ŠTOREQSTEEL 2017 » 2021

Internal information magazine, No. 1 - 17

Cost efficiency and adaptability

Štore Steel is a mini steel company that is why we are oriented into market niches, where we are competitive with modified steels made to order and short delivery times. Our cost efficiency and adaptability are of extreme importance to offer our products at acceptable prices.

When planning procedures we are trying to replicate the efficiency of serial production. This is in the steelworks casting in sequences, in the rolling mill sequence of the rolling programme and in cold finishing logistics of processing procedure sequences.

All our investments are chosen to achieve better cost efficiency (higher productivity, lower operating costs) along with quality, humanisation of work, environmental protection.... Beside modernisation, we are moving to gradual automation of processes that present competitive advantage. The first robot was introduced into cold finishing production in 2005. This was a simple magnetic manipulator and today we are using further two for stacking of sawed material.

One of our competitive advantages is the offer of steels with improved machinability, which also enables our clients to optimise and increase efficiency, as is described by one of our business partners in this issue of the magazine.

We believe and we are convinced that our employees are the ones, who can contribute most to better efficiency and productivity. We have used different tools (surveys, testing and workshops) to form a set of values, which are to follow our work, relations and communication among the employees to increase their enthusiasm.

Ivan Jurkošek, Managing director

On the cover: additional processing of half axles - centralization; photo above: Minister Počivalšek with company management in the control room of the rolling line.

Made to order production planning

The company Štore Steel manufactures its products to order. Regular clients ensure their annual quantities by contracts, monthly orders with more detailed specification are placed every month according to current needs.

Occasional purchasers can place their orders in the same way – until our monthly capacities are full.
This is possible due to the company's regular monthly production cycle, where the whole range of products is manufactured regarding type of steel, form and dimension. Manufacturing documentation for the production line is prepared according to customer's needs. Technology, rolling schedule and delivery time as well as technical approvals that will accompany the product are defined.
In case of more demanding enquiries, a development technological team makes a decision whether or not to take the order.

Made to order production can be extremely costly, that is why we use approaches at production planning and at organisation of individual stages of production processes to find cost efficiency that can be achieved in serial production only.
Billet stock in the intermediate depot between the Steelworks and Rolling mill are basis for position planning in a certain rolling programme. A casting programme is created according to billet demand. Taken billets are then with help of information system planned to an individual position of order confirmation.
At casting, a special care must be taken of the charge order and quality respectively (new ladle) and not only of the rolling programme.

To reduce the costs at the steelworks, it is necessary to make an optimal casting programme by increasing the number of sequences, if rolling allows that of course. By increasing the number of sequences, we increase productivity, improve yield (of the first and last billet), reduce steel manufacturing time EOP and achieve savings on fire resistant materials. Both the technologist in charge and the production-planning technologist consult on daily basis technologists in the Steelworks on casting order, controlled cooling and number of sequences.

Andreja Gril, Head of production planning

Photo above: rolling line storage

Consulting for machining process optimisation

Ralf Schaaf, managing director of Econsteel GmbH and his colleagues have over 25 years of experience in steel industry and with users of steel in machining industry. Econsteel consults with machining process optimisation particularly from the standpoint of material consumption, manufacturing technologies and logistics, which are demanded by present day state-of-the-art supplying industry.

Mr. Schaaf, where in Germany are you located and what area does your company cover?
The company's headquarters is in Rottweil in Southern Germany, our major clients are located between Frankfurt and Southern Bavaria, and we are most active in the Schwarzwald-Baar-Heuberg region and in the surroundings of Stuttgart. However, we have important clients all over Germany and Europe.

How does Econsteel operate and why do you consider having a special approach in the market?
Our procedure of operating and consulting in the market is comprised of several steps.
We analyse the components and manufacturing processes first and perform a cost analysis.
By a well thought-out project management, we choose the materials or optimise a material solution that is appropriate for serial production and define its strengths.
Econsteel assists in the testing and as well as in the market introduction of the optimized steels SOP (start of Production).
The next step and the final goal is to achieve a complete process optimisation with reduced costs to give our client a clear advantage in the market. We are herewith partners with our clients at know-how and added value.

