PRONAR

NR 1/2018

NEW

PRONAR MBA 4512g COMPOST TURNER

p. 28

PRONAR

LEADING MANUFACTURER OF MUNICIPAL AND RECYCLING MACHINERY

WHAT?

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THE LARGEST **RECYCLING FAIR** IN EASTERN EUROPE

23-25.10.2018, Poznań

WHERE?

POZNAŃ INTERNATIONAL FAIR

POL ECO SYSTEM

Międzynarodowe Targi Poznańskie

polecosystem.pl

WHEN?

23-24.10.2018	9:00 - 17:00
25.10.2018	9:00 - 16:00

PRONAR LOCATION

HALL 7A
STAND 20

PRONAR NEW RELEASES

MOBILE HIGH SPEED SHREDDER

MOBILE SLOW-SPEED SHREDDER

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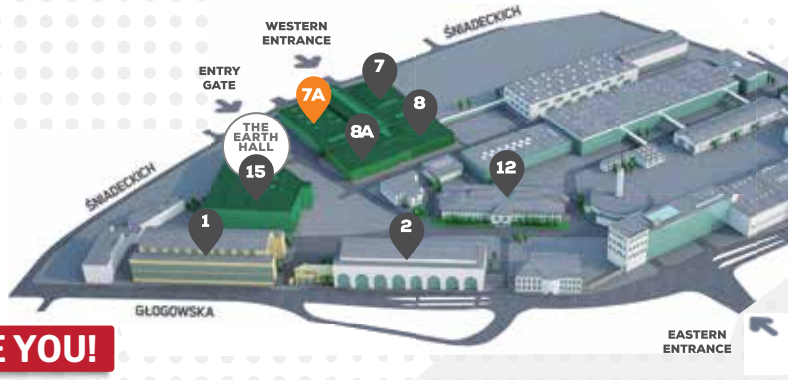

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WE INVITE YOU!

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30 years ago, when my partners Roman Omelianiuk and Jan Czerniakiewicz and I decided to set up our own company, we adopted a strategy that turned out to be very effective. It is reflected in the Pronar logo, which presents vectors branching in different directions. That's how we wanted to represent our way of thinking – that for the company to be stable, it has to be active in many areas, because when one area faces difficulties, we can count on the others. The strategy has appeared to be successful.

The name of the company, Pronar, also represents our approach to business. "Pro" stands for production, and "nar" stands for Narew – the town where we are located. This shows that the value we place on both Pronar's principal – but not only – area of business, production, and that we maintain close relations with the local community. From the very beginning, significant element of our mission has been to provide state-of-the-art, functional but also affordable machinery to farms, regardless of their size or production profile. As the company developed, we appreciated the role of ecology in the contemporary world, expanding our offer to include equipment for environmental protection and cleaning municipal infrastructure.

Thanks to the efforts and persistence of our owners, supported by management and employees, today, after 30 years, we have seven factories and employ 2,200 people. We manufacture a wide range of products, including agricultural, municipal, and recycling machinery, trailers, disk wheels, side profiles, power hydraulic components, wheel sets, axles, and plastic goods.

We continuously develop our products with innovative solutions not previously used by other manufacturers. This gives us the ability to compete effectively in many markets and across many product segments. To make it all possible, we created a strong intellectual base to support our production activities (which I consider our greatest success). In our Research & Development Centre, Implementation Department, and production departments we employ several hundred engineers who develop technical concepts into commercially successful products. The unique nature of our solutions is supported customer opinions expressed at exhibitions and trade fairs in Europe, Japan, and the Americas. At these events, our products are often recognised as technical trend setters in their respective sectors.

Sergiusz Martyniuk
Chairman of the Board, Pronar

1/2018

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GET TO KNOW US

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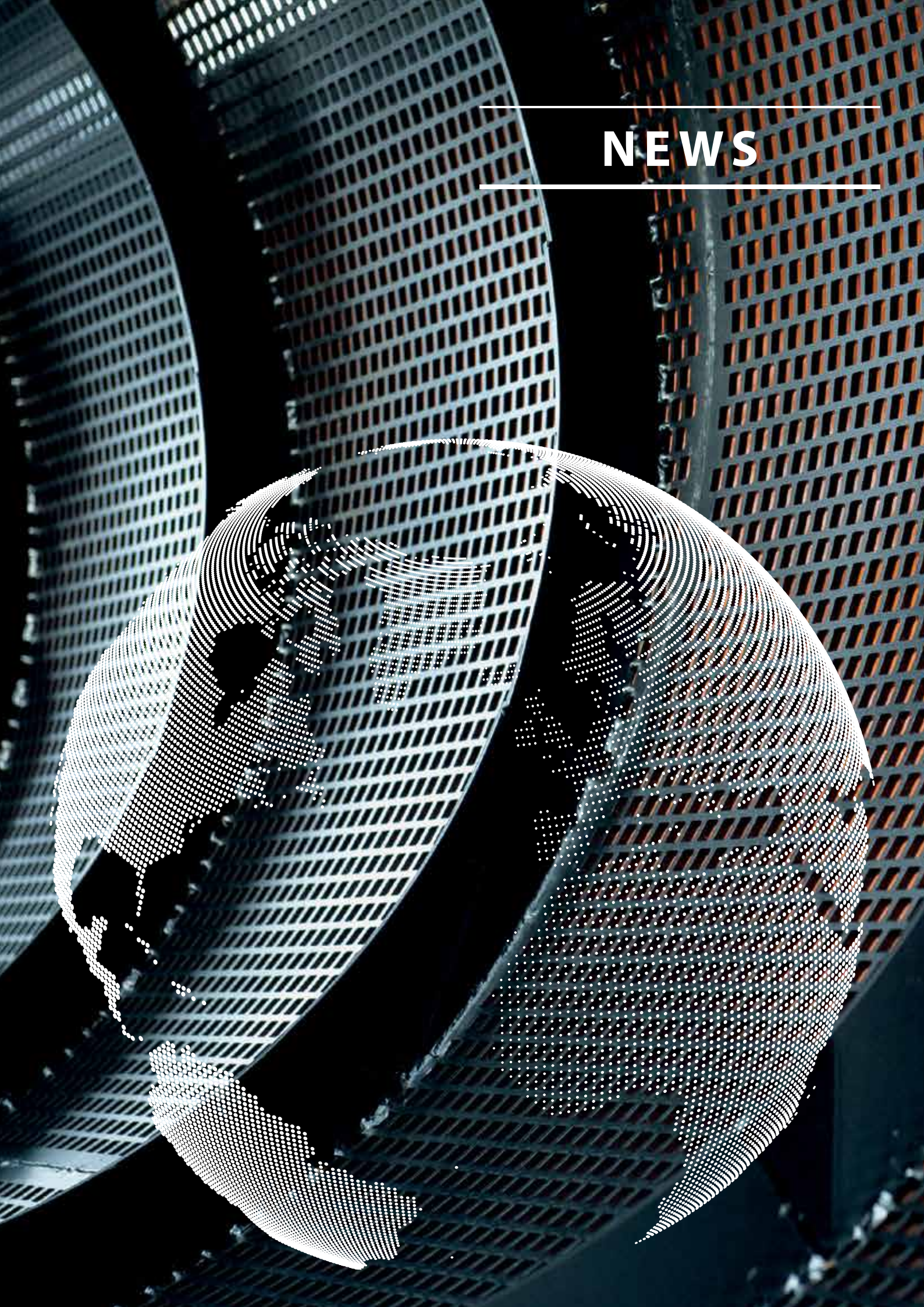

NEWS

NAREW - FACTORY NO 3

Total surface area of the plant: 25 263 m²
Surface area of the production floor: 10 191 m²
Cubic volume of plant's production space: 122 160 m³
Type of activity: production of steel sideboards,
Steel Wholesale

NAREW - FACTORY NO 1

Total surface area of the plant: 28 200 m²
Surface area of the production floor: 17 000 m²
Cubic volume of plant's production space: 136 000 m³
Type of activity: plastic components

NAREWKA

Total surface area of the plant: 128 737 m²
Surface area of the production floor: 26 943 m²
Cubic volume of plant's production space: 303 044 m³
Type of activity: production of large-size trailers
and disc wheels

STRABLA

Total surface area of the plant: 12 500 m²
Surface area of the production floor: 8 500 m²
Cubic volume of plant's production space: 120 309 m3
Type of activity: production of green forage machinery

SIEMIATYCZE

Total surface area of the plant: 118 369 m²
Surface area of the production floor: 48 000 m²
Cubic volume of plant's production space: 530 000 m³
Type of activity: production of municipal
and recycling machinery

HAJNÓWKA

Total surface area of the plant: 90 000 m²
Surface area of the production floor: 18 100 m²
Cubic volume of plant's production space: 218 000 m³
Type of activity: production of axles, gears,
steering systems and drivelines

SEVEN FACTORIES, EXPORTS TO 60 COUNTRIES

In 1988, when the imminent fall communism in Poland made it possible develop a private business, a few brave people led by Sergiusz Martyniuk (currently the Chairman of Pronar's Owners' Council) founded an enterprise called Pronar. Though Pronar was initially engaged primarily in sales, its development strategy assumed that the company would be involved in manufacturing. That assumption has proven correct – today the enterprise owns 7 factories and exports its products to 60 countries. Pronar was one of the first Polish companies to take advantage of the opportunities provided by free market.

NAREW - FACTORY NO 2

Total surface area of the plant: 170 809 m²
Surface area of the production floor: 79 662 m²
Cubic volume of plant's production space: 995 760 m3
Type of activity: production of trailers, disc wheels, hydraulic and pneumatic systems,assembly of tractors, Research and Development Centre

Over 30 years of operation, the company, based in the north-eastern Polish town of Narew, has built a strong position on numerous markets. With its seven factories, total production area of 210,000 m2, and staff of over 2,000, Pronar manufactures machinery designed for agriculture, municipal services, recycling and forestry, as well as side profiles, axles, wheel sets, disk wheels, pneumatic and power hydraulic components, and many other machinery and equipment components.

Pronar is one of the fastest-growing Polish companies thanks to its openness to innovative technologies, implementation of modern products, flexible approach to business, and hard-working, productive employees. Its global reach is supported by its safe, modern airfield, which enables fast communication with business partners from around the globe. The airfield is paved and equipped to operate 24 hours per day.

Pronar is also involved in the wholesale of oils and liquid fuels, including aviation fuel. The company also owns a chain of petrol stations and is involved in the wholesale of metal products to its partners in Poland and abroad.

With its enormous production capacity and qualified personnel, Pronar is a leading manufacturer of modern machinery and agricultural equipment. PRONAR products are available in 60 countries. Since 2003, the company has been the leading supplier of agriculture trailers in Poland and the second largest supplier in Germany. The company is the third-largest manufacturer of disc wheels (e.g. for agricultural, construction, military or forestry machines). Wheels are manufactured using cold machining technology, which is used by only a few companies worldwide.

The great interest in Pronar products comes not only from their well-developed, modern design and high functionality, but also from their excellent quality. This is evidenced by ISO 9001 and AQAP 2110 quality management certificates, which certify production in accordance with NATO standards. To meet the requirements, Pronar tests its products at its own Research & Development Centre, where 70 constructors and 180 engineers use state-of-the-art testing equipment. Pronar pays great attention to environmental protection across all its activities, which is confirmed by an ISO 14001 certificate.

Each year, Pronar wins many prizes and awards; for example, the Polish edition of Forbes magazine ranked Pronar second among companies with the most rapid value growth. This leading position is also proven by its leading position among manufacturers of agricultural machinery in Poland.

Pronar takes part in the most important fairs and industry events all over the world. Its machines attract a lot of interest from visitors and obtain the most favourable ratings from experts at events such as Agritechnica in Hanover and IFAT in Munich, as well as events in Argentina, Australia, Japan, New Zealand and the United States.

MP

THIS YEAR PRONAR CELEBRATES ITS 30TH ANNIVERSARY

The history of Pronar dates back to the end of 1980s, when the fall of communist regime in Poland coincided with shortages of most goods. In those times, those who wanted to achieve success had to take a great risks and be very resourceful. These were the qualities demonstrated by Pronar founders Sergiusz Martyniuk, Roman Omelianiuk, and Jan Czerniakiewicz. Today, thanks to their work, Pronar is a leader in the Polish agricultural, municipal and recycling industries, and has also seen success abroad.

As the company began during a period of great inflation when the Polish zloty was losing value overnight, its only option was to buy and sell goods. Though Pronar dealt mainly in food and farm produce, it always paid great attention to the fact that its principal area of business should be manufacturing. The company's name, Pronar, also represents its founders' approach to business. "Pro" stands for production, and "nar" stands for Narew, the town where the company is based.

An important event in Pronar's history was its opening of one of the first private petrol stations in Poland in 1990. This was a response to the enormous demand for fuel and the deregulation of the fuel sector. The station was very successful, and in time the company opened further stations. Currently, Pronar operates 17 petrol stations. The company also offers aviation fuel.

One year after opening the first station, Sergiusz Martyniuk was noticed by the editorial team of Agrobazar magazine. He was awarded the title of 'Agro-Businessman of the Year", a prize sponsored by the Ministry of Agriculture, for effective sales of farm produce abroad. This only confirmed that fact that Pronar was already a rapidly developing enterprise. Rather than spending the company's profits, the partners often contributed funds from their own

salaries. With hindsight, it's clear that this strategy paid off, as Pronar now owns all the facilities where it conducts its business.

The launch of tractor production in 1992 was a very important event in the history of the company. The tractors quickly gained trust of farmers, who chose them for their simple, durable design and easy operation. The tractors were continuously improved, and more and more components were manufactured in Pronar's factories.

The year 1997 marked a new chapter in the history of Pronar. On January 15 of that year, the company established the Disc Wheel Department. The department's products are intended for slow-speed vehicles, tractors, construction and forestry machinery, and military vehicles. In time, Pronar became an international leader in wheel manufacturing. It is now the third largest disc wheel manufacturer in the world. Its range includes several thousand variants, with such diverse production allowing the company to execute virtually any order, even if it is non-standard. Much credit is due to Pronar's engineers, who developed very efficient wheel production machines.

Pronar's headquarters and seven factories are located in Podlaskie province in north-eastern Poland. The first three factories were built in Narew, where the company is based. These factories produce trailers, disc wheels, power hydraulic components, plastic components and side profiles for trailers, and are also responsible for tractor assembly. Another factory, built in 2008, manufactures machines for green fodder, and another built in 2010 produces large-size trailers and wheel discs. In 2012, the company opened its sixth factory, which now manufactures recycling and municipal machinery. 2016 turned out to be a very important year for Pronar. Due to great demand for their products, the company expanded two factories which produce large-size trailers, wheel discs, and recycling and municipal machinery. Last year, the company opened its seventh factory, which produces axles, gearboxes, and wheel sets (both wheeled and caterpillar systems). The total production area of all Pronar's industrial facilities is 210,000 m^2. The company employs over 2,200 people. Among its many achievements, Pronar is proud to be the second-largest supplier or agricultural trailers in Germany.

