



MORE
THAN
TOOLING.



ALL YOU NEED TO KNOW IN ONE PLACE!

- quick access to the full product range
- simple and pleasant operation
- modern solution
- reduced paper consumption for the sake of the environment



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WELCOME TO ADAMUS

We are a leading manufacturer of punching tools and spare parts for tablet presses, capsuling machines and blister packaging machines used in the pharmaceutical and industrial sectors.

More than 40 years of experience have allowed us to specialise in the manufacture of punches and dies and to be recognised as a **leader in providing technology solutions** that help customers solve their most challenging problems in tablet manufacturing.

Our company's strategy, embodied in the slogan "MORE THAN TOOLING", includes professional integration of tools with technology, which consists not only of **top-quality products** but also of **services supporting** our customers' operations at every stage of production.

We are committed to delivering them at a competitive price with short lead times.



OUR OFFER

- punches and dies
- spare parts for tablet presses and capsuling machines
- format parts for blister packaging and cartoning lines
- fully automated machines for inspection of punches and dies
- polishing machines
- ultrasonic cleaners
- service of tablet presses
- refurbishment of tablet presses
- refurbishment of turret
- tablet design
- training
- Punching Tools Academy



WE DELIVER QUALITY

We face engineering challenges every day in order to provide our customers with ready-made and proven solutions to increase their production efficiency.

Thanks to our state-of-the-art machinery park and robotic production lines, we enjoy a reputation of being one of the most recognised suppliers in the world.

We ensure the highest quality of products and services through our highly qualified personnel working in accordance with **ISO 9001:2015** and **ISO 13485:2016** Quality Management Systems.







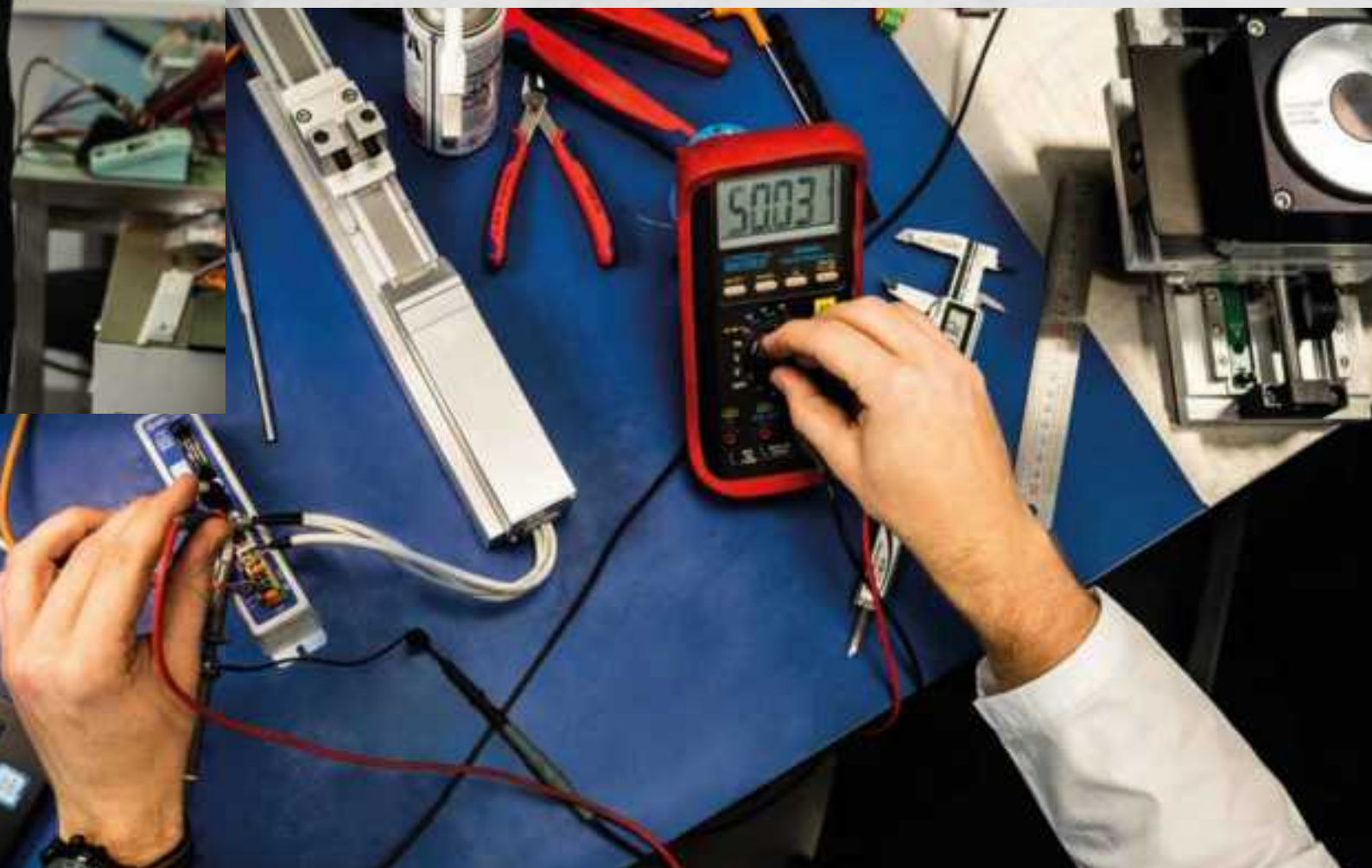
MORE **THAN** TOOLING.