We very often collaborate with the original equipment manufacturer (OEM) or the Tier 1 company in the development stage at the right selection of the materials. By our know-how we add to cost savings of our clients and the whole supplying chain.

Photo above: Mr. Schaaf and his colleagues

You purchase steel at Štore Steel, what is the partnership with our company like?
Besides consulting with manufacturing process optimisation, we are mostly a supplier of innovative high-quality econPRO – EXEM steels. These are special steels manufactured according to specific client demands such as high degree of machining or high degree of purity.

Štore Steel is our number one strategic partner with a very long, close and intensive collaboration.
At Štore Steel we mostly purchase optimised steels. We have developed an econPRO-EXEM brand in the field of high-quality steels, which we use exclusively to market steels from Štore Steel.

Partnership in development with Štore Steel is unique and very efficient. The collaboration, we have developed in the recent years, has developed very well and is still expanding mostly due to continuous support to the factory. The collaboration has continuously intensified and improved particularly due to close collaboration with management members Jani Jurkošek and Miran Prezelj. Jani Jurkošek and Miran Prezelj are the ones who have early recognised possibilities of Econsteela and have realised our appeals for better recognisability and stronger position of Štore Steel in the German market. Especially in the times of saving and globalisation of steel industry, we see the company Štore Steel as a strategic partner for the market niche we represent in Germany.

What are your advantages for the clients that collaborate with you?

Econsteel is not only a supplying and consulting company. By a complete service package, we enable our clients to create higher added value in Germany and Europe. By a well thought-out management of the suppy chain in close collaboration with Štore Steel – from short delivery times, small series to a net of regional econsteel warehouses – we can supply our customers with wanted materials at any time and any place.

Econsteel received in 2016 an award from the state Baden-Württemberg (Southern Germany) for the most innovative company in the whole branch (steel industry).

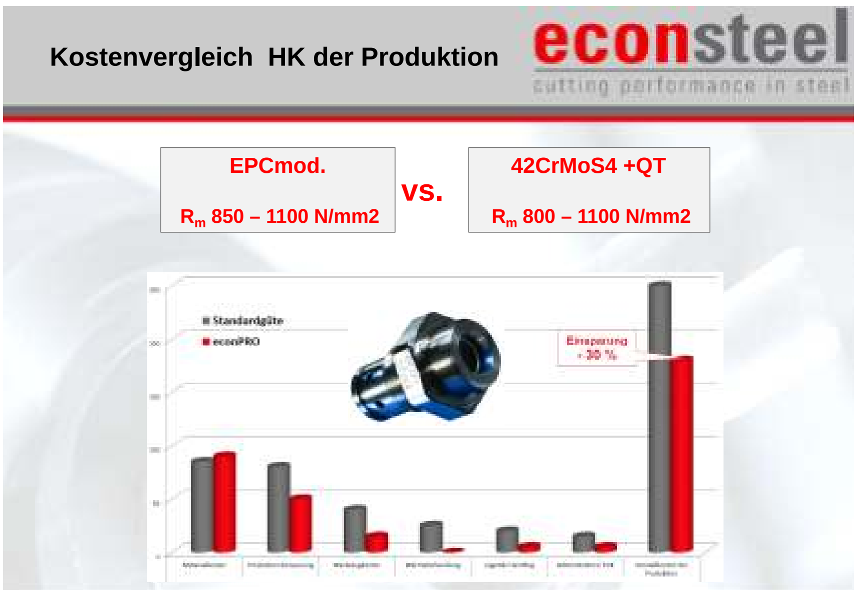
Which branches and fields do you supply, who are your clients?

Our clients are mostly original equipment manufacturers (OEM) and Tier 1 companies for the automotive industry, mechanical engineering and industrial equipment, gearbox and drive technology, companies in the field of medical and environmental technology, air and space transport, electrical and printing industry.

What are your future plans?

Currently we are planning an expansion by building a Steel Service Center with technology centre.
The new office building will be a logistics centre and a place to work with clients who visit us to discuss their new projects or optimisations.

We are also planning to harmonize now branched processes and to increase flexibility and improve quality. That has always been a demand of our clients at audits and which will now be completely fulfilled.



Cost efficiency calculation example

Cost savings for a complex and highly machined component are approximately 30 %.

