot autumn at the trade fairs

There were a number of important events in the trade fair calendar for the Building Products Division. This started with the “GlassBuild America” in late September, which took place in Atlanta this time. In October, the industry met at the “Vitrum” in Milan. This was followed by two also successful trade fairs in November; the “Batimat” in Paris and the “Greenbuild” in Phoenix/Arizona.



CUSTOM CAST

Aiming high: Guide pulleys for elevators

[JF] More and more skyscrapers are being built in major cities, especially in the growth regions of Asia, where the average building height is increasing from year to year. The manufacturers of elevators have adapted to this trend by permanently developing new technologies. In October, visitors were able to inform themselves about innovations in the international elevator industry at the leading trade fair in this field, „Interlift 09“ in Augsburg. No crisis was noticeable in the exhibition halls. The ENSINGER Custom Cast Division was also extremely satisfied with the feedback from its first exhibition attendance in Augsburg.

About half of all elevators worldwide are cable lifts, which require a number of guide pulleys. In this area of application, plastic – in particular the specially modified cast polyamide TECAST mod. – also offers major advantages compared to conventional materials:

- Guide pulleys made of high performance plastics are approximately seven times lighter than cast iron pulleys. The lower weight simplifies installation significantly. Because of the lower gyrating mass, the inertia of the entire system is reduced.
- Pulleys mad of TECAST mod. are resistant to corrosion.
- The service life of the cables increases substantially thanks to the low modulus of elasticity.
- When using plastic guide pulleys, operating noises are reduced considerably compared to cast iron alternatives.



In order to prevent damage in practice, guide pulleys are exposed to all manner of stresses before use. In cooperation with scientific institutes, ENSINGER has carried out simulation tests on long-term performance characteristics. Changes in dimensioning can be made quickly and without a lot of effort.

For this reason, the already low weight of TECAST guide pulleys can be further optimized: critical areas are strengthened, while material can be saved on minimally stressed parts.

One thing is clear though: Safety always takes top priority in the passenger transport field.

THE THIRD SUBSIDIARY COMPANY
WAS FOUNDED 20 YEARS AGO

Sales strength in France

By Loïc Chergui und Olivier Gauby

One of the most important target groups in the French plastics market is that of the specialist trade dealers. In order to gain market share in this segment, Wilfried Ensinger founded ENSINGER France twenty years ago as the third subsidiary. Headquarters of the first office was Goussainville, in close proximity to the Paris airports Roissy and Le Bourget.

In France, the entrepreneurial group also set an early emphasis on the high-temperature plastic TECAPEEK. Because of the large demand from industry, ENSINGER France was able to double its sales within a few years and became the country's market leader with this material.

Under one roof

In order to expand the product range in France, ENSINGER took over UMP (Usinage Matières Plastiques techniques), a specialist machining company for plastics, in the year 2000. Five years later, the core company moved into a building in Beynost near Lyon, together with UMP. The objective of the amalgamation was to simplify the co-operation of the two companies and to optimize the cost structure. Olivier Gauby took over the responsibility for the semi-finished products division, Hélène Brenac for finances, and Loïc Chergui as manager in charge of machining, in addition to the administration of both divisions.

With a total of forty employees, ENSINGER pursues a holistic strategy for the French market, in which sales of semi-finished products are to be strengthened and the position in machining and for the industrial OEM range is to be expanded. Additionally, UMP has developed a sales and marketing department under the direction of Renaud Pontier. In the meantime, the team has been able to gain new customers in the areas of medical technology, aerospace as well as in

the mineral oil processing industry. With constantly increasing quality demands, the new organization satisfies the needs of a target group, which expects comprehensive commercial and technical support in long-term projects. ENSINGER France is able to directly participate in technical projects of end-customers. In addition, a key account manager explores the requirements of potential customers in the market for high performance plastics.

The market for machined products is still very strong in France, which opens up numerous possibilities for UMP. The long-term objective is to capture the technical sector; in view of the current crisis, activities are also concentrating on other focal points with lower added value. The decrease in orders from regular customers can be compensated for by making quick sales in these markets.



Olivier Gauby (right) heads sales and marketing of semi-finished products at ENSINGER France S.A.R.L., Loïc Chergui (left) is the manager in charge of the machining unit UMP, which belongs to the company group.

WILFRIED ENSINGER PRIZE

Master and doctorate

[JF] In October, the Scientific Working Group for Plastics Technology (WAK) honoured two outstanding pieces of scientific work. Benjamin Rudin was

awarded the Wilfried Ensinger prize for his master's degree thesis on "Rheological properties of thermoplastics" (University of Erlangen-Nuremberg) and Dr. Holger Ruckdäschel for his doctorate thesis in the field of "Micro and nano-structured polymer blends" (University of Bayreuth).

The prizes were awarded during a festive colloquium in Paderborn.