TECH TRENDS

TECHNICAL NEWS AND TRENDS FROM PREVAS # 1 2010

PREVAS 25 YEARS

Focusing on the Future and a Story to be Proud of

Energy Trends

How to reduce energy consumption and halt emissions of greenhouse gases? These days, many like to talk about their environment-protection efforts.

Read more on page 4

Industrial Processes

With help from the TESS product, supervising heating furnaces, the steel industry is able to increase its profits.

Read more on page 6

A Leading Product

Quality and traceability mean everything when Ragasco from Norway makes gas canisters for consumers and the automotive industry.

Read more on page 8

LEADER

It is Possible to Make Money out of one's Environmental Concerns

The environment is a hot topic. In all of industrial Sweden, intensive work is going on to reduce emissions and increase efficiencies to produce more but consume less. This can be seen in everything from political decisions to the density of transistors on electronic chips.

At Prevas, 25 years after establishment, we find ourselves in the middle of these efforts. Now as then, it is about using technology and know-how to work smarter and more cost-effectively. But where it previously was the wallet only that dictated developments, concern for the environment has now arisen as a factor of comparable importance.

Avoid Artificial Respiration

Increased awareness of the fragility of the environment has spawned new environment-related rules and regulations, affecting a significant part of everyday industrial operations. It is commendable that our elected representatives establish goals for environmental protection and that they hurry up the process of reaching them, but it is important that the decisions they take are based on solid knowledge. Otherwise we run the risk of spending tax funds on measures that work like artificial respiration. Such projects and solutions, lacking financial viability of their own, run the risk of becoming cul-de-sacs, impeding the development of green technologies that do work and bring true benefits.

In this area, Prevas and others, possessing important know-how, have an important mission to spread the word that green technologies are available and what they are able to bring.

Both companies and decision-makers, setting up regulatory frameworks, need to know which possibilities are available and what works, both environmentally and financially.

A Growing Toolbox

Looking back at our 25 years of existence, one notices that not only has our customers' environmental awareness risen, but our box of tools has also expanded enormously and become ever more powerful and sophisticated as computer power has all but exploded.

From having programmed at low levels on VAXes, PDPs and the odd microcomputer 25 years ago, we these days work with much larger and more powerful modules of hardware and software which we adapt and combine into finished solutions for our customers.

Modern technology allows us also to consolidate data from many different sources and find correlations which in turn permit coordination of processes which previously were uncoordinated and provide the full pictures managers need to see to make the right decisions at the speed today's business climate requires.

Read More

Hopefully you will find something of interest among the various stories about how we on the basis of technological know-how are able to contribute to both a healthier environment and sounder finances.

Christer Ramebäck,
Business Area Manager,
Industrial Systems
Prevas AB

M2M

Communication among different machines, both at home and in industry, is a clearly visible trend. Prevas has a strong product portfolio in this area, containing industrial systems for product tracing, quality follow-up and logistics. Examples of benefits of machine-to-machine communications are automatic detection and trace-back of quality problems, more efficient materials flows and optimized maintenance.

Prevas is also a leader in Scandinavia in embedded systems and most of the product developments Prevas participates in contain a large measure of communication solutions. Prevas is part of Telia's Partner Program.

Green Peas from Findus

Prevas has been awarded a contract by the frozen-food supplier Findus to supply, install and commission three automation and manufacturing execution systems for the company's Bjuv facility in Sweden as part of a plant-wide modernization project.

Did You Know ...

- With standard system and in-house products, Prevas streamlines customers' production processes.
- Prevas' delivery precision, of more than 90 per cent of customer projects being delivered on time, is significantly better than the industry's average.

TECH trends

Technology trends, inspiration and news from Prevas AB.

Prevas is an innovative IT company with a strong corporate culture that provides its customers with world class competitiveness. Prevas develops intelligence in products and industrial systems. Prevas operates in nine districts throughout Sweden: Gothenburg, Helsingborg, Karlstad, Linköping, Lund, Malmo, Stockholm, Uppsala and Västerås, as well as in two districts in Denmark: Copenhagen and Århus, and in one district in Norway: Oslo.