A process was planned for conventional steel: soft machining, turning, milling and drilling; heat treatment – quenching; post processing;

By optimising the material and replace conventional 42CrMoS4 steel by EPCmod - 38MnVS6mod-EXEM steel.

The savings are achieved by better machining/takt time reduction; reduced tool cost; heat treatment – quenching is not necessary.

Photo above: new „Steel Service Center“

Values of the company

There is a great variety in the generation profile of our company and teams are also mixed. Collaboration and connection among the employees are of great importance for successful work. There is existing knowledge and experiences that are confronted with new views brought by younger generations. How to create good relationship and communication among different generations is a question that arises more and more often.

Which values will support and guide the leaders and employees to know what is desired and what not when fulfilling the vision of the company. And on the other side, what are the values that will be adopted by the youngest and the oldest employees?

In the beginning of this year, we started to reform organisational values. We defined six key values that reflect our organisational culture and which at the same time correlate with the strategy and goals of our company.

We formed a set of values and described them with actions that are essential for the success of the company in the future. An updated list of values was created with a project group of key co-workers from all plants and services of the company and confirmed in two focus groups of randomly chosen co-workers. Two larger workshops are to follow with the goal of communication and integration of the newly defined values. Each of the values is described by a range of behaviours that are desired, expected and of course appreciated in our company.

Values are worth a lot, since they represent a guide and a kind of compass for our actions. The most successful organisations are those where the behaviour of their employees is harmonized with the strategic goals, values and organisational culture. We believe that values of the Štore Steel company are in accordance with your personal values and beliefs.

Marija Lukež, Human resources management

»Values represent basic priorities of an organisation culture. There are beliefs what is appreciated by an organisation and its individuals, what they value as positive, desired and worth the effort. They are conscious expressions of what the company stands up for, a kind of deeper inner compass, which directs actions and behaviour of the organisation and its people and which strengthens the understanding of what is important, what is worth fighting for and standing up for.«
Institute for Ethics and Values

1 Professional competence: knowledge, innovation, continuity of learning and changing.

Personal and professional development. Learning organisation. Competence. Experiences. Unselfish transfer of knowledge to younger members of staff through intergenerational collaboration. Investments into employees' development and knowledge. Continuous giving of initiatives and ideas. Strategic control of changes. Continuous development and innovation of products, services and processes.

2 Teamwork: spirit of collaboration, good relationships and sincerity.

Submitting individual interests to team and company interests. Intergenerational collaboration. Co-dependence. Personal enthusiasm. Loyalty. Constructive problem solving. Equivalence, unity and equality among members. Trust. Collaboration among departments. Mutual commitment and loyalty. Positive attitude and energy, not criticizing and searching of blame and offenders, but searching of solutions.

3 Responsibility to everyone.

Optimal relationships to everyone in the company. Self-initiative. Strategic management of relationships to everyone and achieving an optimal compromise between objectively different and conflicting interests of everyone in the company. To keep word and promises and to respect agreements. Responsible commitment to the profession and company. To abide the codes and jointly accepted rules. Independence, self-responsibility, accepting responsibility. Special responsibility of leaders for respectful treatment of employees.

4 Environmental treatment and continual development.

Integral management of all environmental issues. Special emphasis to environmental relationship with the local community. Complying with ergonomic standards and norms. Good and safe working conditions. Regulated collection and separation of waste. Adequate reporting on environmental issues. Fulfilling social responsibility standards.

5 Ethic actions and decisions.

Professional actions and attitude. Surpassing legal norms. Complying with and live the society's values. Respecting the agreed. Accepting responsibility for one's own actions and decisions. Exposing personal responsibility. Being bound to professional ethics and professional norms. Integrity, clarity and conformity in business. Setting an example to others. Courageous and independent thinking.

Q Quality and excellence as a guide for everything we do.

Striving for standards of excellence. Proactive actions. Proactive and fast response to errors and deviation from the agreed upon. Continual search of opportunities to improve products, services and processes. Complying with all quality standards.

A Robot in Cold Finishing

Automation and indirectly robotisation of the production process is a goal of every company. When talking about robotisation, we do not only think of higher quality and productivity, but of protection of employees from dangerous exposure at the place of work (physical efforts, carrying burdens, places of work harmful to health, actions with repeating moves...).