WE CREATE INNOVATION

At our Henryk Adamus Innovation Centre, alongside the West Pomeranian University of Technology in Szczecin, we take on the most difficult challenges.

We are constantly implementing further improvements to meet the needs of the pharmaceutical market. The founder of the company, **Henryk Adamus**, initiated the continuous development and implementation of modern engineering thought. By naming our **Innovation Centre** after him we honoured his visionary work.





WE ARE THERE FOR OUR CUSTOMERS

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Our extensive sales network spanning almost all continents allows us to enjoy the reputation of being one of the largest and most recognised suppliers of punches and dies in the world.



TRAINING AND PUNCHING TOOLS ACADEMY

We organise training sessions for our customers, during which we share our many years of experience. We advise our customers not only on the proper maintenance of punching tools, but also on identifying operational problems, which are the most common causes of defects in tablet production.





ENVIRONMENTAL RESPONSIBILITY

We take care to coexist harmoniously with the environment, taking numerous **measures to minimise the impact on the surroundings**. We feel a shared responsibility for the company's immediate environment in terms of natural resources, yet we are also aware that a global network of manufacturers is only as strong as its weakest link, so at every stage of manufacture, maintenance, logistics or disposal, we are mindful of caring for the environment and minimising adverse impacts.

The scope of our activities include:

- using modern and eco-friendly technologies
- controlling and limiting the pollutant emissions
- monitoring production processes and their impact on the environment
- rational management of raw materials
- promotion of environment-friendly attitudes and environmental education of employees
- developing and using reusable packaging for the transport and storage of manufactured components or alternatively recyclable packaging



SOCIAL RESPONSIBILITY

We support young people in getting their first experience in the labour market. We have been cooperating with secondary schools and higher education institutions for practical trainings and internships for many years. We arrange internships for higher education students and apprenticeships for high school students in the manufacturing area.

Our programmes for students, undergraduates and graduates are a unique opportunity to gain valuable experience and knowledge in a company with a world-leading market position in the precision steel processing industry.

We are a Szczecin-based company and, because of our origin, **we want to be close to local issues**. We get involved in various events and undertake sponsorship activities for the benefit of local communities.

As part of our activities, **we support athletes**, mainly in the area of equestrianism. Being aware of the needs faced by young, talented riders, we help them to develop their passions.



We also invest in our employees through projects to improve their professional qualifications. We focus particularly on shaping a positive corporate image through, among other things, employee programmes.

We also care about what our team members think about work, providing good conditions and competitive pay. We started with a team of a few people and today boast **over 160 employees**. Many of us are proud of working 30 or more years for our company.

Take a minute to get to know us and discover what we have in common with ADAMUS S.A.!



MEET OUR AMBASSADORS

Contact us to get answers to any questions you may have about our products. Specialised staff are always ready to provide help and support. Our knowledge and passion ensure that even the most difficult problem is solved swiftly and effectively.

We can also assist with the arrangement of transport, in which we have many years of experience. We grant a guarantee that the ordered **products will arrive quickly and safely** at their destination. We optimise delivery logistics and tailor each case to individual needs.



HOW CAN WE HELP YOU?