For more information about Prevas, please visit
www.prevas.com

Prevas

Prevas Signs a Framework Contract

Sandvik is a high-technology, engineering group with advanced products and a world-leading position within selected areas.

The framework agreement relates to IT projects and consulting services within the entire Sandvik Group.

– Sandvik has been one of Prevas´ largest industrial customers for many years. We are very pleased to have gotten the opportunity to continue cooperating with a company such as Sandvik. Prevas´ long experience in successful project implementation helps the customer to, in turn, be able to offer competitive world class solutions, says Christer Ramebäck.

– In order to assist our customers in the best possible way, we invest in long-term customer relationships, which also includes having a deep insight into and understanding of our customers´ enterprises," continues Christer Ramebäck, Business Area Manager for Industrial Systems.

New Orders - Traceability Solutions

Prevas has obtained several new orders for the Life Science product Snitcher Medical, a device that simplifies the marking of medical products. More stringent requirements for labeling from the customers of pharmaceutical companies are boosting demand for this product of Prevas. By means of labels containing part number, expiry date, batch number and a serial number, it is hoped that fake medicines will be forced out of circulation.

Snitcher Medial makes the labeling of medicines and medical instruments both simpler and safer.

The product is a flexible print-on-demand system which is able to handle everything from small-scale needs to those imposed by large automated production facilities. Examples of companies using Prevas' Snitcher Medical are ALK-Abelló, AstraZeneca, Cambrex, Fresenius Kabi, Invitrogen, Dynal, GE Healthcare, Nobel BioCare and Phadia.

The Prevas – Invensys Road Show

Together, Prevas and Invensys have visited a number of places in Sweden on its road show. Stefan Eriksson of Invensys presented the latest version of Wonderware's InTouch Human-Machine Interfacing system and Richard Norin of Prevas demoed the software. In addition, the possibilities offered by the System Platform of Wonderware were also shown. This is a platform for the building of automation systems, from small standalone machines to entire factories. In the afternoon, Manufacturing Execution System (MES) was shown and Roger Keller of Prevas explained the benefits that can be derived from investing in MES.

If you, Dear Reader, were unable to attend, please let us know and we would gladly pay you a visit to show System Platform and/or MES.

For more information on InTouch HMI or MES, please contact Roger Keller of Prevas at +46 21 360 19 00 or at roger.keller@prevas.se.

The Steel Industry Saves 110 GWh/Year

Swerea MEFOS is a research institute for the steel and metals industries which many Swedish players are members of, Prevas, included. Membership in MEFOS gives Prevas access to the latest in applied research and top-notch competence in steelmaking with focus on heating and metalworking. In addition, this close cooperation with MEFOS and other member companies provides good insight into the real problems and challenges of customers.

Alongside MEFOS, Prevas is involved in a number of research projects which are managed by The Association of Swedish Steel Makers (Jernkontoret) and financed by The Swedish Energy Agency (Statens Energimyndighet), and The Swedish Applied Research Promotion Agency (Vinnova). In these projects, Prevas' customers play a central role in the provision of competence, practical experience and facilities for practical experiments. Projects targeted at energy savings in the Scandinavian steel industry of at least 110 GWh a year are scheduled for completion in 2011.

TREND

25 Years of Large- and Small-scale Energy Conservation

How can energy consumption be reduced and the emission of greenhouse gases be halted? These are questions posed ever more often. Environmental awareness is one of the dominant trends at Prevas. Over the 25 years of Prevas' existence, the company has delivered know-how and competence to its customers and has a finger in must energy conservation pies, from crane control in waste incineration facilities to design of tomorrow's electronics.

A man who has been in the industry over the entire haul is Christer Ramebäck, Prevas. Christer sees both similarities and differences between then and now:

– Much of what we are trying to achieve still amounts to the same old thing: optimization, efficiency-raising and quality control. The big difference is the tools at our disposal now, which are far more sophisticated and powerful. Instead of basic automation and low-level programming, we now operate on a higher level with more competent, adaptable and combinable modules as tools.