All the above dictated development of automation and robotisation not only in automobile and metals processing industry, but also in pharmacy, catering industry, medicine and household. Robotisation has actually made way into every field of our lives.

What is a robot?

A robot is a machine that humans can control by a computer. Humans direct the computer that sends commands to the robot and it carries them out as tasks. The robot "thinks and acts" with help of a computer. This way, the robot performs a certain task or more independently and without human intervention.

History of the term »robot« goes back to year 1921, when the Czech writer Karel ČAPEK, wrote a play Universal Robots. The word robot has Czech origin and derives from the Czech word for forced labour of a robot (slave). The word has been since used to name a machine that carries out labour to help humans. A pioneer in the field of classical robotics was George Devol. He invented the first programmable robot that was intended to handle raw materials. Until 1967, the use of robots was limited mostly to the USA, mostly in the company General Motors. In 1967, the first robot was installed in Europe too. Robots were mostly used for welding in automotive industry. Quick development of robots followed in all industrial branches and elsewhere. Well-known robot manufacturers today are Motoman (Yaskawa), ABB, Fanuc, Epson, Panasonic, Kuka, Staubli, Kawasaki, Mitshubishi, Honda. However, there are other smaller specialised companies too.

Photo above: Yaskawa robot

In the Cold Finisihing plant, we are trying to follow process automation to provide easier and simpler work (removal of physical labour) on one side and on the other to increase productivity. The “first robot” was implemented already in 2005. That was a magnetic »MANIPULATOR« for stacking of sawed flat steel into packages. In this way, physical stacking was eliminated and sawing productivity increased. The existing manipulator is still in operation, but it now carries sawed flat bars at the drill and stacks them into packages. Due to insufficient sawing capacities of flat steel, we invested in 2007 and 2008 in two more circular saws. They were equipped with a robot for stacking bars into packages from both saws. That way, we substantially increased the sawing capacities and completely eliminated physical stacking. The manufacturer of the second robot was the company ABB.

Continual development of additional processing forced us to invest in the first circular saw for sawing peeled steel for half axles in 2006. Orders for sawing peeled steel (half axles mostly) were increasing and they still are. That is why we purchased another saw in 2009 and this year the third circular saw from the same manufacturer SIMEC from Italy. We have decided to equip the third saw with a robot to increase sawing productivity - particularly stacking bars into containers. We have chosen a robot made by a Japanese company YASKAWA, for which all the projects (for Western Europe) are carried out by a daughter company YASKAWA from Ribnica. The main purpose of the robot is to carry the sawed bars directly into the container. This carrying is at the previous two saws performed by a crane.

Photo - above left: magnetic manipulator; above right: ABB robot

The robotic cell is designed not to stop when containers are being replaced (empty for full). The robotic cell is based on a 6-axis industrial robot Motoman type MH50II (with 50 kg payload and horizontal reach R=2061mm) and the DX200 controller. The robot is equipped with two pneumatic grippers with two fingers for picking two bars at the time; total weight of bars is 8kg. Positions of the gripping fingers are detected by sensors (open/close) and the presence of the bar in the gripper is sensed too.

The saw and the robot function absolutely synchronously and automatically. The saw and the robotic cell communicate over Ethernet. The robot program is designed to accept from the saw and robot operator the following data to the teachbox: bar length, bar diameter, container type and number of bars in the order.

Based on these data the saw and robot start to execute each its own function and the process of sawing and stacking bars starts to run automatically.

Alojz Gajšek, Head of Cold Finnishing Plant

Interior Inspection Line Upgraded

Before introduction of the Automated Inspection Line (AIL) in the Rolling mill, rod steel had been tested in Štore by crushing tests and visually by two Feroflux units and a manual UV unit. In 2000 there was in then Inexa Štore an AIL for automatic non-destructive inspection of round bar steel installed.

Beside surface inspection and against mixing there was an ultrasonic device for steel interior inspection by a German manufacturer Krautkramer (now Ge Inspection & Technologies) installed. The device enabled inspection of rolled pieces interior at core and its immediate proximity only. Depending on the bar diameter, the coverage of the cross-section was between 40% and 60%, which was then satisfactory for all our clients.