Research and Development Center in Narew

Pronar machinery is distinguished by its high quality. This is the responsibility of both the Quality Control Department and the Research & Development Centre (RDC), which was launched in in 2015. The centre is equipped with state-of-the-art testing and measuring equipment. Its experts are highly trained and work in accordance with the appropriate procedures. In consequence, the RDC was able to obtain the relevant accreditations that allow it to provide specialist testing services. Test results obtained at the RDC are recognised worldwide. The RDC is not only used by Pronar – the biggest companies in the world use it to test new technologies and use the results to develop new products.

Pronar management leads the company in a very modern way, supported by the airfield opened in 2016. Its paved runway and adjacent helipad are suitable for all manner of small aircraft. Pronar management and employees have two aeroplanes and two helicopters, allowing them to travel to business meetings quickly and conveniently. The airfield is also available to emergency responders and the military, proving that Pronar is a socially responsible company.

Chairman of Pronar's Owners' Council Sergiusz Martyniuk in front of Pronar tractor.


Chairman of Pronar's Owners' Council signing first rim produced by Wheels Department

But Pronar doesn't rest on its laurels. Its engineers are continuously working on new solutions, with ongoing projects expected to further increase production potential, allowing the company to meet the constantly growing demand. This will be achieved with participation of highly qualified employees, the Research & Development Centre, quality control staff, and dealers from various countries, supported by Pronar training.

MP

EUROPEAN FORUM OF AGRICULTURE

On 23rd and 24th March, Jasionka near Rzeszów hosted another edition of the European Forum of Agriculture. Pronar was a partner of that two-day event. It was participated in by representatives of industry associations, experts and scientists, as well as prominent European politicians. A speech was also given by Sergiusz Martyniuk, President of our Owner's Council.

The meeting in Jasionka was an opportunity to talk about the most important issues regarding agriculture. They discussed the challenges, perspectives and chances for Polish and European agricultural and rural areas. The agenda contained many lectures and discussions on innovations in agriculture as well as presentations of products and services designed for agriculture. The topics included such issues as contemporary agriculture in the face of artificial intelligence, opportunities for agriculture with the use of farming bio-gas, plant fertilisation techniques, modern financial instruments and insurance in agriculture. Among others, the debates were participated in by Phil Hogan (EU Commissioner for Agriculture), Jarosław Gowin (Deputy Prime Minister and Minister of Science and Higher Education), Krzysztof Jurgiel (Minister of Agriculture and Rural Development), Stephane Travert (French Minister of Agriculture), Pavel Sekac (Czech Deputy Minister of Agriculture), Zsolt Feldman (Deputy Secretary of State at the Hungarian Ministry of Agriculture) and Wolfgang Burtscher (Deputy Director General at the Directorate General for Scientific Research and Innovation of the European Commission). The panel discussion was also participated in by Sergiusz Martyniuk, President of Pronar's Owners' Council, who noted the importance of innovations implemented by Pronar and their impact on the development of agriculture.

The European Forum of Agriculture is a very prestigious event. It is a continuation of meetings that have taken place since 2002 by the friends and partners of Józef Ślisz, the co-founder of Self-governing Trade Union of Individual Farmers "Solidarity", a leader of the countrymen who took part in many initiatives for the development of Polish rural areas. The meetings are aimed at commemorating the activities of Józef Ślisz, who was also the Deputy Speaker of the Polish Senate in the first and second term.

MP

ANOTHER PRONAR FACTORY

On October 30th of last year, Pronar opened a new factory. The event was attended by representatives from the local and national governments as well as around 300 guests representing Pronar's corporate and institutional partners. The new factory was opened in Hajnówka in the Podlaskie province of north-eastern Poland. The area of its production halls and warehouses is approximately 15,000 m^2.

The factory in Hajnówka is the seventh production plant owned by Pronar and the third opened last year. The opening ceremony was attended by, among others, Krzysztof Jurgiel, Minister of Agriculture and Rural Development; Jerzy Leszczyński, Marshal of Podlaskie Province; and Bohdan Paszkowski, Governor of Podlaskie Province. During the celebration, speeches were given by Sergiusz Martyniuk, Chairman of Pronar's Owners' Council, and representatives from the local government.

Krzysztof Jurgiel, Minister of Agriculture and Rural Development, awarded the "For Service to Agriculture" badge to 24 Pronar employees. Jerzy Leszczyński, Province Marshal, awarded Sergiusz Martyniuk, Chairman of Pronar's Owners' Council, with the Badge of Honour

"For Service to Podlaskie Province", and Minister Jurgiel received the Gold Medal of Pronar Owners.

The Hajnówka factory makes axles and suspension systems for trailers, and in future will also produce gearboxes and caterpillar systems. All such products are components for Pronar machinery assembled in the company's other factories, including trailers, trommel screens, and mowers. The products manufactured in the Hajnówka factory will also be offered to external customers.

The factory will employ around 300 people, including qualified production personnel such as CNC machine operators, welders and installers to work on the production lines. Employment will also be offered to process engineers, constructors, and production engineers.

AO

TECHAGRO IN BRNO

Between 8th and 12th April, Brno Exhibition Centre hosted TECHAGRO, the International Fair of Agricultural Machinery. Pronar machines were presented on a stand over 400 m2 in size prepared by our Czech trade partner. They could be seen by more than 110,000 guests.

At the fair, and for the first time in the Czech Republic, we presented our one-axle spreader NV161/4. It is a machine that features a solid and durable structure, designed for the precise and even spreading of not only manure but also peat or compost. The NV161/4 trailer has a load box with a capacity of over 13 m^3, and with its large wheels, it performs excellent on swampy grounds.

The stand also presented the Pronar machines that sell well in the Czech Republic. These included our trailers: T671 (one axle), T669/1, T700M, T902 (tandem axle), T026KM, T025 (bale trailer), T046 (for transporting animals) and T185 (hook type). Pronar also presented the Z245 bale wrapper.

TECHAGRO was a great opportunity for Czech farmers to buy new machines. All thanks to preferential financing terms prepared by Pronar along with our Czech business partner. They could be taken advantage of by anyone who visited our dealer's stand.

The size of the stand, the number of machines presented and the huge interest from the visitors clearly proves that the company seated in Narew has settled very well in the Czech Republic. Apart from Poland, it is another country where PRONAR products have gained much recognition.

LK

IFAT FAIR IN MUNICH

From 14th to 18th May, Munich hosted the International Fair of Environmental Protection (IFAT). This year, Pronar again had the largest stand of all the Polish exhibitors.

A novelty presented in Munich was our mobile slow-speed shredder: PRONAR MRW 1.300. It is the first single-shaft machine among MRW shredders. The shredder can be used for producing compost, shredding green organic or wooden waste, biomass, paper, plastics, foil or small scrap. With the appropriate configuration as well as various screens and counter-blades, the shredder is versatile. A great advantage of PRONAR MRW 1.300 is its wheel chassis based on axles that allow the machine to be hauled at up to 100 km/h.

The design for MRW 1.300 were carried out by qualified engineering staff from the Implementation Department in cooperation with specialists from Pronar's Research & Development Centre. With the use of ecological combustion engines, the machine meets the highest safety standards, is efficient and environmentally friendly. The mechanisms that improve the operator's working comfort and increase operating safety include the central lubrication system (for proper lubri-

cation of crucial areas), the system for automatic cooler cleaning (which ensures operation in highly dusty environments) and the remote control (used to adjust the motor operating parameters).

Another premiere shown in Munich was the first foreign presentation of our MBA 4512g compost turner. This machine is Pronar's response to the dynamically growing sector of recycling services. This high-performance turner has a shaft with a diameter of 1.2 m, which operates at a speed of up to 220 rpm. This makes it possible to turn up to 3,000 m^3 of mass per hour. The tracked chassis enables the machine to travel at up to 4 km/h and work on difficult ground. With the turner's hydraulic mechanism, the machine can be lifted (along with the working shaft) by 35 cm. The MBA 4512g is controlled by two joysticks and a large 10.4" touch screen.

On the exhibition stand, Pronar also presented its mobile slow-speed shredder MRW 2.85 in its tracked variant. It facilitates the preliminary processing of any material, such as municipal or construction waste, pallets, rubble, tree-clearing residues, roots or large-size materials. Similar to MRW 1.300, the MRW 2.85 is also supplied with axles that allow it to be hauled at up to 100 km/h.

The presence of Pronar at IFAT turned out to be a great success in terms of image. The presented products attracted a lot of visitors. Our representatives talked not only to guests coming from Europe but also from the United States and the Far East. They emphasised the high quality and attractive prices offered by Pronar.

MP

RECYCLING MACHINES IN AUSTRIA

In mid-September 2017, in Knittelfeld, Austria, the Kompostwerk Naturgut facility hosted its annual national exhibition of recycling machinery, together with lectures by experts and academics associated with the compost industry.

This year's edition, sponsored by the Austrian Compost Association, gathered a record number of exhibitors and guests. Our Pronar MPB 18.47 mobile trommel attracted great interest from visitors. Pronar representatives were pleased by favourable reviews from industry experts, which were confirmed by a strong machinery sales during the event. The participants could see multimedia presentations of Pronar's recycling machines and the 3D models of the MPB 20.55g trommel and the MRW 2.1010 shredder.

MK

PRONAR

YOU DESERVE PEACE OF MIND

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MUNICIPAL MACHINERY

RECYCLING MACHINERY

24 MONTHS WARRANTY

TRAILERS

FRONT LOADERS & ACCESSORIES

The offer applies to trailers, green forage machinery, front loaders & accessories, municipal and recycling machines. For more information please contact dealers.

MUNICIPAL AND RECYCLING MACHINERY

SLOW-SPEED MOBILE SHREDDERS IN SCANDINAVIA

THE MRW 2.85 EXPANDS TO NEW MARKETS

Pronar's factory in Siemiatycze in north-eastern Poland's Podlaskie, established in 2016, has enabled us to boost production of MRW 2.85 mobile shredders, in turn enabling us to export the products to new markets such as Sweden and Germany. This has contributed to increasing awareness of the Pronar brand across Europe.

Scandinavian markets are distinguished by demanding customer requirements in terms of technical parameters, production quality, and compliance with strict environmental standards. Climatic factors also play an important role in operating machinery in the region. High humidity and low air temperatures require the installation of additional components to ensure proper operation.

Why do Scandinavian clients choose Pronar machines more and more often? Our use of state-of-the-art manufacturing technologies, high-end materials and components, and the ability to equip the shredders with a wide variety of additional equipment elements to improve their functionality and efficiency are all significant factors. Another important factor in support of the increasing popularity of Pronar recycling machines is our competitive pricing and maintenance services. Our efficient and competent maintenance department, which delivers replacement parts quickly, is one of the most important elements of customer service at Pronar.

Pronar MRW 2.85 shredders are driven by combustion engines which generate nearly 300 kW of power, and which comply with European Standard Stage 4 (EPA Tier 4 Final in the United States), or by electric motors. The machines have passed numerous tests and comprehensive operating trials. Both Norwegian and Swedish customers have confirmed that the MRW 2.85 shredder is the product with best-in-class operating quality, dealing effectively with waste (various large-size waste, old telephone poles, and railway sleepers) that causes difficulties for machines supplied by many other manufacturers.

The efficient operation of Pronar shredders in the Scandinavian climate is ensured by components such as the hydraulic oil heating system or the caterpillar drive, which enables the machines to be transported over difficult surfaces. For wheel-chassis shredders (very much appreciated by clients), the self-propelled hydraulic system (approved for use with a trailer)

allows the machine to move independently over a level surface. The shredders purchased by Scandinavian clients were equipped with an extra set of shredding shafts.

Waste management companies are the primary users of Pronar MRW 2.85 shredders in Scandinavia. They expect machines which prepare material of the appropriate fraction size at the final shredding stage. Pronar shredders guarantee this, thanks to the use of several types of breaking bars.

Our experience confirms that competing against the leading manufacturers of recycling machinery requires adapting the product to customer needs, providing appropriate for money ratio and best-in-class delivery time, and an efficient and competent service department.

Bartosz Tomczak
The author is deputy director international sales

PRONAR MPT 24G AND MPT 18G BELT CONVEYERS

EFFICIENT AND USEFUL IN STORAGE

Pronar manufactures the MPT 24g and MPT 18g belt conveyors. Both machines are designed for the transport of gavel, soil, aggregate, coal, compost and many other bulk materials.

The lengths of the Pronar MPT 24g and MPT 18g belt conveyors are 23 and 18 m, respectively, and the maximum angles of structural surface inclination relative to the ground are 27.2o and 25.2o, respectively. This allows for the formation of even 11.3 m high piles. Both conveyors have a belt with a width of 1000 or 1050 mm, powered by a hydraulic piston engine with a reducer from a well-known Italian brand. This ensures transport of material at a speed of up to 2 m/s, in turn enabling throughput of as much as 600 t/h.

With the conveyor, material can be transported over short distances without previous storage. In such case, the machine is one element in material (municipal waste) processing or supports the work in the gravel pit. The conveyor may also be used to form piles of desired height. This saves time (no need to use a loader), money (operating costs) and space (the prism can be higher than if you build it directly from a screen or shredder).

The conveyer's caterpillar chassis and drive system make it possible to move the conveyor across the working area without attaching it to a tractor. The conveyors are equipped with economical CAT Stage IIIB motors (Tier IV in the US) with a capacity of 3.4 l and a power of 55.4 kW. Operational safety may be additionally increased by installing the Cleanfix system, which prevents the motor from overheating. The system is particularly useful for machines operating in highly dusty environments.

Compact size is a very important feature of both Pronar belt conveyors. After folding the belts, each version can be easily loaded into a 40' high container. The weight of each conveyor does not exceed 16 t, which makes it possible to transport MPT 24g or MPT 18 g on public roads worldwide, without any special permits.

Both machines are also compatible with a wide range of accessories, such as a direct discharge hopper with overboards (useful for loading with a loader); replaceable loading hopper linings made of abrasion-resistant steel; mechanical or hydraulic hopper supports (recommended for working with heavy materials); or anti-dust shields.On request, Pronar can provide the machine with a customized belt (rubber type, abrasion class, lining thickness), add lateral seals for the conveyor or belt scraper. MPT 24g conveyor is also available with a remote control. Pronar mobile belt conveyors have extended our range of recycling machines, currently composed of: the MPB mobile trommel, the MRW mobile slow-speed shredder, and the MBA mobile compost turner.