Even if profitability still is the fundamental factor, environmental aspects are becoming more and more prominent in the projects that Prevas participates in. In the last five to ten years, Christer has seen a distinguishable trend among corporate customers that they like to talk about their environment conservation efforts and he notes that Prevas is involved on a broad front in the development of energy-efficient products, more environment-friendly energy production and more energy-efficient industrial processes.

The Steel Industry

An example of improved control having a great environmental impact can be found in the steel industry, which, with its big volumes and many heating processes is very energy-intensive. Consequently, we find here one of Prevas' best established products: FOCS (Furnace Optimization Control System), having a strong position on the Scandinavian market for furnace control.

Robert Majanen, Business Unit Manager at Prevas explains:
– The environmental potential of this product is very big, even if the financial benefits are the most alluring. If a furnace is equipped with a rudimentary control system, we are able to reduce energy consumption by five to ten per cent directly, at the same time as we are able to improve quality and reduce waste.

Now the sight is set on the global market, not least China's, where strong measures are taken to protect the environment and where big sums of money have been set aside for industrial modernization.

Smarter Energy Production at Fortum Högdalen

Also in the production of electricity and heat, it is important to think smartly and put technology to use to reduce production costs and the environmental impact. To Fortum's waste-burning facility at Högdalen, south of Stockholm, Prevas has delivered intelligent control of the overhead gantry cranes handling the waste matter. The refuse is hoisted from a gigantic concrete pit, measuring 10 x 60 meters and put into buffer pockets from where it is fed into the furnace and converted into heat and electricity. Previously, the gantry cranes were controlled manually by operators on a 24-hour basis, the operators having a bird's eye's view of the pit where the refuse collection trucks dump their contents through twelve inlet gates.

The job to automate the cranes went to Prevas where Göran Rundquist, who has solid experience in PLC and SCADA programming, became project manager.

Gentler with Automation

The system is based on a PLC (Programmable Logic Computer, a compact and ruggedized computer for industrial applications) per crane and a master PLC, coordinating the movements of the cranes. Each crane is also equipped with vision in the form of a laser scanner, constantly keeping tabs on the distance down to the refuse surface in the pit. In other words, the system creates a three-dimensional image of the material in the pit, enabling the cranes to move optimally. When a crane is about to move from one point to another, it is able to hover just above the surface instead of making unnecessary lifting and lowering movements, which would cost both time and energy.

A consequence of the automated crane control is that equipment wear has fallen. The need for service has shrunk by half thanks to the more gentle automatic operation. The system is also aware of which type of refuse the trucks offload (there are three grades of refuse with different energy contents) and where in the pit these grades can be found. Due to this, the feeding of fuel to the furnace can be made even, stable and optimized.

Göran Rundquist is satisfied:
– The system operates very well and has been improved during the course of the project. Currently we are looking into replacing the Profibus cabling to the cranes with wireless communications. That would eliminate the problem of mechanical wear, disrupting communications when the cranes move.

Smart Products Drawing Little Current

At the other end of the scale of power consumption, measured in microwatts rather than megawatts, we find today's ubiquitous miniaturized electronics. Here too, Prevas is involved in the reduction of energy consumption in all its product development projects.

Rune Domsten, Technology Manager at Prevas A/S, is keeping tabs on what is going on inside chips and on circuit boards:
– Extremely low power consumption in Stand-by and the shortest possible time in Active mode are goals we always go for, he says. "For this reason, it can pay to go for a radio circuit which is able to manage megabits per second even if there are only some tens of bytes to transmit every time, since we then get away with only a few milliseconds of activity."