Štore Steel d.o.o. is oriented particularly in improvements of technological processes and production of high-quality steel on clients' orders. This is the reason why we planned in the following years an investment in an additional AIL with ultrasonic inspection of rolled rods at core as well as immediately under the surface and which will ensure a 100% coverage of rolled pieces cross-section.

Just before the end of 2016, one of our clients conditioned increase in orders as well as keeping the present ones by having in May 2017 a device, which would enable inspection with 100% coverage of rolled pieces cross-section, installed. Therefore, the company management reached a decision to immediately purchase one. The plan was clear. To find, order, install and start a new ultrasonic device in a relatively short time and replace the old one by Krautkramer.

Delivery times for such new devices are at least 10 – 12 months. That is why we searched for shorter delivery times with used equipment. The only supplier that was able to do that was the American company Magnetic Analysis Corporation (MAC). They offered us a used and refurbished rotating ultrasonic device with a 3-month delivery time, which we accepted. Because it was larger than the old one, the test bench also had to be replaced. That meant that all other devices had to be moved from the old to the new test bench too (mixing, surface and dimension inspection).

Photo above: upgraded inspection line

Preparation and technical coordination were going on from January to April 2017. In April, the device was set, installed and started; operators were trained and the new ultrasonic device was tested. At the same time, the inlet manipulation part of the AIL was replaced due to wear and tear. The new ultrasonic device started its trial run at the beginning of May.

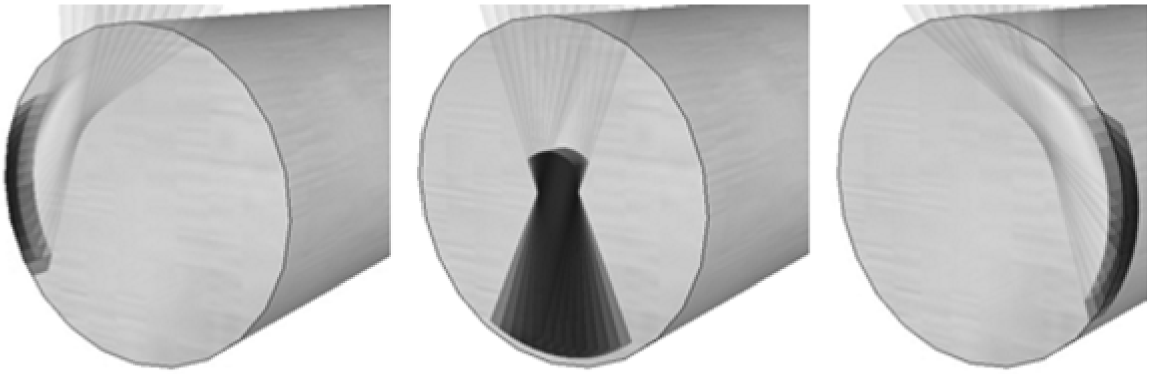
The essence of the technology that enables inspection of bars immediately under the surface is shown in the bottom image. It is about a combination of ultrasonic rays the device radiates: rays perpendicular to bar surface, rays at an angle clockwise and anticlockwise rays.

The innovation are ultrasonic rays that probes radiate at an angle and insure inspection of bars immediately under the surface. The rotating head enables turning of probes and contact medium (water) while the bar moves through it.

The first results show achievability of extreme sensitivity and accuracy of the device, which will be set and used according to clients' demands.

Mastering the upgraded ultrasonic technology was no real challenge for our receptive and competent operators.

Čedomir Minić, Head of the Rolling Mill



Above: Schematic presentation of 100 % coverage of bar cross-section by ultrasonic rays; Below: Rotating MAC ultrasonic device

New layout of the iron-making collection

ŠTORE ON THE TRAIL OF IRON CULTURE

At the museum, we presented in April 2017 a new permanent exhibition of the iron-making collection » ŠTORE ON THE TRAIL OF IRON CULTURE «. Since 2004, when we opened the Štore Iron-making Museum, we have re-explored the history of iron-making in our area and have discovered many new facts we wanted to present to the public.