Both conveyor models (MPT 24g and MPT 18g) may perfectly complement various transport lines or lines used to support gravel pit operations, ensuring a high efficiency and continuous operation.

Bartosz Tomczak

The author is deputy director international sales

RECYCLING MACHINERY

MEASURABLE BENEFITS

Companies which use their recycling machines responsibly can not only reduce their costs but also increase revenue.

The process of recycling various raw materials may face obstacles resulting from the physical properties of the material (for example large dimensions). In that case, the material must be shredded. This is where Pronar MRW slow-speed shredders come in. They reduce the initial size of the material to be recycled and thus prepare it for further processing to be performed by other Pronar recycling machinery. The volume reduction also makes it possible to store more raw materials on-site (shredding, crushing and squeezing reduces space needed, as in the case of large-size municipal waste such as furniture).

The shredded material is suitable for further processing using equipment such as Pronar MPB mobile trommels, which separate the input material into two fractions with different sizes. Fractionally sorted material such as coal, gravel, and wood by-products often obtain a higher price than unsorted material. The Pronar trommel can also be used to separate material from loose contaminants, for example to separate soil from shredded wood chips. The wood chips can then be sent for processing or to an incineration plant, and the soil (containing a lot of humus) may be used as fertiliser or substrate.

The Pronar MPT mobile belt conveyor can be placed at any point on the process chain. One advantage of its design is the possibility to transport the material in such a way as to ensure a high pile is formed. With Pronar's belt conveyors, this work can be performed independently, without using a separate loader, therefore significantly reducing operating costs. The storage pile height – much higher than that possible with a loader – allows for more efficient use of storage space. By optimising the use of storage space, waste processing companies longer for raw materials prices to increase. The motors used in belt conveyors operate steadily and in better conditions those used in loaders, which translates into a longer service life. In the case of a conveyor, the total cost of purchase and operation is much lower (and the working efficiency is considerably higher) than the costs of purchase and operation of a backhoe or front loader.

Jakub Jodłowski

The author is a product manager at Pronar

PRONAR RECYCLING LINES

WORKING ON ALL CONTINENTS

For several years, Pronar has manufactured various machines for recycling operations: mobile trommels (MPB), mobile slow-speed shredders (MRW), and mobile belt conveyors (MPT). Every year, the company introduces new models and extends the range of available accessories.

Pronar recycling machines are currently sold in North America, Australia, Asia, and Europe. Pronar continuously works to improve its dealership network and export its products to new markets.

Pronar recycling machines are distinguished by their high quality and competitive pricing, and by the ability to customize each model to best suit customer needs.

Pronar offers a wide range of recycling machines, with each model customizable in terms of: chassis (wheels, caterpillars, or a hook system), drive (internal combustion engines provided by leading manufacturers or electric motors) and a variety of accessories. This means Pronar is able to deliver machines adapted to specific environments and requirements. However, the product range presented in the sales catalogue is not all Pronar has to offer. Our constructors can analyse any problem and design custom solutions not available from other manufacturers. That's what makes dealers and customers alike appreciate Pronar so deeply.

Our staff are engaged and aware of their responsibility for the machines rolling off the production lines. Our broad and expanding presence on various markets is also thanks to coordination of activities and exchange of information among dealers, salespeople, and our Implementation Department. Implementation Department engineers also receive suggestions from operators and visitors at various industry fairs for news designs of recycling machines. These suggestions are then analysed along with the means to implement them.

Mobile trommels separate the load into two fractions, allowing for more effective processing than is possible for mixed municipal waste. Moreover, the accessories and optional components ensure separation of the various fractions (metal, lightweight materials, oversized materials). For example, a magnet installed on the conveyor separates ferrous materials.

Pronar mobile slow-speed shredders are primarily used for shredding such materials as furniture, home appliances, municipal

waste, tree roots, pallets and many others. This provides up to a ten-fold reduction in storage area, and consequently a considerable decrease in the storage costs and the ability to serve more customers.

Pronar MPT mobile belt conveyors allow operators both to reduce loader-related operating costs and to limit the risk of accidents and damage to the machinery. With our conveyors, material can be processed continuously and without downtime. Their versatility and functionality makes them perfect not only for municipal waste management, but also for companies involved in the transport of gravel, soil, aggregate, coal, compost or other bulk materials.

Pronar recycling machines are presently sold in over 25 countries. Customers appreciate the ability to adapt each model to their individual needs (e.g. by choosing the type of power supply), as well as the machines reliability in challenging conditions. All this allows us to export our products to many markets.

Mateusz Daniluk

The author is an international trade specialist at Pronar

NEW

PRONAR MBA 4512g COMPOST TURNER

Dynamic growth in the recycling industry has resulted in increasing demand for high-performance machinery to support effective waste management. This is why we introduced our Pronar MBA 4512g compost turner.

The turner is equipped with a 1.2 m diameter shaft, which operates at a speed of up to 220 rpm. It is powered by a 218-hp diesel engine meeting EU Stage IV emissions standards. The shaft's blades, shares, and skids mounted on the scraping blades are made of abrasion-resistant steel. The operator can change the rotation direction at any time, including during compost loading. The sprinkling system installed in the machine moistens the turned material. This ensures optimum conditions for the compost matter to mature. The Pronar MBA 4512g can handle 3,000 m^3/h of matter turned in piles 4.5 m wide and up to 2.2 m high. Its caterpillar chassis allows for convenient manoeuvring and working on difficult terrain (unstable ground) as well as travelling at a maximum speed of 4 km/h. The turner's hydraulic mechanism allows the machine (along with the working shaft) to be lifted by 35 cm. The machine is controlled by two joysticks and a large 10.4" touch screen.

The operation of MBA 4512g is convenient and highly intuitive. The turner is provided with a central system for the replacement of operating fluids, carried to the outside. The central lubrication system improves the working comfort and ensures continuous lubrication in the machine's critical points, thereby extending its service life. The parking power supply system allows service and maintenance works to be performed without starting the motor. The MBA 4512g

can work in challenging conditions thanks to its hydraulic oil heating system (activated at low temperatures) and the Cleanfix automatic cooler cleaning system (for dusty environments). Pronar design engineers have also considered operator comfort, which is considerably increased by the pneumatically-suspended seat with automatic positioning and vibration damping. The high cabin position ensures good visibility. Air conditioning and heating systems allow for comfort in both extremely high and extremely low ambient temperatures, and the air purifying sys-

tem (designed as per EN-15695, Cat. 4) provides clean air without any dust or exterior odours.

Front and rear lights (used when working after sunset) and a rear-view camera facilitate work and increase safety. In case of rain, visibility is improved by the wipers installed at each side of the cabin. The functionality of MBA 4512g is also improved by the following accessories: a pneumatic system (for machine cleaning), a CB radio, and side mirrors.

The Pronar MBA 4512g is another element in our line of recycling machines. It consists of mobile slow-speed shredders, trommels, and belt conveyors. The machines are supplied with various drives, and the available accessories and optional components make it easier to adapt the equipment to current and future customer needs. The complementary line of Pronar recycling machines allows for efficient waste management.

Mateusz Pietruszka

The author is a public relations and marketing specialist at Pronar


MBA 4512g
pronar-recycling.com
PRONAR
VOLVO
PENTA

MOBILE TROMMEL SCREENS IN BENELUX COUNTRIES

PRONAR LISTENS TO WHAT THE MARKET SAYS

At the beginning of the year, a Belgian company involved in the manufacture of gardening substrates, including compost, bought the electric version of the largest PRONAR trommel: 20.72e. Driven by a 55 kW electric motor by ABB, the machine is provided with such components as a drum, 2 m in diameter and 7.20 m in length. The MPB 20.72 machines feature the highest efficiency among all Pronar trommel screens.

The Belgian buyer uses the trommel screen at its plant producing high-quality compost. The company needed a functional and highly efficient machine. Our MPB 20.72e trommel screen meets these conditions. Its design allows for free travel as well as for planning and optimising the production of high-quality gardening substrates.

"It is thanks to PRONAR MPB 20.72e that we can work on a 'plug and play' basis" says Bart Geerts, the company manager. The internal drum covers, made of a 1.5 mm corrosion-resistant sheet metal and the structure of the rear chute (which also does not corrode), are crucial components, which are exposed to agents that increase the risk of corrosion.

"Different stages of working with compost require screening, when the compost is wet and its temperature quite high." "Then it contains a lot of acid, and this is the moment when the stainless components of the machine prove themselves" adds Bart Geerts. The mobility and high efficiency of PRONAR MPB 20.72e enables the company to think about increasing the range and area of activity.

The electrically driven MPB 20.72e may be provided with a dolly. With this, the trommel screen can be moved on a working area and transported at large distances using a tractor or another vehicle. A clear advantage of this electric machine is that it eliminates the need to buy fuel, filters and operating fluids, which makes for considerable savings if we consider its life span.

The Belgian purchaser is very pleased with Pronar's trommel screen, its performance and especially the quality of compost substrates obtained with the use of the MPB 20.72e. Its high rating is proven by the order of another MPB 20.72 trommel screen, this time with a combustion engine but also with the same equipment as the previously purchased model.

Pronar's foreign business partners have noticed the high functionality of Pronar products, the option to customise the equipment on any model and the wide range of machines that can be interconnected to form a process line used for such operations as the recycling of municipal waste or the production of gardening substrates.

Wim Heynickx, a representative of Pronar's dealer from Belgium, has

highlighted that apart from offering a lot of trommel and shredder models, the company from Narew continuously introduces new recycling machines.

At the end of last year, Pronar started to provide their trommel screens with star-shaped decks that can easily substitute a screening drum. At the beginning of this year, they began to produce two MPT belt conveyor models and an MBA 4512g compost turner.

Pronar started the production of star-shaped decks, as certain types of waste are difficult to process with a drum, which was noted during testing. This is why Pronar offer their customers the option to increase the functionality of the machine, which uses a star-shaped deck to screen the material in a very effective and precise way. "That equipment enables the use of two different screens. This improves the effects of work, saves us time and money" a representative of the Belgian dealer praises the solution proposed by Pronar.

On the other hand, Jimmy Van Herwijnen, a representative of a Dutch dealer, emphasises that there are more and more customers who perceive Pronar as a company offering high-quality machines, which in combination with their attractive price and good after-sale services makes PRONAR increasingly popular. Being present in many foreign countries, Pronar can design machines that match the needs of all customers. Therefore, the sales of mobile trommel screens in Benelux countries are constantly increasing.

"Good service is a key to high sales" explains the Dutch dealer's representative. "The Pronar machines we sell are then used by the customers under a heavy load." "Our after-sale services require our employees to have highly specialised knowledge about how these machines operate" he highlights.

An efficient and competent after-sale service ensured by dealers plays a crucial role when you need help or advice (e.g., when it comes to improving the operating parameters or servicing). High qualifications of the service personnel and their availability (e.g., providing advice by phone) make customers certain that they can count on reliable assistance if something unexpected happens. This is very important, as the servicing and possible repairs of machinery require us to take action as instructed by the manufacturer.

Pronar trommels and shredders must operate efficiently and without failure, as they bring business opportunities and profits to companies. "If you buy a machine, it can't stay dormant." "We are always ready to help in case of any failure" assures Van Herwijnen.

In the view of Pronar dealers, an efficient, fast and competent maintenance service is more important to the buyers than the price paid for the machine. Due to their high quality, Pronar machines feature a low failure rate, which makes for a long and useful life. "Our customers have noticed that, and this is why they choose Pronar machinery more and more often" Herwijnen says.

The efficient after-sale service provided by competent personnel is one of the factors that has allowed PRONAR to succeed internationally. This is why Pronar care about improving the expertise and competence of their dealers' staff. To this end, they organise training courses and visits to their factories, where the dealers' representatives learn the manufacturing processes, and meet the designers, who answer their questions and explain how Pronar machines operate.

According to Wim Heynickx, Pronar are continuously improving innovation in their products. They also analyse customer preferences, which is why their products are user friendly and effective. A high-class team of engineers quickly respond to suggestions from the market regarding the machine structure or to emerging demands that can be satisfied by Pronar machines. "This is one of the most important advantages of Pronar: they can listen to the market" assures Heynickx.

Adam Banasiuk

The author is an international trade specialist at Pronar.

NEW

MOBILE SLOW-SPEED SHREDDER PRONAR MRW 1.300

Pronar introduce a new mobile slow-speed shredder: MRW 1.300. The line of recycling machines will be complemented by a single-shaft system. The shredder can be used for producing compost, shredding green organic or wooden waste, biomass, paper, plastics, foil or small scrap. Each shredder model offers many equipment configurations (such as cutting teeth, combs, beams, shredding screens or counter-blades), which can be customised as specified by the customer.

PRONAR MRW 1.300 single-shaft shredder makes waste processing more productive by improving its efficiency and the quality of input shredding. The fractions obtained in shredding may be used e.g., to produce RDFs (refuse-derived fuels with a high net calorific value), fertilisers, high-quality compost or can be used for further processing. The PRONAR MRW 1.300 may be successfully used for gardening production or as the next step in the waste processing line.

Safe operation of the shredding system is ensured by the pivoting beam unit with counter-blades, which allows for ejecting elements that are too big or impossible to be shredded, thus protecting the shredder against damage. The standard mounted electrical reverse system enables the shaft to rotate in any direction without starting the combustion engine. This solution allows you to remove any clogs that block the work piece. Direct transmission of power from the engine to the

shaft reduces fuel consumption. To protect the engine, the transmission and shaft components and shredding blades, the system uses a hydro-kinetic clutch that absorbs any impacts generated in the transmission unit.

The shredder was tested at Pronar's Research & Development Centre, which allowed them to minimise the time required to release the machine for production. With the research capacity of Pronar's R&D Centre, the tests of different shredder components involved simulating their operation over a long period. Positive results obtained in successful testing guarantee proper functioning of all components of the shredder and ensure safe operation. The design process was participated in by experienced designers from Pronar. This allowed them to develop a high-performance machine that is environmentally friendly and meets the required quality and product standards. Among other things, it was achieved by using combustion engines meeting current emission standards and an appropriate design that ensures quiet operation and thus improves the comfort around it.

PRONAR MRW 1.300 is settled on a wheel chassis, which allows for quick transport without using any specialised equipment or applying for permits. Equipped with ABS and traction control systems, which considerably improve safety, the shredder can be transported at a maximum speed of 100 km/h.

The components that improve the operator's working comfort and increase operating safety include a central lubrication system (for proper lubrication of the crucial areas), a system for automatic cooler cleaning (which ensures operation in highly dusty environments) and the remote control (used to adjust the motor operating parameters).