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PUNCHES AND DIES



PUNCHES AND DIES

Punches and dies as a key element of the tablet formulation process. They are responsible for the final appearance and shape of the tablets manufactured, so they must be designed and manufactured with great accuracy and care. During operation, tools are exposed to significant static and dynamic forces. They often press abrasive or corrosive powders, which requires the use of high-quality steels, appropriately selected heat treatment, often coating with special coatings to prevent rapid tool wear or tablet sticking, or the use of special materials such as carbides.

Some applications (e.g. household chemicals or effervescent tablets) require the use of plastic inserts, such as Teflon or vulkollan, which further protect the pressing section and are a consumable component that can be replaced. ADAMUS S.A. designs and manufactures punches and dies for tablet presses of all types, according to EU (ISO), IPT (TSM) or specific tablet press manufacturers' standards, according to customer

needs. Our range includes tools for the manufacture of round and shaped tablets, monoblock and foldable, single- and multi-tip tools.

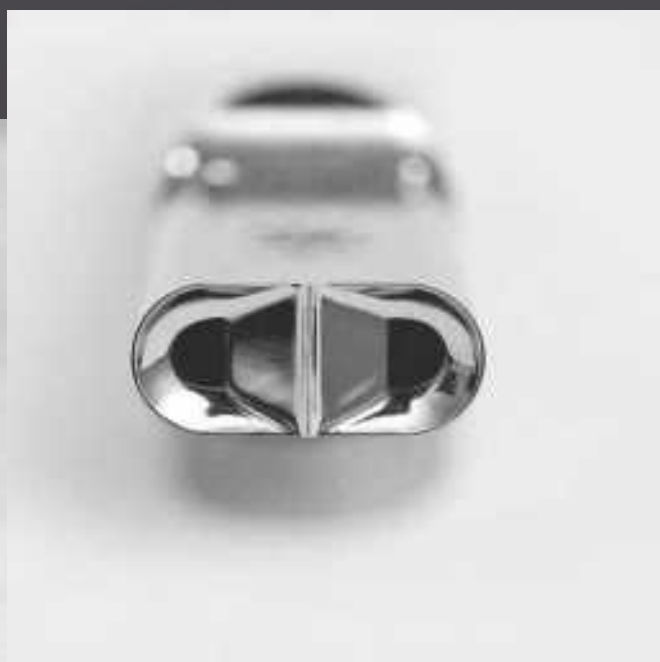
The tools can be supplied in special plastic boxes suitable for later storage. Each batch shipped is accompanied by a measurement record covering 100% of the tools delivered.



TOOLS FOR STANDARD TABLETS

Depending on the customer's requirements, the tools make it possible to produce round or shaped tablets, smooth or with a dividing line, symbols, inscriptions or logos. On request, the tablet pressing part of the punch or the entire punch can have a chromium plating or PVD coating.

The dies we manufacture correspond exactly to the standards of the punches we make, enabling the tools to work perfectly together in the tablet press. On request, the dies can be provided with conical inlets on both sides of the bore, which greatly facilitate the venting of the powder during the pressing process, reduce the forces that push the tablet out after pressing, and reduce the rate of tablet expansion, thus reducing the risk of capping.





TOOLING FOR NON-STANDARD SHAPE TABLETS

With the appropriate design software and the manufacture based on digitally controlled machines, we also provide punches and dies with shapes more complex than those normally used in the pharmaceutical industry.

The only limitation to the variety of these shapes is the strength of the tools and the technological limitations of the tablet formation process. When developing new tablet shapes and forms, we remain open to collaboration, both with the **marketing and R&D departments** of our customers. The design of 2D and 3D tablets by an experienced team of engineers always takes into account the individual needs and expectations of our customers. Also with them in mind, our proprietary **TabGen programme** was developed, enabling buyers of products to verify their designs before starting the manufacturing process.



MULTI-TIP TOOLING

The use of high-quality multi-tip tools supplied by ADAMUS S.A. is an excellent way to increase the yield of tablets manufactured without the need to invest in new tablet presses, thereby increasing operating profit by:

- reducing labour costs
- reducing operational costs
- reducing energy costs
- reducing investment costs

Multi-tip punches are available in two different configurations:

- foldable design — with interchangeable punches
- monoblock structure

The choice of configuration depends on the type of application, the customer's requirements, its internal procedures and the technical feasibility (tablet size and tool dimension standard). When using multi-tip tools, the number of tablets produced per revolution of the tablet press rotor should be a multiple of the number of punches in the multi-tip punch, however, due to the need to reduce the rotor speed slightly to properly fill more die holes, the actual yield is slightly lower.