Many documents, photographs and exhibit pieces were contributed by former and present employees of the ironworks as well as citizens. The museum is growing to a place of collective memory that is being created and integrated into our iron-making story.

At the time of the turn from the 19th to the 20th century, Štore was changing to an important industrial centre. Mining and iron-making were the two sectors of economy that mostly characterised this area.
The beginnings of iron production in Štore date back to the middle of the 19th century, when the towns Maribor, Celje and Ljubljana had already been connected by the iron road to Graz, Vienna and Trieste. The influence of the industrial revolution brought numerous technological innovations and modernisations of plants, which enabled an increase of iron production and iron products and which made coal an important source of energy.

The collection is designed in chronological and thematic order. Very diverse materials are displayed: plans, photographs, individual exhibit pieces, documentary films, catalogues and archive documentation of companies, documents and various materials from the start of the ironworks in 1850 to the present days.

When examining the historical facts we find out that the ironworks was for those days technologically advanced from the early start in 1850. Already in 1860, it was written in development of metallurgic technology as a beginner of secondary material use by a Lang-Frey method of reduction of puddling and welding slag, which were side products at steel production. From the turn of the 19th century to the end of WW2, it was a part of big European capital, which was beneficial for its business success.

Photo above: Opening of "Štore on the Trail of Iron Culture" permanent ironmaking collection , April 2017

The exhibition is divided into 16 thematic areas:

BEGINNINGS OF IRON-MAKING since 1850, when the ironworks was technologically advanced for those days. Already in 1860, it was written in development of metallurgic technology as a beginner of secondary material use by a Lang-Frey method of reduction of puddling and welding slag, which were side products at steel production.

ŠTORE MINE, which started in 1819, was the fundamental energy source for the operation of the ironworks. It was closed in 1926.

DESCRIPTION OF IRON-MAKING FROM THE TURN OF THE 19TH CENTURY TO THE END OF WW2, when it was a part of big European capital, which was beneficial for its business success.

IRON-MAKING AFTER WW2, when Štore Ironworks became one of the three iron-making centres in Slovenia.

IRONWORKS IN INDEPENDENT SLOVENIA
Years of independence are the turning point in the history of Slovenian economy and Štore Ironworks as well. The Yugoslav market was gone and steel production was halved, which was followed by reorganisation and privatisation of companies. Independent companies emerged that continue the Štore iron-making tradition.

WORKERS' SELF-MANAGEMENT IN THE IRONWORKS
By the introduction of self-management, companies got the right to independently decide what and in what way they produce, to whom they sell their products, where to purchase the raw materials and means of production. The role and method of economic planning started to change too. The self-management era ended in 1991 by privatisation of companies.

RAILWAY TRANSPORT IN THE IRONWORKS, where standard-gauge railway and narrow-gauge transport are presented together with their technological development from the beginning to the present days.

FIRECLAY FACTORY
The Count of Montecuccoli, who originated from an Italian family, built in 1879 a fireclay brick factory somewhat higher from the ironworks. The factory started production in 1880. In 1948, it was merged with Štore Ironworks, where it ran until 1973.

TOWN OF ŠTORE PRESENTATION
The region of present-day Štore was a distinctly agrarian area in the first half of the 19th century. With the arrival of the Southern Railway in 1849 and development of industry after 1850 the town changed considerably, individual areas were industrialised and some became more urban.

Photo above: Mr. Miran Jurkošek, Štore mayor, opening the exhibition
Photo below: Stanko and Marija Vengust, owners of the oldest known photograph from 1890 showing Labour Day Festivities in Teharje, standing in front of their photograph. To their right Slavica Glavan, museum manager and Dr. Karla Oder

Museum published a book called Štore on Old Postcards, where 39 most beautiful old postcards are presented.

LIVING IN AN INDUSTRIAL TOWN
The changed image of Štore was a consequence of hundreds of years of land use, territorial progress and settlement changes. Industry was the main factor for these changes. The town got a look of a typical industrial settlement. The life changed heavily, number of inhabitants grew. The industrial function of the town was expanded to culture, education, health, transport, trading and catering business. Iron industry was the leading activity that accelerated emergence and development of other activities.