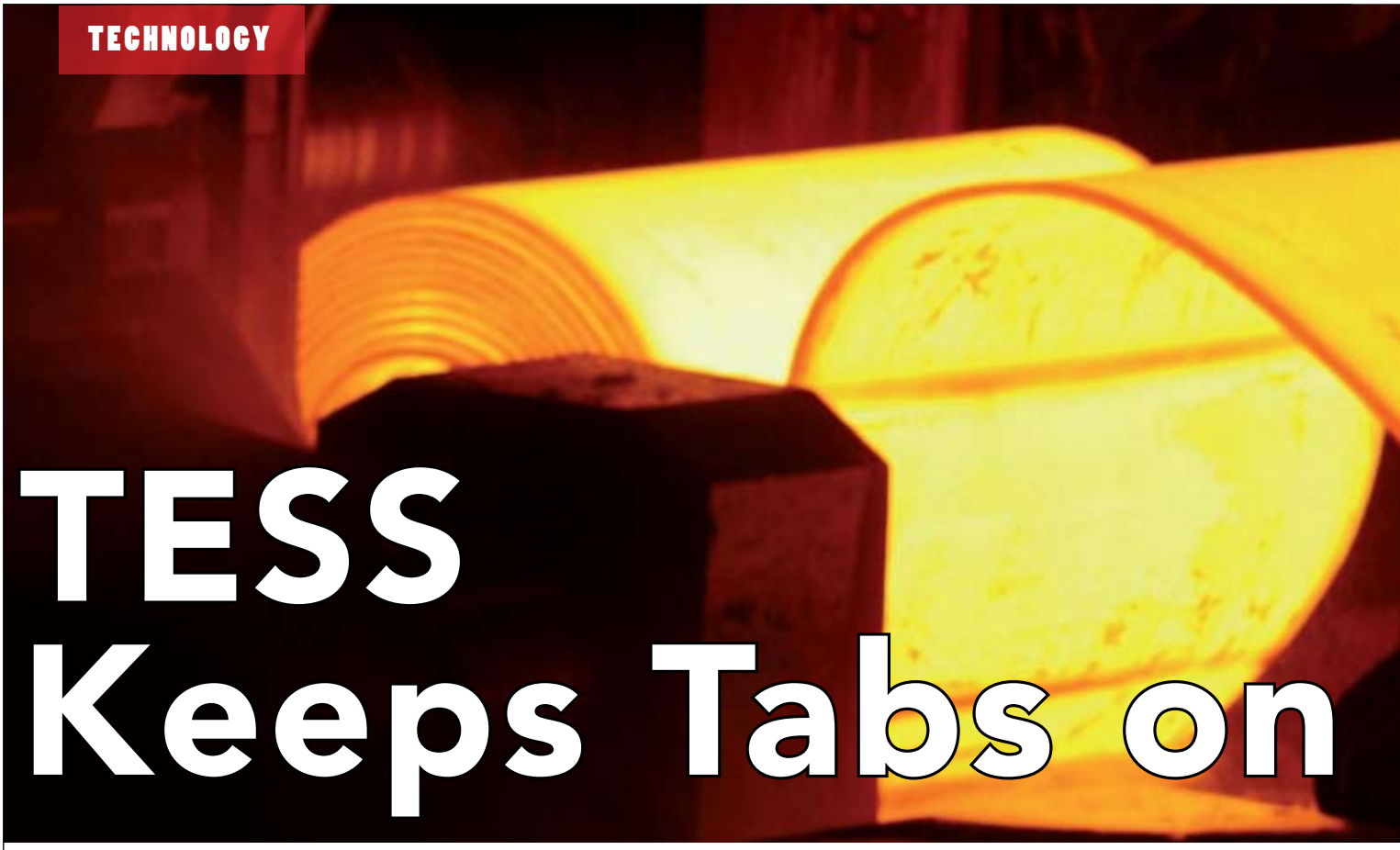
Low Consumption also Means Long Life

In addition to economizing on the use of resources, low power consumption also makes it possible to design small products with very long operational lives. This opens up for many exciting applications. Rune takes one example having relevance now against the backdrop of all the collapsed roofs during the record winter of 2010:
– Sensors in structural elements such as roof beams would be able to raise alarms by radio about deformation or moisture long before the situation gets alarming, he says. "With today's technology, it would be possible to design a small, low-cost, autonomous, sensor with a life expectancy of 25 years."

The Next Twenty-five Years

Despite all progress and the powerful and sophisticated aids already made, there is little risk of Prevas running out of work to do. On the contrary, says Rune, who is convinced that more intelligence in the form of microprocessors will be put into even simple products such as household appliances to increase utility and reduce energy consumption.