Depending on the characteristics of the tablet powder, the measured **increase in yield** can vary from product to product, with average values of approximately 1.5 for two-tip tools, 2.8 for four-tip tools and 4.5 for six-tip tools. The values may vary depending on the product being in the process of tablet formation.





SPECIAL STEEL

The principal conditions for steels used in the manufacture of punches and dies are high abrasion and fracture resistance, good compressive strength and favourable heat treatment parameters, including full hardening properties, high hardness after tempering at high temperatures and good dimensional stability during hardening.

ADAMUS S.A. uses only steels meeting the aforementioned requirements, supplied by leading global suppliers, for the manufacture of tools.

Apart from the standard steels used by all tool suppliers, ADAMUS S.A. has a range of special steels to eliminate problems that can occur when forming abrasive, adhesive or corrosive products, or that require higher compression forces than those resulting from the geometrical dimensions and shape of the tablet. These steels, combined with appropriately selected coatings, surface finishes and very tight dimensional tolerances, make the tools supplied by ADAMUS S.A. some of the best in the world.





SPECIAL TOOLING

ADAMUS S.A. offers a wide range of solutions geared to specific customer requirements. As a result, we are able to produce the highest quality special tools:

- rotating head punches
- carbide tools and tools with ceramic components
- ring tablet press tooling
- large-size tools



ASMT



ASMT

ADAMUS S.A. has developed a unique solution to counteract the problem of adhesion called Adamus Special Mechanical Treatment (ASMT).

This mechanically advanced preparation of the surface creates a special anti-adhesion surface on the punch bowl for tablet production, preventing adhesion by reducing the vacuum between the tablet and the punch bowl.

The solution has proven its functionality and performance in many cases of pressing powders with adhesive properties.





PUNCH COATINGS

ADAMUS S.A. is constantly looking for innovative solutions to improve the degree of hardness of the surfaces of tools used in the manufacturing process using substances with different properties. Higher abrasion resistance, reduced coefficient of friction, minimised tendency to tool seizure, and increased corrosion resistance and anti-adhesion properties that eliminate sticking, are the result of our continuous research and development of tool coatings, the quality and durability of which are crucial for our customers.

CHROMIUM PLATING

The most common method of surface protection is chromium plating, which is ideal for many standard applications. The coating is applied using an electrolytic method in a sulphate bath, producing a 5-micron coat. A layer of hard chromium applied galvanically increases resistance to abrasive wear and prevents adhesion of the pressed powder to the pressing surface of the punch. In addition, it provides good corrosion protection.

CrN – CHROMIUM NITRIDE

CrN (grey) coating surpasses the commonly used chromium plating by allowing to:

- reduce susceptibility to adhesion
- keep excellent corrosion resistance
- maintain an extremely homogeneous coating structure
- achieve a very good price/quality ratio

PVD COATINGS

Coating metal surfaces in a vacuum process.

Benefits of PVD over galvanic coatings:

- higher edge stability
- maintaining contours
- better wear protection



TiN OR TiAlN (TITANIUM NITRIDE OR TITANIUM ALUMINIUM NITRIDE)

TiN or TiAlN (golden colour) coating has the following advantages:

- high level of wear protection
- smooth layer with low roughness
- very high hardness
- low thermal conductivity

DLC (DIAMOND LIKE CARBON)

The carbon-diamond coating (black colour) has the following advantages:

- high abrasion resistance
- long-lasting anti-adhesion properties
- use for very difficult products

In addition to the most common coatings described, a whole range of PVD coatings are used, which are modifications of them.





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FORMAT PARTS
FOR BLISTER
PACKAGING LINES



FORMAT PARTS FOR BLISTER PACKAGING LINES

To meet the needs of rapid implementation of customer projects, ADAMUS S.A. offers high-quality format parts for blister packaging machines of all types. Our well-equipped Design Office allows us to quickly draw up design documentation to ensure the correct operation of the blister formats produced. ADAMUS S.A.'s experience also includes the design and manufacture of components for cartoning lines. This makes it possible to implement projects involving the retooling of the entire packaging process cycle.

The feeding of tablets is a critical point that determines the speed and efficiency of the entire packaging cycle. Selecting and designing the right feeder plate is therefore one of the most important challenges for any supplier of blister formats.