Jakub Jodłowski

The author is a product manager at Pronar

SINGLE-SHAFT

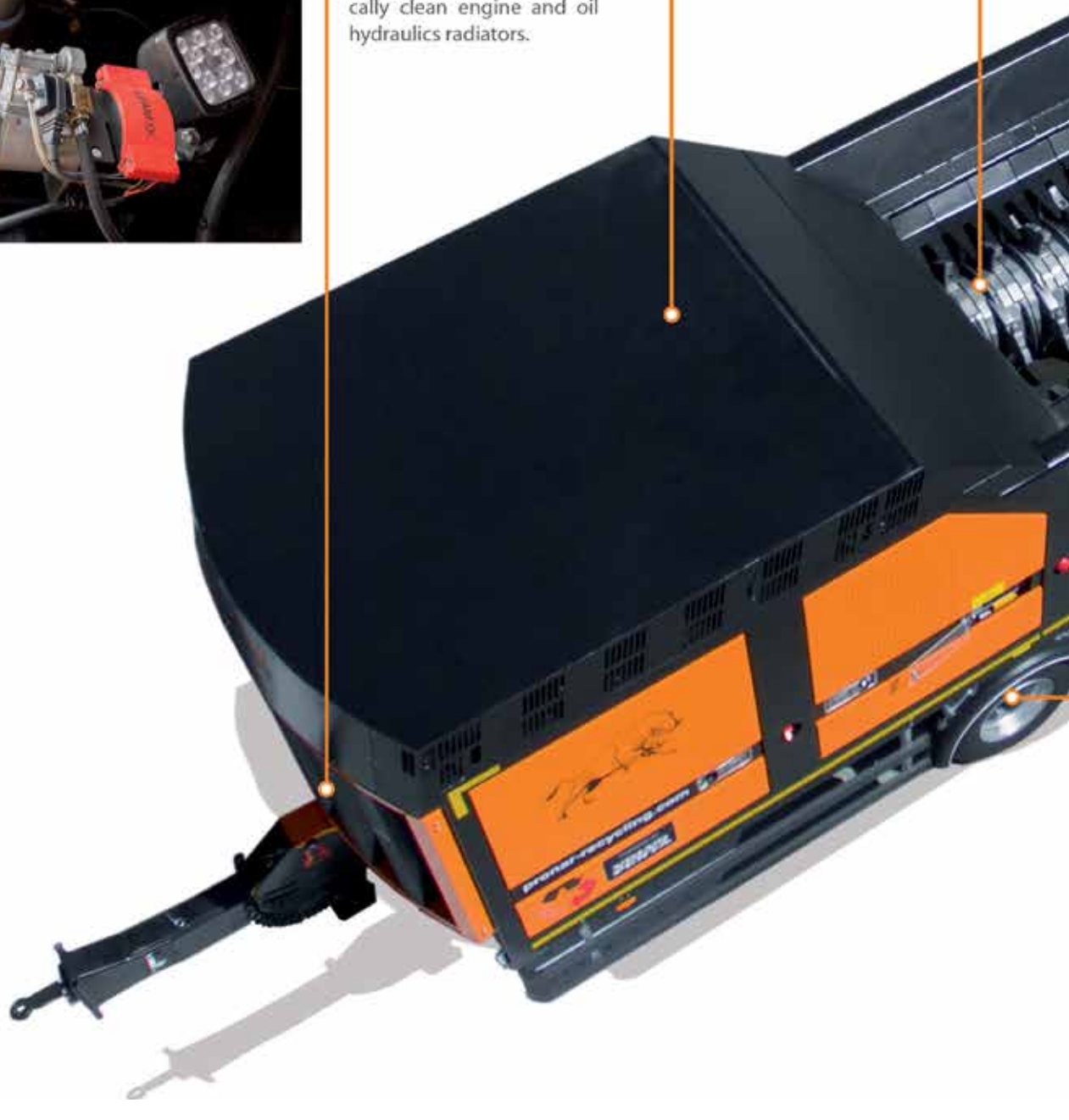
Maximum speed: 27 rpm. Depending on the purpose, cutting knives of various types are available: breaking (wood, green waste, wood waste, household waste, plastic), cutting (rubber, foils, plastics, fabrics), crushing (roots, logs, railway sleepers).

DIESEL ENGINE

Volvo Penta (EU Stage 4, 12,8 L; 405 kW (550 HP)/1900 rpm)

CLEANFIX

Cleanfix systems automatically clean engine and oil hydraulics radiators.



42 KNIFE ATTACHMENT SOCKETS

Standard shaft has 42 knife attachment sockets. Assembly and replacement are possible using generally available tools and exchange is fast.

TILTING BAR WITH COUNTER KNIVES

Tilting bar with counter knives is responsible for protection of the shredding system. It allows to eject a large, unbreakable material preventing the shredder from damage. The electric reverse system fitted as standard allows the shaft to be rotated in any direction without starting the combustion engine to remove blockages.

ABS AND TRACTION CONTROL

European road homologation for transport up to 100 km/h.

RECYCLING EQUIPMENT RANGE

MOBILE SLOW-SPEED SHREDDERS


MRW1.300


MRW2.85


MRW2.85g


MRW2.85h


MRW2.1010

MOBILE TROMMEL SCREENS


MPB14.44


MPB18.47


MPB18.47g


MPB20.55


MPB20.55g


MPB20.55gh


MPB20.72


MPB20.72g

MOBILE STOCKPILERS


MPT18g


MPT24g

WINDROW TURNER


MBA45.12

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PRONAR BBK M MULCHERS

EXTENSIVE VARIETY

In the spring, when everything starts to turn green, on the need for regular maintenance of road shoulders, green strips, and parks quickly becomes apparent. With autumn comes the necessity to mow pastures and clean fields after the corn or tobacco harvest. Mulchers are best suited for this kind of work. For the best results, high-quality mulchers should be used. It is also important to select the right machinery for the size and scope of the task at hand.

Pronar manufactures a wide range of machinery, including mulchers. Our modernised rear-side BBK M mulchers, used for all manner of municipal and agricultural cleanup works, are worth particular attention. The Pronar BBK M series includes 5 models: the BBK120M, BBK140M, BBK160M, BBK180M and BBK200M. In each case, the number refer to operating width in centimetres, and the letter M means that the model has been modernised.

BBK M are called rear-side mulchers due to the face that they are connected to the rear of the tractor. Their design allows for easy mounting using a rear three-point suspension system. The minimum tractor power to ensure proper operation for the BBK120M and BBK140M is 30 bhp. The BBK160M, BBK180M and BBK200M mulchers require 50, 60 and 70 bhp, respectively.

The suspension system consists of a special bar called a pantograph, which allows for manoeuvring the mulcher without changing the tractor's driving track. This is particularly important and useful when navigating around trees, posts, road signs or barriers. With the option to adjust the operating angle, BBK M mulchers are especially effective in mowing road shoulders or areas with a variable incline. The range of angle adjustment is +94° to -65°, which makes it easier to mulch tight areas such as drainage ditches and steep road embankments. Another important mulcher feature is the collision protection system, which lifts the mulcher and deflects it backwards when an obstacle is encountered.

Thanks to an adjustable tracing shaft, in BBK M mulchers can be set at three different mowing heights: 20, 50 and 60 mm. Additionally, their skids are also adjustable, which allows the mulchers to be set in a position that enabling easier travel over uneven surfaces. The skids are made of an abrasion-resistant sheet supplied by a well-known manufacturer, so they do not wear out too quickly. The internal shall is made of the same material and is also replicable.

Depending on the model and operating width, the number of blades ranges from 10 (BBK120M) to 18 (BBK200M). Pronar BBK M mulchers can be equipped with various types of blades, depending on the work to be performed. Heavy (1.5 kg each) "hammer" swingles effectively mow thick bushes, while Y-shaped swingles are excellent for mowing grass, and "YI" swingles additionally scarify and aerate the soil under the mown grass. With their extensive range of swingles, BBK M mulchers are widely used in agricultural and forestry, as well as for public road works and waste land reclamation.

The range of BBK M mulchers is complemented by such products as BK M (rear-front) mulchers. As for the BBK M series, the model names specify the operating width: BK110M, BK140M, BK160M, BK180M and BK200M. BKD, another series of mulchers with operating widths of 1.6 to 2 m, are characterised by their hydraulic perpendicular lateral shift, allowing for even easier passage over obstacles.

Łukasz Wąs
The author is a specialist in international trade at Pronar

PRONAR BBK160M

PRONAR BBK180M

PRONAR BBK200M

PRONAR BBK140M

Blades and swingles installed on Pronar BK M, BBK M and BKD mulchers and on Pronar GK110 and Pronar GK140 mowing heads

Design	Approximate weight (kg)	Name	Maximum branch thickness (mm)	Mowed or shredded material	Models and series of suitable mulchers	Blade type
	0.7	medium hammer swingle	60	grass, stalks, sprouts, bushes, branches, stubble and stubble fields, crop residues	GK110, GK140, Series: BK M, BBK M, BKD	110E
	1.5	heavy hammer swingle	100	grass, stalks, sprouts, bushes, branches, stubble and stubble fields, crop residues	GK110, GK140, Series: BK M, BBK M, BKD	110D
	1	heavy Y blade	60	grass, stalks, spouts, bushes, branches	GK110, GK140, Series: BK M, BBK M, BKD	110A
	1.4	heavy YI blade	60	grass, stalks, spouts, small bushes, thin branches	GK110, GK140, Series: BK M, BBK M, BKD	110B
	1.6	heavy YY blade	60	grass, stalks, sprouts, bushes, branches, stubble and stubble fields, crop residues	GK110, GK140, Series: BK M, BBK M, BKD	110C
	1.2	T blade	60	grass, stalks, sprouts, bushes, branches, stubble and stubble fields, crop residues	GK110, GK140, Series: BK M, BBK M, BKD	110F
	1.5	TI blade	60	grass, stalks, sprouts, bushes, branches, stubble and stubble fields, crop residues	GK110, GK140, Series: BK M, BBK M, BKD	110G

PRONAR WWT600P EXTENSION ARM

A VERSATILE WORKING TOOL

Pronar is continuously expanding its product range to meet changing demand in the municipal machinery sector. This attention to customer needs is exemplified by the introduction of the Pronar WWT600P rear multifunction extension arm.

Designed to be mounted to a the rear three-point suspension system of a tractor weighing over 5,000 kg, the arm is supplied with an independent hydraulic system that consists of two pumps with a total power of 39.5 kW, connected to the tractor's power-take-off shaft via a multiplier. The first pump, with a power of 33 kW, feeds the arm and head motion control system. The second pump, with a power of 6.5 kW, is responsible for powering the head with the option to change the direction of shaft rotation. A large oil tank with a capacity of 180 litres, located on the side opposite to the arms, acts as a counterweight which stabilises the carrier. The arms are controlled by a hydraulic separator equipped with a system of mechanical cords connected to levers. The WWT600P has an arm with a horizontal range of 6 m and parallelogram geometry. Thanks to that geometry, while extending the arm, the operating head movies in a straight line in parallel to the ground. In conventional extension arms, the head curves upward during arm extension. With the parallel arm installed on the WWT600P, the operator does not have to constantly adjust head height. Instead, the operator uses a single lever to adjust head range. This feature, combined with shock absorbers on the arm and the head, enables even smoother and more precise mowing of shoulders and cutting of hedges.

When working with the extension arm, it is very important to ensure the safety of the operator and others, as well as precision operation of the machine. The limitation of range control to a single lever has considerably shortened reaction time for obstacles such as shoulder posts or stones. The possibility to react quickly using only one control lever directly translates into increased safety and improved operator comfort.

Since the actuators are not installed under the arm as in conventional rear extension arms, the Pronar WWT600P offers greater clearance over barriers and road signs, which is an important parameter for the suitability of the machine for the maintenance of road and motorway shoulders. Another advantage of WWT600P is the possibility to cut close to the tractor in narrow areas, both in the horizontal and vertical planes.

When changing the horizontal range, the mowing head maintains the same mowing height, which is very important when cutting hedges. With these features, the machine becomes a very useful and desired tool for orchards and companies providing municipal services involving the cutting of trees and hedges.

We call the WWT600P extension arm 'multifunctional' for a reason – it is compatible with various Pronar mowing heads, such as the GK80L, GK100L, GK120L, GK140L and GK110, and with other tools such as the GO800 ditch digger, the GP200 branch saw, the GN200 shear cutting machine, and the GM500 road sign washer GM500.

The wide range of Pronar operating heads ensures versatility for all manner of municipal works.

Michał Kalenik

The author is a constructor at Pronar's Implementation Department.

GREEN FORAGE MACHINERY

DEVELOPMENT OF NEW EQUIPMENT

THE PRONAR KPR500 SHREDDING MOWER

Thanks to accurate assessment of client demand, Pronar builds machines which employ innovative solutions. An example of this is our development of the KPR500 shredding mower, carried out by our Implementation Department.

The design of KPR500 is based on a strong, stiff frame composed of a main deck and two wings which move from a 25° down angle to a 93° up angle. This solution, combined with a specially designed suspension system, ensures that the mower can perfectly adapt to the terrain. The draw bar and wheel suspension of the main deck and wings form the suspension structure. All these components are perfectly synchronised by a strand system, such that while the draw bar and wheels are lifted, the KPR500 maintains a constant angle relative to the ground, irrespective of the lifting height. Consequently, changing mowing parameters does not require any additional adjustment of the mower's position relative to the ground.

The massive blades make the mower versatile capable of mowing large areas. It can be used for a wide variety of activities, such as cutting and shredding grass and weeds and mowing shrubs and bushes. The weight of the Pronar KPR500 is approximately 2,800 kg, making it compatible with tractors generating at least 120 bhp (88 kW). The KPR500's three cutting heads (one installed on the main deck and two at the wings) provide an operating width of 5 m.

The KPR500 is fitted with strong gearboxes and shafts that ensure the failure-free operation of the cutting heads. Each head has three solid blades which provide firm cutting and excellent shredding of mowed material. Precise and efficient adjustment of mowing height (25–400 mm) does not require any additional tools and is performed by changing the number of distance plates which restrict the stroke of the actuator responsible for lifting the whole mower. The mower is provided with protective chains and special skids made of abrasion-resistant material located on the winds and deck.

It should be noted that the four wheels of the main deck are installed in two pairs in order to ensure self-alignment, so the mower can smooth-

ly move across the ground, regardless of topography. As the weight of the Pronar KPR500 is distributed across six wheels, the mower does not make deep ruts in the ground.