Christer Ramebäck agrees:
– There is still an enormous potential, not least when looking at the big picture. IT support systems make it possible to consolidate information from many sources. That is a way to identify new correlations and find new ways of reducing energy consumption and ultimately improve the environment.



TESS Keeps Tabs on

TESS, short for "Temperature Estimation & Supervision System", is a tool, developed by Prevas, for the supervision, control and calibration of temperature sensors in industrial processes. The first market-ready application of the technology is for supervision of thermocouples in heating furnaces in the steel industry where the potential gains of improved temperature control are great.

Making steel is very energy-intensive. Materials are heated and cooled in several cycles for them to acquire the desired properties, e.g. when refining iron ore into pellets, reducing ore into iron, reheating before rolling, annealing or hardening.

A typical heating furnace is some ten meters long, several meters wide and divided into zones where the temperature can be controlled. The steel shapes are put in at the one end, transported through the furnace and taken out at the other, through-heated to a temperature which is suitable for whatever processing that is to follow, e.g. rolling or drawing.

This heating process is a delicate balance between the temperatures of the different zones and the speed at which the steel is pulled through the furnace. The more accurately this process can be controlled, the better the result, the lesser the waste and the lower the energy consumption.

For many years now, Prevas has been delivering its control system FOCS (Furnace Optimization Control System) which is a market leader in its field.

TESS Eliminates Idle Time

FOCS supervises the temperature of the furnace by means of a number of sensors, thermocouples, appropriately positioned in the different zones. That the values obtained from these sensors are correct is of utmost importance for FOCS to work properly.

To raise the quality of input data and detect error sources, Prevas has launched TESS (Temperature Estimation & Supervision System).

TESS is based on practical experience, theoretical mathematics, statistics and programming skills in equal measures. The signals from the thermocouples, e.g. in a steel furnace, co-vary and this co-variance can be described statistically. Simply put, TESS works on the basis of a model, indicating which signal each thermocouple should output at each moment, based on input from the surrounding sensors.