WORKERS' FLATS
At the beginning, the Ironworks bought farms, where it built flats for workers next to production plants. In the first period, the company used farmhouses for workers' dwellings and later built new ones. After WW2 housing estate, Lipa was built due to increased number of employees in the factory.

DEVELOPMENT OF PRIMARY EDUCATION AND METALLURGIC INDUSTRIAL SCHOOL was all the time closely connected to the development of the ironworks.

SPORT and sports activities in the industrial town from the beginnings in the thirties of the previous century to the present day.

BRASS BAND
As it can be seen from the documents, the brass band music is at least 110 years old in Štore however, the beginnings probably reach way back in history. It has gone through many organisational changes. The band still plays successfully and spreads the good name of the band across the Slovenian borders too. It takes part at international festivals and performs at other events.

LIFE IN SOCIETIES AND CULTURE, which started to develop after WW1. The Workers' Cultural and Educational Society was the initiator of cultural events in the town and the first Slovenian educational society in Štore. A milestone in the development of cultural activities in Štore was of course the gala opening of the new “Dom Svobode” cultural centre on December 19, 1953 with a large hall and accompanying areas, where there is still rich and fruitful cultural life.

FIREFIGHTING
Firefighting was not organised before WW2. In 1945, the fire department was founded, which still exists nowadays and collaborates closely with all organisations and societies in Štore.

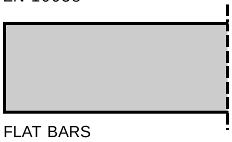
IMPORTANT PEOPLE, who ran the ironworks until the end of WW2

At the opening of the updated museum, we opened an exhibition on Labour Day festivities among miners and ironworkers named “Živel 1. maj! Živel praznik dela!” Six Slovenian museums, guardians of the mining and iron-making cultural heritage as well as working class heritage, collaborated at the exhibition: Carinthian Regional Museum, Ravne na Koroškem Museum, Gornjesavski muzej Jesenice, Mestni muzej Idrija, Velenje Museum, Zasavski muzej Trbovlje and Iron-making Museum Štore. The initiative was given by the Slovenian Trail of Iron Culture Society, which has been connecting Slovenian museums, institutions and individuals for the last 15 years. Its goal is to protect, preserve and present the iron culture heritage. The society connects with similar institutions in Central Europe for fulfilling its mission.

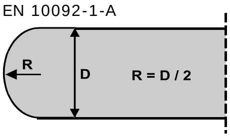
Slavica Glavan, Ironworks Museum manager

CROSS-SECTION SHAPES

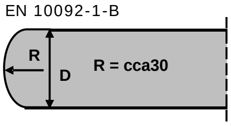
FLAT BARS WITH SHARP EDGES
EN 10058



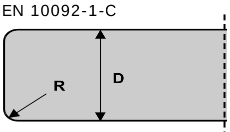
FLAT BARS
EN 10092-1-A



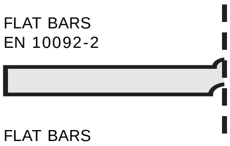
FLAT BARS
EN 10092-1-B



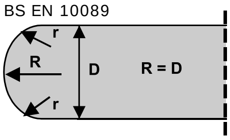
FLAT BARS
EN 10092-1-C



FLAT BARS
EN 10092-2



FLAT BARS
BS EN 10089

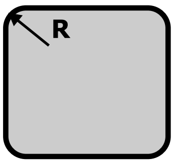


SPRING STEEL:
EN 10089: 51CrV4, 52CrMoV4, 56SiCr7, 56Si7, 61SiCr7, 55Cr3
WNr.:1.5025: 51Si7
WNr.:1.7792: 58CrMoV4