The mower is transported on four wheels, with its wings hydraulically folded and the main deck maximally lifted (to ensure maximum clearance). In such a configuration, the machine's width and height do not exceed 3 metres. Additional equipment, being important for safe transport of the mower on public roads, are the warning plates and rear lighting. Additional warning plates and rear lighting are important for save transport of the mower on public roads.

Konrad Sienicki

The author is a constructor at Pronar's Implementation Department.

IMPLEMENTATION WORK FOR PRONAR ZKP900D DOUBLE-ROTOR RAKE

LATERAL ACCUMULATION OF SWATH

Pronar carry out implementation work for a new model of the double-rotor rake called ZKP900D.
The machine is characterised by the option to put the raked swath aside to form a single side bank or (after removing the rotors) two smaller banks.

The ZKP900D is a machine that features the largest operating width and the highest efficiency among all Pronar's products. It can easily meet the requirements of farms with an extensive area of grasslands.

Similar to the ZKP800, our ZKP900D rake with side swath accumulation is designed on a stiff and very strong frame provided with a steering system that allows you to maintain the desired driving path following a tractor. The frame is fitted with two rotors, which are equipped with thirteen raking arms and autonomous wheel sets with rotary wheels, which allow for a highly precise collection of grass. Its adjustable raking depth helps you to set an optimum raking for various levels of ground hardness. The rotors interact to form a single bank situated on the left side of the machine. This is possible as they are settled one after another relative to the direction of travel. The design of the ZKP900D also enables the creation of two smaller banks. This is possible due to spe-

cially designed telescopic arms, which move the rotors away from each other with double-acting actuators. This increases the operating speed to up to 9 m.

The raked grass hits against the lowered forming shield to create banks with a width ranging from 0.6 m to 1.9 m. In order not to deform the banks, you can lift the components of the ZKP900D slightly above them without disconnecting the impeller drives, which makes the considerably speeds up the operation. This versatile scraper allows you to obtain a perfectly formed swath, which can be easily collected with other machines, such as the self-collecting trailer or the baling press.

The machine is provided with a hydraulic system (used to lift and lower the rotors), which ensures that the rotors can be set in the transportation position. The ZKP900D scraper when prepared for transport does not exceed 4 m in height and 3 m in width, which, combined with its excellent steering system, facilitates manoeuvring and travelling on narrow roads. The scraper is designed to work with category I and II tractors with a minimum power of 80 hpm (59 kW) and a minimum weight of 2500 kg.The ZKP900D double-rotor scraper will extend this range of Pronar machinery, composed of suspended single-rotor scrapers. The ZKP300 with an operating width of 3 m, supplied with eight scraping arms, the ZKP350 (3.5 m; nine scraping arms), the ZKP420 (4.2 m; eleven scraping arms), the hauled scraper ZKP460T (4.6 m; twelve scraping arms) and double-rotor scraper ZKP800, whose operating width is 7 to 8 m thanks to hydraulically extendable rotors (twenty-two scraping arms, eleven per rotor).

Marek Kożuchowski

The author is a designer in Pronar's Implementation Department.

THE PRONAR PDD830C TWO-SIDED DISC MOWER

ENSURES HIGH QUALITY FEED

With its two 3 metre wide cutting units, our rear-mounted, two-sided PDD830C mower can easily mow a very large area in a short time. Each cutting unit consists of a strip equipped with 7 cutting discs. Each disc is equipped with two blades (right- or left-sided, depending on the direction of rotation). The cutting strip is fixed to the mower's frame. By extending the operating unit with a front-mounted PDF300 mower, a mowing width of up to 8.3 m can be achieved.

The Pronar PDD830C scarifier accelerates the preparation and ensures the high quality of feed. Made of abrasion-resistant steel, the mower's fingers catch mowed material ejected from the cutting strip and throw it over the shaft to the scrapers, which for a swath with a width preset by the operator. The process destroys the grass' wax coating and brakes its blades, allowing it to dry more quickly and allowing operators to produce highly nutritional feed more quickly. Scarification intensity is set using the control lever located on the mower casing. The scarifier can be connected or disconnected as needed.

The mower's hydraulic system is powered by the tractor's hydraulic system. The machine is mounted using three quick couplings, two of which connect the control circuits from the left and right control actuators. The actuators acts as hydraulic protection against mechanical damage when running over an obstacle. When this happens, the overflow valve is lifted, pulling the cuttong strip backwards.

Mowing on an incline or an uneven surface is possible thanks to the mower's wide deflection range. The central suspension and adjusted ground pressure ensures very good ground adherence across varying terrain. It allows you for a quicker mowing, improved operation, and enhanced operator comfort. The third quick coupling is used to power the control circuit using load-bearing actuators, which are responsible for lifting and lowering the mower's cutting units. The actuators are equipped with ball valves, which lock the mower in position during transport. Unlike other Pronar rear-mounted disc mowers, the PDD830C can only be transported in vertical position behind a tractor.

The design of the PDD830C makes its operation very simple. Blades and transmission components can be serviced and replaced without removing the cutting strip from the frame, which would require further lubrication of the link joints and cleaning of plant residues from the disk chamber. An example can be the replacement of blades

and the easy access to transmission components located in the driving disc, which makes it unnecessary to dismantle the cutting strip from the frame (when you need to grease the link joints or clean the disc chamber from plant residues).

The range of Pronar rear mounted disc mowers is complemented bythe PDK220, PDT260, PDT300 and PDT340.

Iwona Grygoruk

The author is an international trade specialist at Pronar

PRONAR Z245 IN LUXEMBOURG

WELL KNOWN BRAND ABROAD

The advantages of bale wrappers from Pronar are well known to customers from around the world. No wonder that more and more people are choosing them.

I bought the Z245 bale wrapper in 2016. We could not harvest grass because of the wet season. Therefore, we were left with straw. That is why we decided to buy our own bale wrapper. In my area I have heard about the Pronar brand for a long time and that's why I visited a local Pronar distributor. When the machine was delivered to us, I was surprised by the quality of manufacturing, but what surprised me most was the weight of the bale wrapper, which weighs over 2 tons. What is the main advantage of the machine? I think that its functionality - it is very easy to operate and does not cause problems during operation. Reliability means time saving - each farmer will confirm this. I would definitely recommend the Z245 bale wrapper to my friends and other farmers.

Wester Guy

owner of Pronar Z245 bale wrapper, participant of the Farmer Wants a Wife ("Bauer Sucht Frau") television series in Germany (RTL TV)

DOUBLE-ROTOR RAKE PRONAR ZKP800

THE LARGEST ONE ON STOCK

The ZKP800 double-rotor rake, the largest in the Pronar lineup, offers excellent performance to farms with large green areas. Cut, pre-dried green matter is always raked or turned over by only one rotor. This is an important asset for legumes with delicate leaves such as lucerne and clover.

The Pronar ZKP800 has a special transmission mechanism which provides for adequate rotor revolution and which can be extended using a hydraulic system. This allows for a total operational width of 7 to 8 m, meaning the machine is very efficient. The most important structural components include two rotors with an operating diameter of 3.1 m each. They rotate in two different directions, enabling the raked material to be formed into a single central role.

At the recommended travelling speed of 10 km/h, the Pronar ZKP800 can rake 1.9 wide rolls per hour, over an area of approx. 10 ha. This depends on the shape of the field and the ability to make U-turns without additional driving or disconnecting the machine. Connected with bars, the three-point rear suspension system reduces the turning radius, meaning that the raked material is not excessively torn or compacted during sharp turns, therefore maintaining high quality.

The rear frame is supported by two turning wheels with 10/75-15.3 tyres (wider tyres can be installed on request). All sections of the ZKP800 operate independently, allowing for excellent adherence to uneven terrain. This enables operators to rake uneven fields without losing forage, and with neat and even rolls.

Each rotor can be mechanically adjusted, as can be the raking depth (depending on the quality of the turf). The turning system makes maneuvering easier. Vibration dampers installed in the Pronar rake considerably improve operator comfort. The option to fully adjust the width of the roll, combined with a the clean and tidy rakes area, make subsequent bailing much easier. The rake is compatible with tractors generating at least 80

bhp. Each machine is accompanied by an articulated shaft for connection with the tractor. The rake is transported similarly to a single-axle trailer. When preparing it for transport, the raking arms must be lifted using the hydraulic system to obtain the transport width (2.8 m) and height (3.5 m). To maintain the rake's efficiency and preparedness, manufacturer-recommended maintenance should be performed, including activities as checking the gear oil, tightening loose bolts, and ensuring that no water penetrates into the bearings when the machine is in storage.

The double-rotor Pronar ZKP800 complements our range of single-rotor rakes, including the ZKP300, ZKP350 and ZKP420, with operating widths of 3, 3.5, and 4.2 m, respectively.

Przemysław Rogala
The author is an international trade specialist at Pronar


www.pronar.pl
PRONAR

TRAILERS

CONSTRUCTION TRAILERS ON SCANDINAVIAN MARKETS

GOOD PERFORMANCE IN VARIOUS INDUSTRIES

Monocoque construction trailers (called stonework trailers) are very popular in Scandinavia. With their broad functionality, they are used in such sectors as agriculture, construction, and forestry.

Clients in Scandinavia need special machines due to the specific needs of their short growing season. This forces manufacturers to produce trailers which are versatile and can also be used in other sectors when agricultural works come to an end. This includes construction, including road construction, which are important industries and economic sectors in Sweden and Norway.

Pronar is an experienced manufacturer of various types of trailers, including versatile construction trailers. These products are very popular, and their high quality and the wide range of models have drawn the attention of the Scandinavian customers.

Monocoque construction trailers are mounted to tractors and, as compared to trucks, are more manoeuvrable, especially over difficult or wet terrain. Pronar manufactures the T679/2, T679/3, T679/4, T679/5 and T701 construction trailers. Some of them (the T679/2 and T701) have their load carrying bodies in the shape of a tub with a 10 mm metal sheet floor and 8 mm metal sheet walls.

Wide tyres installed in all trailer models improve operator comfort, ensure better braking and facilitating movement, loading and unloading, even on wet or unstable terrain, and without causing excessive soil compaction. The rear tilt-and-turn flap (optional), installed in Pronar's construction trailers, enables the transport of large-size loads such as rubble or stones. Its opening system, consisting of adjusted chain attachments, allows the operator to precisely set the discharge opening width while unloading.

As standard, Pronar construction trailers are equipped with ladders, platforms for load carrying bodies, and LED lights (secured by metal grids that protect them against damage during loading or unloading).The use of strong fastening hooks, resistant to the deformation of load carrying bodies, allows for the secure transport of farm produce, rubble, stones, gravel, sand, clay or aggregate, as well as construction vehicles such as diggers, loaders, and other machinery. As an option, the body may be made of an abrasion-resistant material, which ensures higher resistance to abrasion and impact, and thus extends the service life.

Pronar construction trailers have gained high recognition on Scandinavian markets. They are appreciated for their versatility, as apart from construction they are also well suited to agriculture and transport. Scandinavian customers value the high quality and functionality of Pronar trailers and give them very favourable reviews.

Marta Topolewska-Baszun

The author is an international trade specialist at Pronar

BALE TRAILERS PRONAR T025 IN PERU

A GOOD PRODUCT FROM A WELL-KNOWN BRAND

Pronar products are regularly exhibited at fairs in Argentina, Uruguay and Colombia and are increasingly popular and recognisable in South America. This is evidenced by increasing exports to the continent. The versatility of Pronar bale trailers and our growing reputation in South American countries have also resulted in increased interest in these machines in Peru.

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Pronar's wide range of bale trailers allows us to meet the needs of farms of various size and at various lattitudes, as is evidenced by the growing number of countries to which we export our products. One example of this is the interest attracted by Pronar T025 bale trailers in Peru. They are intended for transporting bales as well as (after installing additional stanchions) wood and other materials that require trailers of a non-standard length. The suitability of Pronar T025 trailers for work in extreme climatic conditions has been tested in the climatic chamber at Pronar's Research & Development Centre. The trailers' use by Peruvian farmers in desert conditions near the Peruvian town of Ica, where temperatures reach +50^{0}C, has confirmed those results. The praise received by Pronar trailers in Peru is a result of their high quality and exceptional utility. Structurally adapted for transporting bales, T025 trailers are used in Peru to transport onions, which are cultivated there on a massive scale in artificially irrigated fields.

Peruvian farmers expect a wider and more diversified range of agriculture machines. When it comes to selection of trailers, they look for features which meet the needs of their farms. In Pronar T025 trailers, they value the large loading area (16,4 m^2), wide wheels (500/50-17), and solid frames made of enclosed steel profiles resistant to deformation.

Adam Witebski
The author is an international trade specialist at Pronar

LARGE-SIZE TRAILERS

MEET DEMANDING REQUIREMENTS

Regardless of the country, a contemporary farmer requires that his machine meets the expectations not only in terms of high quality but also functionality, reliability, durability, easy operation, appearance and availability of maintenance service. Thanks to meeting these requirements, Pronar has succeeded in the sales of large-size trailers in many countries.

Large-size trailers perform very well at the farms where it is required to transport various types of material. Pronar continuously modernizes its products, which can be exemplified by the improvements made in T669 and T669/1 trailers.

Both models feature a high loading capacity (23 m^3 with 580 mm overboards, and 28 m^3 with 1000 mm overboards), and the enclosed profiles used for their production ensure structural stability and high deformation resistance. A high precision in manufacturing the load carrying body guarantees high tightness, which allows for transporting even fine grains (e.g. rape). The optional three-side dumping mechanism increases the trailer's functionality. Owners of large farms in Western Europe quickly appreciated this line of trailers, praising not only the technical solutions but also the attractive prices.

In response to the high market demand, the company also developed the silage trailer PRONAR T400, used to transport biomass. The engineers from Pronar's Implementation Department devoted a lot of time to develop a design allowing to avoid turf destruction during turning and to achieve a low wear of tyres (compared to a stiff system). The solution includes an axle system consisting of a front stiff axle and a rear turning axle. Additionally, the manoeuvring of this trailer requires a lower motor power. Solid, modern and price-competitive PRONAR T400 trailers found their purchasers just after introduction on the market, in such countries as Germany, Austria or Switzerland. This trailer was a basis for another one: T400R with a rotor. It is equipped with a cam pickup, which allows you to gather biomass without any additional machinery or equipment.

High load capacity is also a feature of tandem axle trailers T700 and T700M. T700M is a modernised version of PRONAR T700.

Its maximum permitted total weight is as much as 23 tonnes (design capacity: 17,000 kg). The high-strength tandem suspension with parabolic springs, axles with a section of 150 mm and drum brakes is adapted to move at a speed of up to 60 km/h. The rear flap of PRONAR T700M has a system of protective signs supported on hydraulic actuators. It ensures lock bolting, thus preventing the flap from accidental opening. Both T700 and T700M feature the highest load capacity among all Pronar tandem-axle trailers, which is up to 35 m^3 (with overboards).