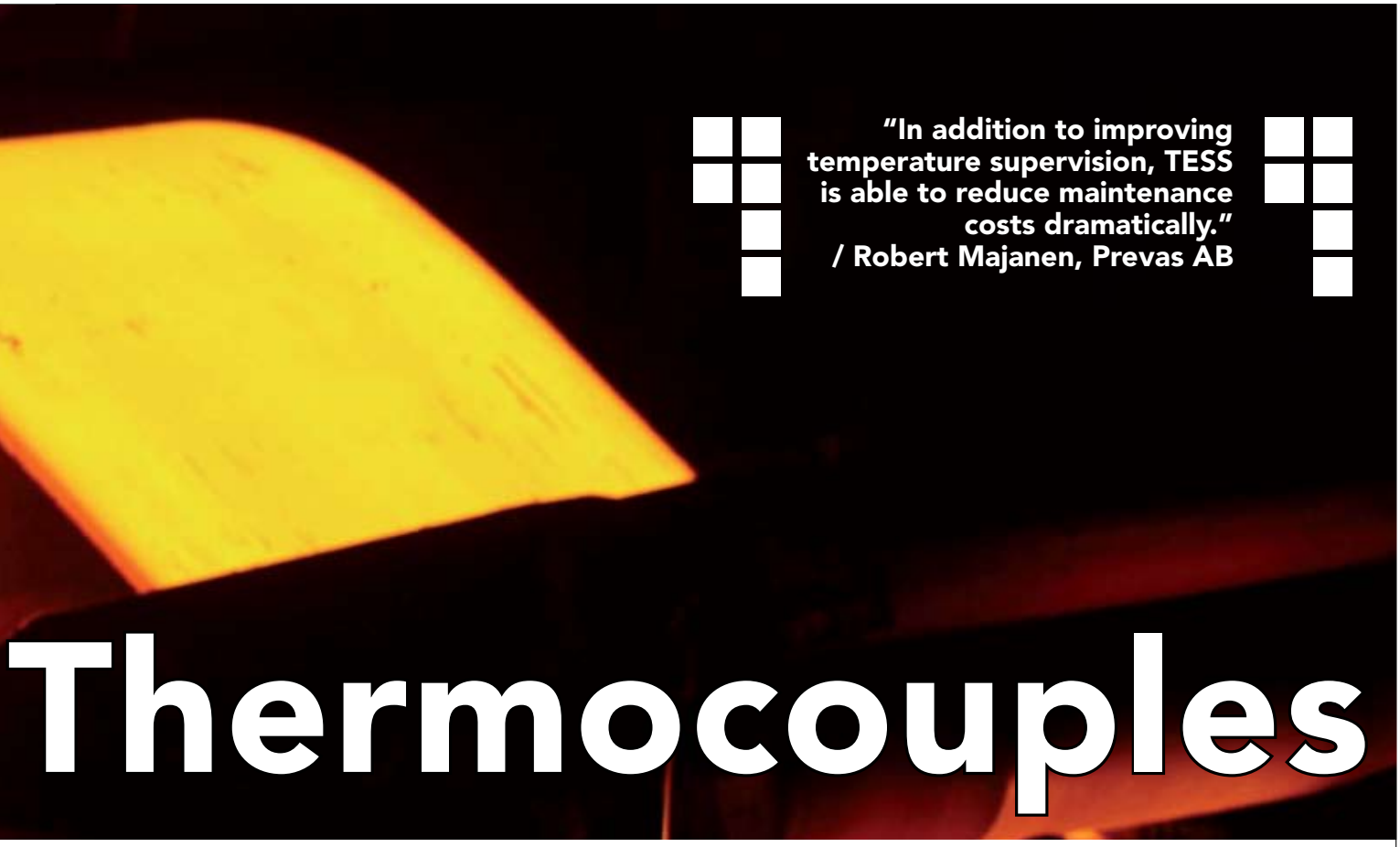
As soon as the model is invalidated by actual measurements, i.e. by the signal from a particular couple deviating from the expected, an alarm is raised to the operator. The signal from the erroneous thermocouple can be recreated by TESS, pending correction of the underlying error. In this way, the furnace is able to continue operating with high precision.

A Supplement to FOCS

TESS constitutes a supplement to FOCS. Like the latter, TESS is very adaptable to the specific needs of each customer and environment.

Each project starts with a preliminary study and continues with a period of model building on the basis of actual production data. It can be said that TESS in this way learns the normal conditions and how the various input signals co-vary.

Multiple models with different combinations of thermocouples can be built and threshold values be determined, beyond which TESS is supposed to raise alarms about errors.



"In addition to improving temperature supervision, TESS is able to reduce maintenance costs dramatically."
/ Robert Majanen, Prevas AB

Thermocouples

The improved temperature data TESS provides are used as one (of many) conditions in FOCS to calculate setpoints for the level 1 systems controlling the heat sources of the furnace, all with the objective of ensuring that the heating of each steel item adheres to the ideal curve as closely as possible for the purpose of achieving maximum quality and productivity.

Reduce Costs

In addition to its sophisticated temperature supervision, TESS is able to reduce the costs of new thermocouples dramatically. During error detection, the standard practice in the steel industry has been to replace all couples of the furnace involved at regular intervals, sometimes as often as four times a year to retain appropriate functionality and precision. If we assume an average cost per couple of US$ 1,400, and some fifty couples per furnace, we are talking significant costs here.

With TESS installed, the works is able to abandon that practice and instead replace only single couples and then only as they fail. Since TESS simplifies the fitting and calibration of new couples, the replacement process itself is also simplified.

Further prospects for money savings can be found in operations subjected to tough demands for verification of heat treatment temperatures during production. Such steel makers often walk around check measuring each couple against a certified master couple. With TESS, such check measuring can be dramatically reduced, leading to reduced costs.

Developed in Fruitful Cooperation with the Industry

An important component in the development of TESS is Prevas' involvement in a number of research projects coordinated by The Association of Swedish Steel Makers (Jernkontoret). The projects are financed by The Swedish Energy Agency (Statens Energimyndighet) and The Swedish Applied Research Promotion Agency (Vinnova) and are executed in cooperation with the industry and the industry's research institute Swerea-MEFOS, of which Prevas is a member.