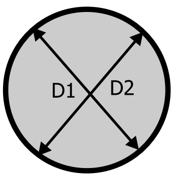
ENGINEERING STEEL:
Forging steel:
EN 10025-2: S355J2, S235JR
EN 10083-2:od C22R, C35R, C40R, C45R, C50R, C55R, C60R
EN 10084: 16MnCr(S)5, 20MoCr(S)5, 20MnCr(S)5
EN 10083-3: 30MnB5, 25CrMo(S)4, 34CrMo(S)4, 42CrMo(S)4,
DIN 17350: 31CrV3, 51CrV4
Carbon steel – for case – hardening:
EN 10084: C10E, C15E, C10R, C15R
Alloyed steel - for case – hardening:
EN 10084: 17Cr3, 16MnCr5, 20MnCr5, 18CrMo4, 20MoCr4, 17CrNi6-6, 20NiCrMo2-2, 18CrNiMo7-6
Carbon steel – for hardening and tempering:
EN 10083-2: C22E, C35E, C45E, C55E, C50E, C60E
Alloyed steel - for hardening and tempering:
EN 10083-3: 30CrNiMo8, 34CrNiMo6, 34Cr4, 41Cr4, 25CrMo4, 34CrMo4, 42CrMo4, 50CrMo4, 51CrV4
Structural steel:
EN 10025-2: S235JR, S275JR, S355J2, E295, E335, E360,
Steel for welded chains:
DIN 17115: 27MnSi5, 20NiCrMo2, 23MnNiMoCr54
Steel for cold forging:
EN 10263: C4C, 17Cr3, 17CrNi6-6, 18CrMoS4, 34CrNiMo4, 20NiCrMoS2-2,
38Cr2, 34Cr4, 37Cr4, 41Cr4, 16MnCrS5, 20MnCrS5, 25CrMo4, 34CrMo4, 22B2
Alloyed steel:
WNr.:1.5231: 38Cr4
EN 10083-3: 30CrNiMo8, 34CrNiMo6, 34CrS4, 37CrS4, 41CrS4, 25CrMoS4, 34CrMoS4, 42CrMoS4, 50CrMo4, 51CrV4
EN 10085: 31CrMoV9
Structural steel for housings of bearings:
DIN EN ISO 683-17: 100Cr6, 100CrMnSi6-4
Steel for heavy duty automotive parts:
WNr.:1.5231: 38MnVS5
VW-TL 1427: 27MnSiVS6, 27MnSiVS6+Ti, 30MnSiVS6
VW-500-30: 36MnVS4, 70MnVS4, 46MnVS5

EXEM STEEL WITH IMPROVED MACHINABILITY:
po WNr.: 20MnV6 EX, 38MnVS6 EX, 30MnB4+Ti EX
EN 10084: C15R EX, 16MnCrS5 EX, 20NiCrMoS2-2 EX, 20MnCrS5 EX,
EN 10084 in UNI 7846:16CrNi4 EX,
EN 10025-2: S235JR EX, S355J2 EX,
EN 10083-2: C22R EX, C35R EX, C40R EX, C45R EX,
EN 10083-3: 25CrMo4 EX, 41CrS4 EX, 42CrMoS4 EX
UNI 7845: 39NiCrMo3 EX,
UNI 7846: 18NiCrMo5 EX,

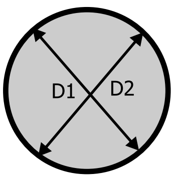
SQUARE BARS
WITH ROUND EDGES
EN 10059



ROUND BARS
EN 10060



BRIGHT ROUND BARS
EN 10278



SQUARE

Dimension mm	Radius mm
40 x 40	6
45 x 45	6
50 x 50	6
55 x 55	8
60 x 60	10
65 x 65	10
70 x 70	10

FLAT

Standard	Dimensions mm
EN 10058	50-200 x 8-62
EN 10092-1-A	60-150 x 8-36
EN 10092-1-B	50-200 x 8-35
EN 10092-1-C	60-120 x 14-67
EN 10092-2	120 x 12-20
BS EN 10089	60-120 x 27-42

ROUND

Standard	Diameter / Process
EN 10060	20–68, 70, 72, 73, 75, 77, 78, 80, 82, 83, 85, 90, 95, 100, 105 mm / rolled
EN 10278 (h11)	18–105 mm / peeled
EN 10278 (h9)	18–100 mm / peeled

ISO 9001
ISO 14001
OHSAS 18001
BUREAU VERITAS Certification
N° 214241 / N° 221243 / N° 224323

ISO/TS 16949
BUREAU VERITAS Certification
N° SLO - 16561/TS

ISO/TS 16949
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OHSAS 18001
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extreme
machinability

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