Pronar also supplies the monocoque trailer T682 with tridem suspension (with a rear-side dumping mechanism). The drawbar (mounted on the lower frame) and the loading case frame are made of rectangular sections manufactured using high-strength steel. With these components, the structural stiffness and stability are so high that the trailer's capacity with 580 mm overboards is as much as 32 m^3.

Other products recognised and popular among customers are also: T900 trailer with a sliding wall and its smaller version; PRONAR T902. The sliding wall system provides for easy unloading of transported materials in challenging weather conditions and in small buildings. In addition, the sliding wall enables for pressing materials such as grass and thus reducing the volume of transported mass.

In these trailers, as an option you can install a tridem (T900) or tandem (T902) hydraulic suspension system. These suspensions are sprung by hydraulic system components (with steel semi-springs)

and are hydraulically stabilised and adjusted. An advantage of tridem hydraulic suspension in T900 is the option to lift the front axle.

The customers also value our reloading carriages: PRONAR T740 and T743. The unloading efficiency of both models ranges from 200 to 400 tonnes per hour. Fast reloading, without the need to drive the harvesters to trucks, allows for saving up to 30% of the harvesters' working time, which considerably reduces the harvesting costs.

PRONAR T780 trailer is designed for transport of both farm produce and loads on euro-pallets. A high comfort and safety of the operator is provided by the hydraulic system used to open the sides (installed as an option). The bent profiles with variable sectional geometry allow a very high strength even in the most loaded locations. The applied solutions guarantee the maximum load-bearing capacity of the structure at the optimum weight. The customers may order T780 with additional dumping windows, which increases its versatility even more.

A new large-size trailer in Pronar's range is T701HP. That trailer raised a great interest of the ones who visited Pronar's stand at Agritechnica fair in Hanover. PRONAR T701HP is a self-dumping half-pipe trailer with a capacity of 12.5 m^3 (with the option of extension to 22 m^3). Important convenience for the users is provided by the case's section which extends towards the dumping side. With this, we avoid the adhesion of soil or sand and blocking of load inside. Discharge is smoothly performed by the enormous telescopic cylinder, which needs only 30 seconds to incline the case to 55°. The comfort of use is improved by the shock-absorbed drawbar included as standard.

Pronar's large-size trailers are very popular. Their users notice especially the robust structure and precise execution.

Sławomira Sawicka
The author is an international trade specialist at Pronar

PRONAR T185 AND PRONAR T700M IN LUXEMBOURG

TRAILERS TESTED BY CUSTOMERS

Functionality, high quality and attractive price of Pronar trailers are the advantages appreciated by customers from abroad.

I bought the T185 hook lift trailer in February 2018. Why did I choose the Pronar trailer? I know one farmer who uses the T285 hook trailer and is very satisfied with that trailer. I also saw the T185 trailer while working and had no objections. I found the trailer worth buying also due to its attractive price. I have been using the trailer for six months and I can confidently say that it is easy to operate and I do not have to waste a lot of time on it. Various types of containers and platforms with grass and sand can be mounted on the trailer without any problem. I was surprised by the fact that the trailer with such a simple mechanical suspension ensures very comfortable ride. I recommend this hook trailer to anyone who does not want to spend too much time servicing the trailer.

● *Haas Tom*
PRONAR T185 trailer user

I bought the T700M trailer in 2016. The reason was that I needed a double-axle trailer with capacity of 35m^3. When I was using this trailer for the first time, I was pleasantly surprised that I could see the trailer's wheels and side walls from the tractor cab. This significantly improves the driving comfort, especially, for example, on a field where there are posts or trenches. The large tipping angle, which facilitates unloading, is another advantage of the trailer. What else matters to me? The suspension is very strong and the braking system with automatic braking force regulator (ALB) reduces the wear of tyres. I can save a lot of money in this way - with the ALB option I can use tyres twice as long. As a contractor, I have 5 trailers of which the Pronar trailer is the most popular among my customers. In all conscience, I recommend the T700 M trailer to anyone who needs a strong trailer with a large loading capacity.

● *Kieffer Emile*
PRONAR T700M trailer user

THE PRONAR T028KM BALE TRAILER

A VERSATILE TRAILER WITH A HIGH CAPACITY

The Pronar T028KM three-axle bale trailer with a permissible total weight of 24 tonnes is one of the most functional trailers offered by Pronar. Its advantages include a wide range of applications and an increased load protection.

Pronar offers more than ten models of bale trailers with two or three axles, trailers on tandem chassis, and a self-loading trailer. Such a wide selection of trailers is a result of high demand and allows for customisation of parameters and equipment.

In bale trailers, the load is normally secured by fixing belts, the installation of which requires a lot of time and efford. This is why Pronar responded to customer demand by the T028KM, T028ML, T026M and T026KM introducing bale trailers with hydraulic side walls that protect the load. While the side walls are optional accessories, standard equipment includes retaining ladders with an adjustable inclination angle adapted for transport of bales and cubes. The hydraulically-controlled walls protect the load against falling during

transport. The lateral walls are hydraulically moved and lifted (during loading) or lowered (during transport).

The hydraulic wall control system quickly, conveniently and securely protects the load and completely eliminates all hazards which may be caused by bales falling onto the road. Such a solution allows for a considerable reduction of the time required to secure the load, as compared to the conventional securing using cargo straps. In addition, the hydraulically lifted side walls protect the load more effectively than cargo straps.

An important advantage of the T028KM is that its platform is fitted with special seats (holes) used to install stanchions on each side of the trailer. Stanchions with a height of 1.2 m (optional), combined with the load area of 24 m^2, increase the trailer's capacity and ensure a stable load. With the stanchions, the load weight may be increased up to the maximum total weight of the trailer (24 tonnes). The stanchions may also be removed by the operator, enlarging the platform's loading area.

The Pronar T028KM platform trailer performs very well in the transport of voluminous loads which require large straight areas, i.e. for transporting straw and hay bales, pallets, and long-load materials (such as wooden logs or boards). It combines the functions of bale and forestry trailers. It is a versatile and reliable product which reduces operating costs for both the agriculture and forestry sectors. Technical data and information about the standard equipment and accessories of Pronar trailers are available at www.pronar.pl

Pronar manufactures bale transport trailers with capacities of 10 to 24 tonnes which are very popular in many countries. They include tandem-axle trailers (the T024 and T024M), double-axle trailers (the T022, T022M, T025, T025M, T025KM and T027M), three-axle trailers (the T023, T023M, T026, T026M, T026KM, T028KM and T028ML) and the TB-4 self-loading trailer.

Anita Frank

The author is an international trade specialist at Pronar

PRONAR TB-4 SELF-LOADING TRAILER

LOADING WITH NO ADDITIONAL EQUIPMENT

The Pronar TB-4 self-loading trailer ensures easy loading without additional lifting or loading devices. Its stiff, hydraulically controlled drawbar allows for easy bale access without unnecessary manoeuvres.

With the Pronar TB-4, transport is faster and bale loading is easier. The conventional method of transporting bales requires at least two tractors: one equipped with a bale loader and another with a trailer to transport bales to the storage location. The Pronar TB-4 makes loading bales much faster.

The hydraulically shifted drawbar allows the operator to approach the bales with the front side of the trailer and to move the divided front platform to the left or right side of the tractor. The hydraulic loading then mechanism lifts the bale and places it in the trailer. With the appropriate width of the loading platform (2550 mm), the trailer has a capacity of 12 1200 mm-diameter bales in two rows.

Another great advantage of this trailer is the ability to load bales without interruption. The TB-4 is supplied with a hydraulic collecting and loading mechanism controlled from the tractor, which allows the operator to lift the loading platform and to dump the bales by inclining the platform backwards. The Pronar TB-4 is equipped with a distributor that is placed in the tractor cabin, enabling the coordination of loading and dumping without the operator leaving the cabin.

In addition to the TB-4 self-loading trailer, Pronar also manufactures other bale transport trailers with loading capacities of 10 to 18 tonnes. These include tandem-axle trailers (T024 and T024M), double-axle trailers (T022, T022M, T025 and T025M) and three-axle trailers (T023, T023M, T026, T026M, T028KM and T028ML). These are characterised by a flat steel floor, a loading platform with lateral edges, and foldable openwork walls on the front and rear sides. Their advantages include durability, reliability, and a very low failure rate. With all these features, Pronar trailers are sales successes in many countries and perform excellently on roads, pastures and farmlands.

Marzena Piwowarska
The author is an international trade specialist at Pronar

PRONAR T700XL TRAILER

THE HIGHEST LOAD CAPACITY

Pronar recently introduced the T700XL, a trailer with a capacity of 18 tonnes (admissible total weight: 24 tonnes). Its high load capacity and innovative technological solutions have been noticed both in Poland and abroad. The trailer has received very favourable reviews from experts and potential buyers at various fairs and industry exhibitions.

Based on design solutions used in T700 and T700M, the Pronar T700XL trailer is equipped with walls that are 250 mm high allowing an increased load capacity of 26.6 m^3. It features the highest capacity (18 tonne) among all the monocoque trailers built by Pronar. The use of uniform sheet structure (thickness: 4 mm) over the entire length of the trailer provides increased structural stiffness. With the characteristic embossed areas on the sides, strengthened top edges of the side walls, and chassis frame welded using hollow sections made of high-strength structural steel, the trailer is very durable. The 600 mm high overboards, an optional extra, increase the load capacity to nearly 36 m3, which makes T700XL distinctive in the monocoque trailer segment. The increased capacity of the T700XL allows it to be used both for the transport of bulk materials and as a silage trailer. The trailer's high capacity makes for reduced operating time and costs.

The trailer's design features a tight loading case with a hydraulically operated, rubber sealed rear flap. The flap design employs a proven solution involving hydraulic locks located on hydraulic actuators. With this, the flap is protected against accidental opening, which could result from the high temperature of the transported load.

An undoubted advantage contributing to the higher loading capacity of the trailer is the use of a suspension system supported on parabolic steel springs equipped with Pronar axles with 1500 mm of wheel space and 406x120 drum brakes. The drawbar, supported by a steel leaf spring, transmits vertical loads of up to 4000 kg. The drawbar is adjustable in height and can be connected to the lower or upper hook of the tractor. Owing to these solutions, the Pronar T700XL does not transmit any vibration to the tractor, as is the case when stiff drawbars are used. The tandem wheel set ensures stability and versatility on various road surfaces.

In addition to T700XL, Pronar also manufactures other monocoque trailers: the T679, T679M, T669/1, T700 and T700M.

Michał Bobkowski
The author is an international trade specialist at Pronar

HERKULES SPREADER

HIGH FUNCTIONALITY AND COMPETITIVE PRICING

Pronar manufactures various models of agriculture trailers, including spreaders. The Herkules manure spreaders are designed for uniform spreading of all types of manure, lime, peat, compost, wastewater sludge, and semi-liquid materials. The Profi Line versions of the Herkules N262 (with a capacity of 12 tonnes) and Herkules N262/1 (14 tonnes) are the largest tandem-axle manure spreaders offered by Pronar.

The Herkules N262 and N262/1 spreaders are equipped with AH20 adapters which include two horizontal shredding drums with strong sectional screw profiles and two spreading disks with adjustable blades. The adapters effectively shred fertilizer (leaving no lumps) and spreads it over a wide area (depending on fertilizer type), at a range of 12 to 25 metres. Optimum spreader operation requires a PTO shaft with a speed of minimum 1000 rpm. Appropriate distribution (e.g. a fertilizer) is achieved via a flow controller located on the distributor.

Excellent for the largest farms, the Pronar Herkules N262/1 spreader can spread all types of manure, lime, peat, compost, sludge and semi-liquid materials. This model is particularly strong and durable – it is equipped with a 1265 mm case and a capacity of 14 m3, as well as a strengthened conveyor including four solid floor chains with 14 mm thick links. The spreader's movable components are covered with stiff and tiltable covers, which ensures operator safety and fail-safe operation.

The use of chains which tensioned by specially reinforced springs is another important technical solution. The hydraulic drive of the floor conveyor is equipped with a speed control system. The design, allowing adjustment of the angle of the spreader disk blades depending on the type of substance, guarantees an optimum spreading range of up to 25 metres. The chassis of Herkules N262/1 consists of a tandem wheel set with a spring suspension and 600/50-22.5 wheels designed to work under very difficult conditions (optional equipment includes 600/50R22.5 tyres). Low-pressure profiled tyres ensure very low soil penetration and compaction. The power transmission mechanism is protected against overload by a friction clutch and one-way clutches. The movable components of the manure spreader are covered by a stiff, hydraulically tilted guard. The warm shafts are supplied with replaceable screwed blades. Quick dismantling of the blades minimises spreader downtime. The possibility to adjust the angle of the spreader disk blades based

on the type of manure ensures an optimum spreading range.

During the last year's Agritechnica fair in Hanover, Pronar presented its Herkules N262/1 spreader . Its modernised Profi Line version is equipped with a turning axle and a strengthened slide damper. These improvements were noticed and appreciated by many visitors. Pronar's Profi Line versions are distinguished by a design that allows for year-round operation in many sectors. Apart from Herkules N 262/1, a Profi Line version is also offered for the Pronar T701HP construction trailer.

Marta Kuligowska
The author is a specialist in international trade at Pronar

NEW CONSTRUCTION TRAILER: THE PRONAR T701HP

PROFI LINE FOR THE MOST DEMANDING CUSTOMERS

Pronar has started the production of the Profi Line version of the T701HP, a self-dumping half-pipe construction trailer. It was first presented at the 2017 Agritechnica international fair in Hanover and attracted great interest both in the construction and agricultural industries. Pronar's Profi Line models are distinguished by a design enabling year-round operation in various industries, and not only in agriculture, where certain machinery is used less frequently outside the growing season.

The development works on the new trailer were started in response to suggestions from various companies from the aforementioned sectors. Thanks to a low kerb weight (5.5 tonne), the Pronar T701HP construction trailer, with an admissible total weight of 22 tonne, ensures a high load capacity (16.5 t). It performs well on difficult terrain, especially during large road projects, in gravel pits (transport of bulk materials, rocks and stones), or in transporting rubble and asphalt. It is a trailer for the most demanding clients who are looking for a trailer with high performance parameters.

Combined with a tractor, the T701HP is a perfect substitute for conventional trucks. It is much more manoeuvrable and can better handle swampy or otherwise difficult terrain. Additionally, it is cheaper to operate such a set than to operate lorries or dump trucks. The trailer is also more versatile, as, thanks to the use of wide 600/55R26.5 tyres, it can also be used in agriculture.