Prevas gets good insight into the needs of the industry and access to experience, data and trial sites, making it possible to develop products that match the needs of the industry in its continuous efforts to optimize processes, reduce waste and reduce energy consumption.

Obviously, these efforts are global in nature and do not only apply to the steel industry. Consequently, here lies an expanding market for Prevas.

Facts about Thermocouples:

A thermocouple is a type of temperature sensor whose principle of operation is based on the phenomenon that electrical tension arises between the ends of a metal wire if they are at different temperatures. The magnitude of this tension differs between different metals. By combining two wires of different materials and establishing electrical contact between them at the point of measurement, a measurable voltage difference vis-à-vis a reference spot arises.

Thermocouples are available in a number of metal combinations for different temperature ranges. The most common one is Type K, consisting of two conductors, a CHROMEL (a nickel-chrome alloy) one and an ALUMEL (a nickel-aluminum alloy) one.

Source: Wikipedia.org

Contact:

For more information on TESS, please contact Robert Majanen at Prevas at robert.majanen@prevas.se or by phone +46 21 360 19 00.

CASE

Gas Bottles Made of Plastic, a Norwegian Ground-breaking Product

Daimler & Benz call it "fantastic"

Quality and traceability mean everything when Ragasco of Norway makes gas bottles for the consumers and the automotive industry. Production takes place 24 hours a day, meaning that stoppages and rejects pose serious threats to the operation. For this reason, Prevas' data acquisition system keeps tabs on all production parameters.

Ragasco AS at Raufoss, Norway has 110 employees and is a leading player on the European market for the development and manufacture of gas bottles made of a composite of plastic, glass and carbon fiber. The company needed a production reporting system to supervise the quality and efficiency of all stages to achieve traceability and cost-effectiveness in the production process. Prevas was called in and solved the problem with a data acquisition system based on the Wonderware System Platform.

Tom Madsen, CFO at Ragasco explains:
– The Raufoss facility is highly automated and operates day in, day out, year in, year out. It produces approximately 1.4 million bottles a year and customers are gas producers such as Statoil, AGA, BP, etc. The customers are very confident of the quality and trace-back checks made by Prevas' data collection system.

When the plant was opened in 2001, we needed an application to make our products traceable. The authorities requested our knowing where each and every bottle had been made, sold, etc. For this reason, every bottle is given a unique ID number which links to a production log, keeping tabs on where each product currently is in the plant. In addition, the technology is also used to check production at all the stations involved. At every step there are upper and lower limits e.g. for weight and leakage which must not be transgressed for each item to be released for further processing.

Prevas has been with us from the beginning with software and manufacturing logic. We are 100 per cent dependent on the application working. And it does, even if Prevas has been forced to step in a couple of times to check the health of the system.

A portion of Ragasco's bottles are for liquid natural gas (LNG) and for cars propelled by such fuel. One of the customers for these products is Daimler & Benz, who use them in their B Class cars. Plastic bottles are significantly lighter than traditional steel bottles and D & B call the solution "fantastic".

Geir Jåsund, CEO of Prevas Norway continues:
– The authoritative requirements are very tough as are the requirements for traceability. We have built a system on standard modules which in turn are based on the Wonderware System Platform from Invensys Operations Management. This is a product family which is frequently found in the manufacturing and processing industries for operations control.

Morten Becker Eriksen, systems developer at Prevas Oslo has developed the entire system in Wonderware:
– The system is almost exclusively used for data capture and the production data for each bottle must be approved for it to be released. The bottles are tested for leakage at several stations and lit through by camera for elimination of internal flaws. So far, the application has been run on three older servers but right at this time we are replacing them with two new ones which are to operate in a dually redundant configuration to keep production up. In addition, reporting and web services are run on a third server.

– Prevas has been very accommodating any time of the day or night. They perform well and have lived up to all our requirements. They have solved our problems well and been a supplier we have been able to trust during the ten years we have cooperated, finalizes Madsen.

Read more at www.ragasco.com.

Prevas