One of the main advantages of the T701HP is the semi-circular cross section of the load case (which extends towards the dumping side). This design allows for effective discharge of the load during dumping (there is no adhesion of soil or sand, and the load is not blocked). The standard capacity of T701HP Profi Line is 12.5 m^3, and after installing the 800 mm overboards (optional), that increases to 22 m^3. The trailer's cover is made entirely of a high-end abrasion-resistant sheet with a thickness of 6 mm, providing increased durability and resistance to abrasion. This ensures a long service life and enhances its resistance to bumps, impact

and the adverse effect of weather conditions or chemicals.

The use of half-pipe design has reduced the trailer's kerb weight and increased its loading capacity. With a lift capacity of 25 tonnes, the enormous telescopic front cylinder can easily empty the case in only 30 seconds. During dumping, the actuator needs approximately 41 litres of oil. This requires an efficient pump and hydraulic system. Therefore, the trailer is equipped with a two-channel hydraulic system, ensuring fast draining and supply of oil to the actuator, while the high-quality sliding sleeves provide safety and support during dumping. Additional equipment provided for the T701HP construction trailer includes a drawbar with shock dampening. Its two springs take over the impact force acting against the tractor. Such a solution eliminates unpleasant jerks and protects both the operator and the trailer itself. As an option, a hydraulic spring drawbar can be installed, further increasing operator comfort.

The height of the T710HP's drawbar stand is adjustable, allowing for connection to tractors supplied by different manufacturers. With parabolic springs, wheel space of 1900 mm, and a large deflection angle, the boogie suspension performs excellently on unstable ground. The rear flap of the trailer is opened by the hydraulic system. It may be completely lifted, making it much easier to dump large stones or rocks, and its self-alignment facilitates quick reset after dumping.

In the range of construction trailers, apart from the T701HP, the T679/2 and T701 trailers are also available in Profi Line version. In addition to the T701HP, the Profi Line also includes Herkules N262/1 spreader with a loading capacity of 14 tonnes.

Przemysław Rogala
The author is an international trade specialist at Pronar

TECHNOLOGIES

RESEARCH & DEVELOPMENT CENTRE: PRONAR'S SHOWPIECE

WHERE INNOVATIONS ARE BORN

Pronar's Research & Development Centre, a modern and innovative research institution, conducts tests that streamline production processes and facilitate the technologies used to implementing new products and improving existing ones.

The Pronar RDC includes modern laboratories equipped with high-end specialist equipment used for certified testing and measurement activities and to verify the production materials supplied to Pronar.

The RDC carries out such activities as testing material quality parameters, testing structural strength and protective devices, and static and fatigue tests. Pronar offers unique test services at competitive prices.

The availability of such advanced testing equipment and the appropriate exchange of information between departments allow for a quick execution of orders and testing the delivered components in an environment which is similar to real conditions. Since such comprehensive and varied tests are performed in one location, clients receive their results sooner and at lower prices.

Beyond simply providing testing services, the RDC provides benefits in the form of innovative solutions applied in Pronar's machines and trailers. One example is the strength test for different

The metallographic testing station allows for testing the micro-structure of metals and their alloys, e.g. analysis of grain size, inclusions, porosity, cracks and other material flaws

The UV chamber enables the simulation of changing weather conditions, e.g. temperature, UV radiation and humidity

product variants, which allows reduced raw material (steel) consumption while maintaining the required product strength. The RDC has implemented friction welding technology in the design of braking systems and hydraulic actuators. This allows for a quick, precise and durable connection of materials with various properties, shapes and sizes.

With the opportunities provided by the RDC, bold ideas inspired by business challenges and proposed by engineers are transformed into real solutions implemented in manufacturing processes.

The search for innovative solutions and new technologies is the basic means of development. However, expanding expertise through research activities is not the goal in itself, but rather a means to offer better products and greater facilitate client operations.

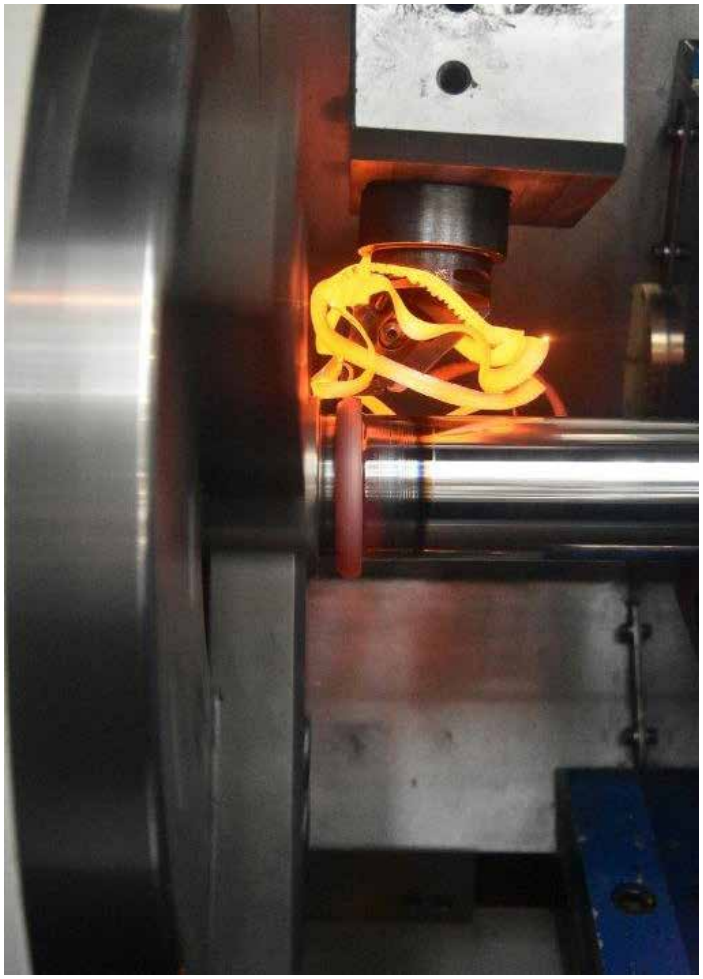
This will be possible, among other means, by developing collaboration with higher education institutions and implementing common research projects whose results can then be used in the production of new machinery.

The UV chamber enables the simulation of changing weather conditions, e.g. temperature, UV radiation and humidity

● *dr Mariusz Mazurek*

The author is a specialist for research and development of the Pronar Research and Development Center

The chemical laboratory conducts quantitative and qualitative tests as well as analyses of the composition of washing solutions and other substances used to produce mixtures



The abrasion welder enables permanent welding of components via abrasion of their respective contact surfaces

The Research and Development Centre (CBR) was one of Pronar's most important investments in recent years. This investment considerably increased the company's recognition on foreign and Polish markets as well as the confidence in its products. The centre ensures research on the highest level based on advanced technologies.

Production process in Pronar

1. Launch of a new project

Constructors carry out conceptual work and calculations with the FiniteElement Method. The result of their work is a 3D model with technical documentation.

2. Performance and validation of the project

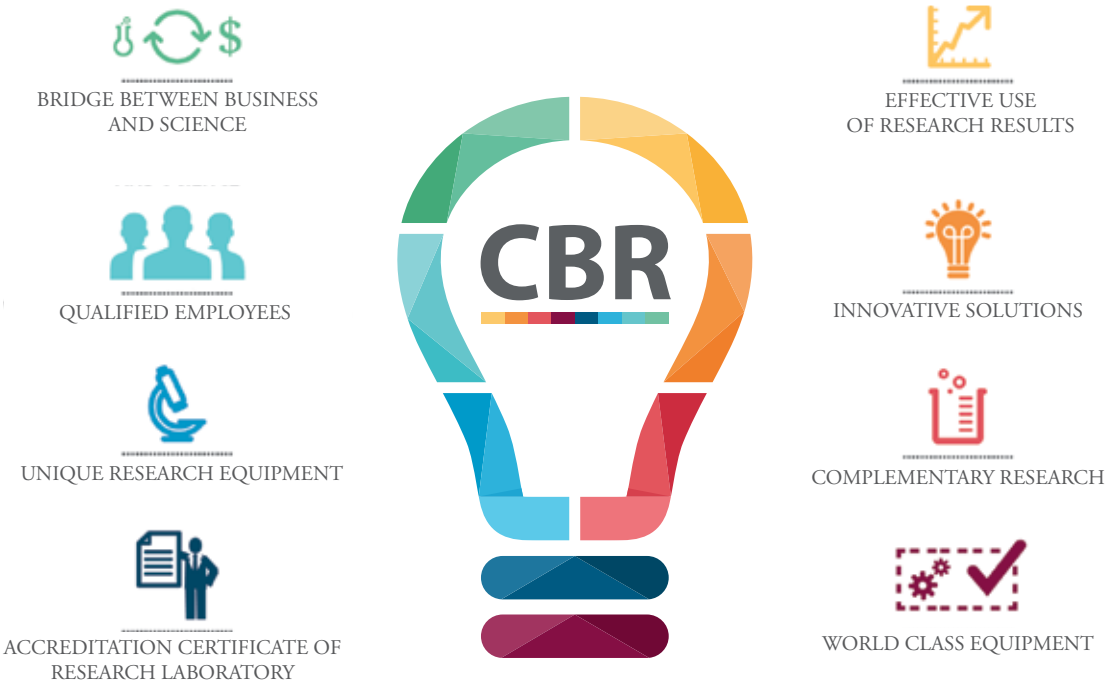
PRONAR has its own prototype construction hall with additional test production and research stands.

3. Analysis of test results

After performing endurance, functional and durability tests, the results are interpreted by the experienced researach team.

4. Implementation of a new product

PRONAR is able to compete with international players in terms of quality and assortment.



Research and development center

WHAT WE DO?
Research and Development Centre, being an engineering and research base, is dedicated to creating innovative technology solutions and supporting the development of the PRONAR products.

DEVELOPMENT AND INNOVATION
The pursuit of continuous development through activities focused on innovation and improvement of production processes is the key element of our strategy.

MANUFACTURING OF SIDE PROFILES

INNOVATIVE LASER-BEAM WELDING

Laser beam welding is an innovative technology used by Pronar for the production of side profiles. It allows profiles made of metal and alloys to be joined in a manner not worse – and often better – than electron beam welding.

The process of laser beam welding consists of melting the contact area to be joined using the heat of a concentrated beam of coherent light with an extremely high power density. In directing the laser onto the component through a system of diaphragms, mirrors and optical elements, the light beam is focused on the welding area. Laser beam welding uses two techniques: puddle welding and keyhole welding. As with electron welding, laser beam welding requires no filler material.

Puddle welding with a CO_2 shield involves the use of a low or medium power laser, which heats the welded surface by absorption and the subsurface by conduction. In this case, the penetration depth depends on the physical properties of the welded metal, its surface condition, and the power density of laser beam. This method is used at Pronar.

Basic parameters of laser beam welding:

- power of continuous laser beam,
- laser light pulse energy,
- laser light pulse duration and repetition rate for pulse welding,
- welding speed,
- length of laser beam relative to the joint,
- type and flow rate of shielding gas,

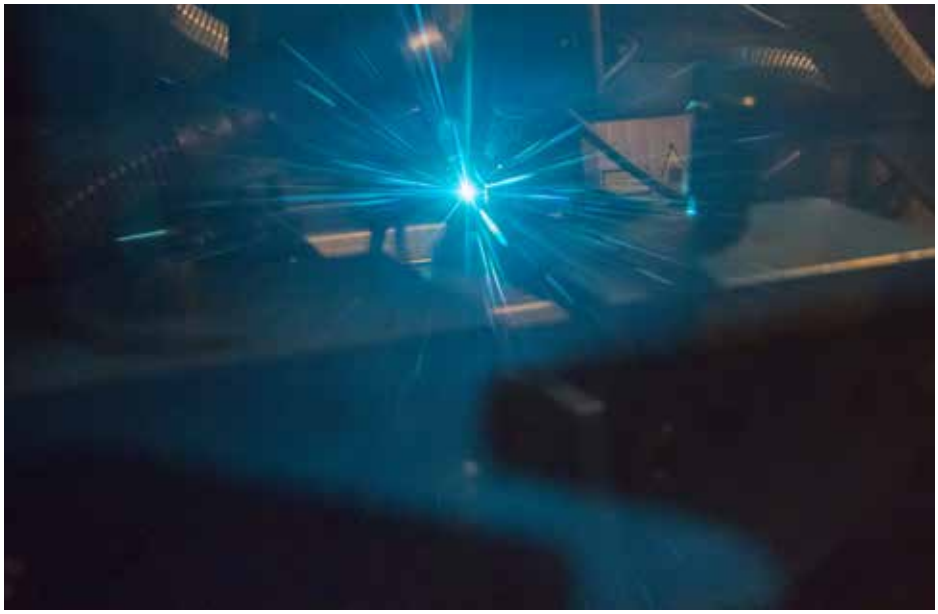
Benefits of the laser beam method used by Pronar:

- narrow heat-affected zone, reducing material deformation,
- neat weld appearance (elimination of finishing treatment),
- high process speed and purity,
- excellent results for welding carbon steel, acid-resistant steel, and low-adhesion materials,
- various joint geometries,
- no filler required,
- possible combination with other welding methods,
- easy process automation.

The use of laser beam welding is one of the important factors which contribute to the high quality of Pronar products.

Rafał Pilarczyk

The author is an international trade specialist at Pronar



A production line operator modifies welding parameters based on the profile thickness and shape

The high quality of the laser-welded joint is visible with the naked eye

PRONAR SIDEBOARDS ON THE GERMAN MARKET

IMPRESSIVE GROWTH

The German agricultural machinery market is the largest in Europe. More farm tractors and trailers each year in Germany than anywhere else in the European Union. In Germany, there are agencies and sales networks for all important agricultural machinery manufacturers. We also can't forget about German manufacturers, who often set trends in the design of these machines.

The German market is very demanding. Machines sold to German clients must feature high production quality. It is not a market where the lowest price wins. For an imported product to compete, its quality must be at least equal to its German equivalent. Given that, it is all the more inspiring that Pronar is ranked third in of the number of new trailers registered in Germany, ahead of many German manufacturers.

Side profiles are important components of agricultural trailers, so Pronar's quality control department pays great attention to the production of these elements. This guarantees that the sideboards supplied to the clients also meet the highest global quality standards. It also allows the company to supply trailers to customers from the most demanding markets, such as Germany. The profiles are manufactured on a modern production line, ensuring quality and repeatability. The use of innovative laser-beam welding to form continuous joints between the upper and lower bases and the profile ensures that Pronar's products look good and are high quality and durable.

Thanks to high quality, attractive pricing, and a flexible approach to the client needs, Pronar products are extremely popular. These qualities also allow us to effectively compete on new markets against strong manufacturers from Germany or Austria.

Pronar cooperates with companies from the Czech Republic, Romania, Ukraine, and Ireland. We are also glad that Pronar sideboards are popular on the demanding German market. Pronar has been present in that country since 2014. Despite the economic fluctuations in the recent years, we have achieved sales growth in Germany every year. In 2015, the sales grew by 35% compared to the previous year, and in 2016 by 40%. In 2017, sales growth recorded by Pronar was an even more impressive 60%.

Pronar is the main supplier of side profiles to more than ten German manufacturers of agricultural trailers and car bodies. A team of experienced sales representatives continuously works to win us new customers. In the upcoming years, we plan to increase our share on the German market for side profiles by gradually extending our product range and further improving product quality.

Mariusz Grygoruk

The author is a sales specialist at Pronar's Sideboard Production Department

ELECTRIC ACTUATORS COMPONENTS

IMPROVING MACHINE QUALITY

Taking advantage of innovative technologies, modern machinery, highly qualified personnel, and a creative design office, Pronar's Pneumatics & Hydraulics Department (P&H) creates state-of-the-art actuators supported by electronic components.

Pronar's hydraulic actuators are recognised by customers worldwide. They are installed not only in Pronar machines but also in many other products supplied by well-known manufacturers. The hydraulic components produced at Pronar are distinguished by high quality and reliability, which ultimately translates into the efficient and economical operation of the machines in which they are installed. Pronar actuators meet the highest quality standards, which is proven by recognition of our customers and by the many awards we've received at industry events.

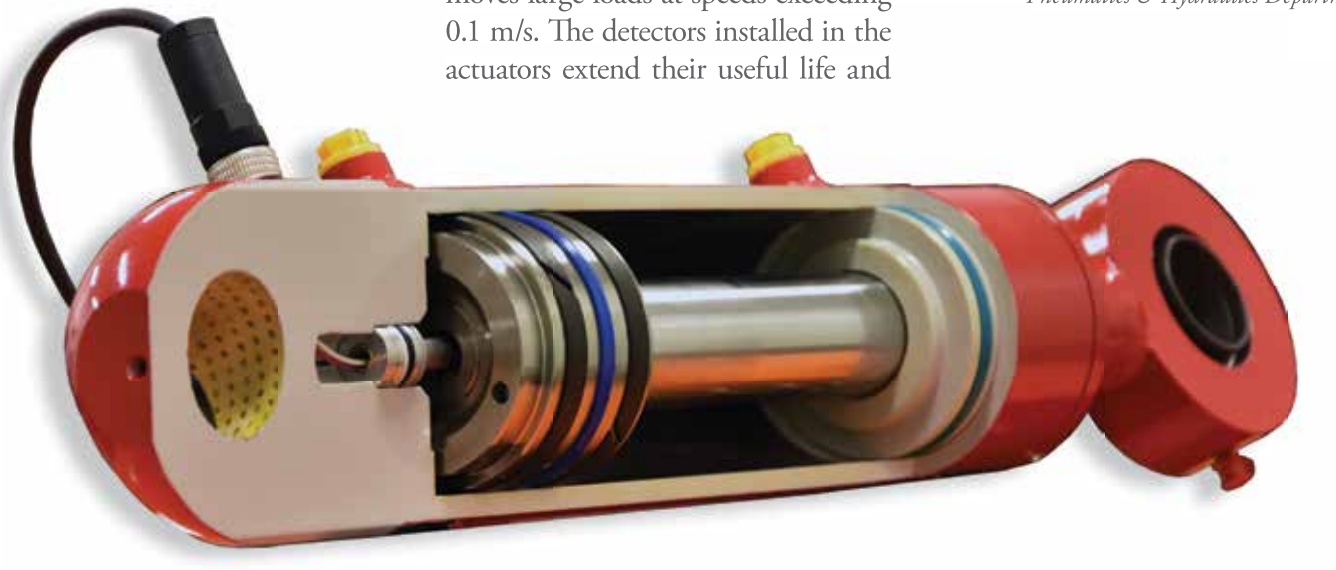
Combining the technological capabilities of the P&H Department with efficient identification of market demand, our constructors have designed innovative actuators equipped with high-tech control elements. These include actuators equipped with magnetic line-and-position detectors whose piston speed is measured in a range from 0.025 to 10 m/s with repeatability of 0.001% of a full stroke. The detector allows for a precise tracking of the actuator's piston. The detector's high pressure resistance (up to 690 bar) allows it to be used in most actuators manufactured by Pronar.

Also, final piston breaking is an increasingly popular design solution used in actuators. The actuators are designed with elements which slow the piston at its extreme positions, which is particularly important if the piston moves large loads at speeds exceeding 0.1 m/s. The detectors installed in the actuators extend their useful life and increase the operating safety of machinery.

Actuators with electronic elements are installed in many machines supplied by Pronar. They help to meet the strict standards manufacturers need to meet in order to serve customers on the global market.

Michał Niwiński

The author is a trade specialist at Pronar's Pneumatics & Hydraulics Department



PNEUMATICS AND HYDRAULICS DEPARTMENT

AN INTERNATIONALLY RECOGNISED MANUFACTURER

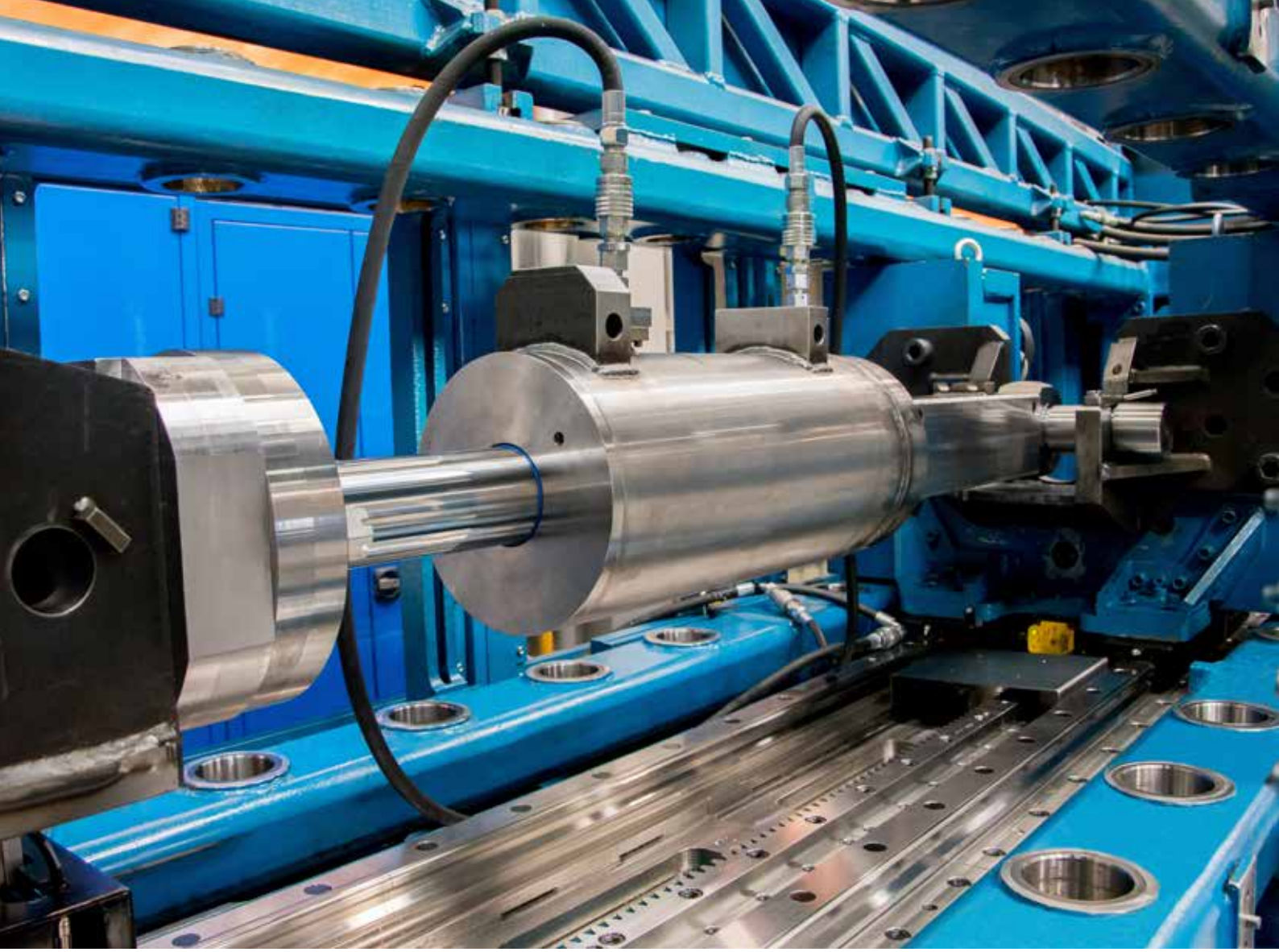
The Pneumatics and Hydraulics Department was established in the spring of 1997. In the beginning, they used single and multi-spindle turning machines to produce ferrules used in the manufacture of flexible hydraulic ducts. In 1999, the machinery fleet was modernised and extended, which enabled the production of hydraulic actuators.

Over time, Pronar became an internationally recognised manufacturer of telescopic actuators, which are the most recognisable products made by the P&H Department. Their top quality and high reliability are proven by a continuously growing interest and the number of purchase orders. Being one of the companies that set the directions for the worldwide pneumatics and hydraulics sector, Pronar constantly extent their production and product range. They are applied in agricultural and construction machinery or in the transport industry. However, the P&H Department does not only produce actuators. It also manufactures other components of hydraulic systems used in modern machinery and equipment. These include hydraulic ducts offered in flexible and stiff versions (DN6 to DN51 with up to six braids). The length of a complete duct may be up to 40 m. At the client's request, the duct can be fitted with terminals made in metric or imperial units.

The technological level of the Pneumatics & Hydraulics Department makes Pronar one of the European leaders in modern methods of producing hydraulic actuating components. The machinery, equipment and innovative processes used at Pronar ensure the high quality of products, which can be offered at very attractive prices.

The products can be manufactured in the following stages:

- Machining. Pronar have several dozen digitally controlled turning lathes and turning/milling centres (in handle and rod versions), which allow



for the machining of details with a diameter ranging from less than 20 mm up to over one meter and a turning length of even 6 m. Since the turning/milling centres use various tools (their proper selection allows the company to create units used to manufacture even the most complex products), a catching spindle and Y-axis machining, at a single station they can make components with a complicated design.

The milling process, being one of machining methods, is performed with the use of modern machine tools provided with a pallet replacement system, which allow for machining in 5 axes. It is possible to machine small details as well as components with a size exceeding 1 m^3.

- Grinding and polishing. The Pneumatics & Hydraulics Department widely uses centre-type and centreless grinding and polishing. Pronar have a modern grinding and polishing line supplied with an automated loading and collecting system, which allows for centreless grinding and polishing of hydraulic actuator components. It is a production line being unique in the European industry; it was tailor-made just for Pronar.
- Welding. This is also one of the key stages of the production process at the P&H Department. It is carried out using TIG and MIG/MAG methods. The welding shop is equipped with devices for longitudinal and circumferential welding, both horizontal and vertical.
- Painting. The P&H Department has a modern painting shop. It is designed for painting of hydraulic actuators, pressure tanks and other components manufactured by Pronar having appropriate sizes. The painting shop includes shower washing stands, dryers, the so-called paint kitchen, lacquering cabins, a wastewater treatment plant, an automated station for internal lacquering of pressure tanks, and and automated circular conveyor.

The design of the painting shop allows for offering products with any coating colour (according to RAL range). The use of such innovative solutions by the painting shop's process line makes Pronar one of the European leaders in terms of modernising the production processes.

Aside from the serial production items, at a special request the P&H Department makes innovative actuators with a high degree of structural complexity, which meet the highest quality and operating standards. Extreme care for quality at each stage of the production process, an implemented and fully operational quality management system in line with ISO standards and an in-house technology and design office allow Pronar to perform even the most technologically advanced orders while maintaining the top quality levels.

To improve the functionality of their products, Pronar also started to manufacture hydraulic cylinders provided with modern control elements. They are actuators equipped with such items as ferromagnetic linearity and position sensors or piston braking systems. Due to continuous investment, the Pneumatics & Hydraulics Department is provided with high-tech machinery, which allows for the implemtation of innovative production processes which are one of the factors of our global success.

Paweł Szutkiewicz

The author is the Head of Pneumatics & Hydraulics Department

QUALITY CONTROL STARTS AT DELIVERY

PRONAR ONLY PAYS FOR HIGH QUALITY

A product is only as good as its weakest link. Therefore, at Pronar we attach great importance to the selection of component suppliers. Though we value price and lead time, but the most important factors are quality and conformity to our standards.

All suppliers must comply with our requirements. At Pronar, we only pay for top-quality components which satisfy our standards. You'd expect this to be common knowledge in the industry, but if that were so, Pronar wouldn't have to hire quality inspectors responsible for deliveries or buy special measuring and diagnostic equipment, thereby saving a great deal of time and resources. Experience tell us that the reality is very different.

Pronar guarantees the highest product quality. This commitment implies responsibility for the quality of components received from our suppliers. The quality control system covers around 4,000 components that are subject to 'Technical Inspection of Delivery' manuals. The inspectors check the key characteristics and the most important dimensions of each delivery, detecting any irregularities. They check a specific sample delivery (depending on delivery volume and supplier reliability); based on the results of such inspection, the whole batch of goods is released for production or returned to the supplier.

Delivery inspections conducted at Pronar should only confirm the high standards ensured by suppliers. Unfortunately, it sometimes happens that delivered components do not meet all of Pronar's standards and absolutely cannot be used for production. In that case, if we cannot reach an agreement on quality improvement, we must terminate our relationship with the supplier. The rules are tough, but these are the only rules we can afford.

It doesn't matter if the supplier is a local or domestic company or comes from a different part of the globe, or whether it's a small business or a large corporation – the most important factor is the quality of their goods and services with due regard to attractive pricing and timely delivery. It is only such best enterprises that can count on long-term and fruitful cooperation with Pronar.

Irena Odyjewska-Mieleszko
The author is a representative of the Integrated Management System Director at Pronar

THE WHOLE WORLD RIDES ON OUR WHEELS

PRONAR IS THE THIRD LARGEST MANUFACTURER OF WHEELS FOR TRACTORS, HARVESTERS, TRAILERS, CONSTRUCTION MACHINERY, MUNICIPAL EQUIPMENT AND FORESTRY MACHINES

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