For years, ADAMUS S.A. has specialised in the design and supply of dedicated feeder plates of various types. Our engineers work closely with customers at every stage of design, starting with determining the feasibility of feeding a particular type of tablets using

a specific type of feeder plate. Immediately after the manufacturing stage, before the tools are delivered to the customer, feeder plate tests are carried out using the actual tablets and the moulded film. The process of feeding tablets at different film travel speeds is investigated on a purpose-built test bench, determining the optimum parameters for this operation. On request, our engineers are also involved in the installation and commissioning of the format, helping to troubleshoot and resolve any problems.

PARTS FOR CAPSULING MACHINES

Long-standing experience in cooperating with the pharmaceutical industry puts us in a position to comprehensively support our customers in all areas of activity, not only in the manufacture of tablets, but also capsules.

Our engineers have extensive knowledge of spare and format parts for capsule packaging machines, allowing us to supply these components for most types of machines from global manufacturers.





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REPAIRS
AND SPARE PARTS



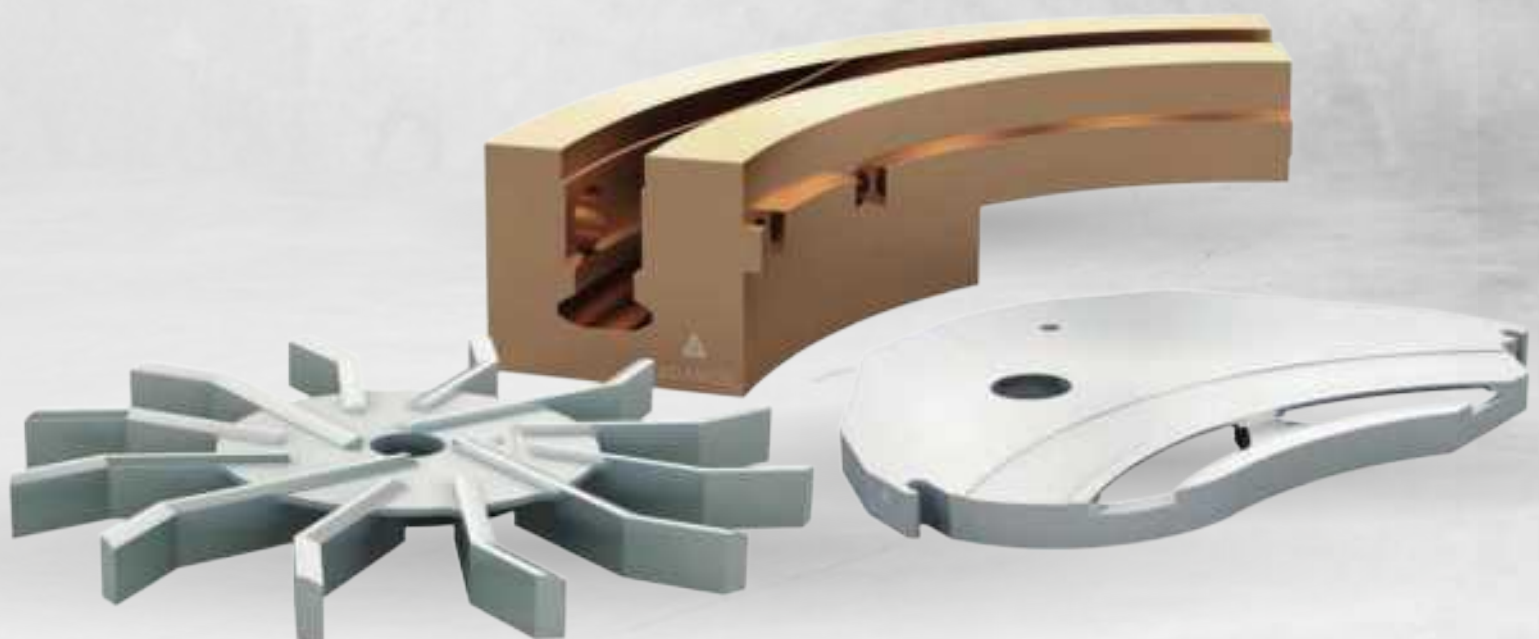
SPARE PARTS FOR TABLET PRESSES

Our well-established knowledge of the tablet formation process allows us to work together with customers to solve problems that may arise at various stages of the process.

A high-tech machine park adapted to the production of high-precision parts enables ADAMUS S.A. to expand its range of products to include spare parts for tablet presses. The high quality of the parts we offer, their reliability and highly competitive price allow our customers to achieve measurable savings without the risk of deterioration in the operation of their machines.

OUR SPARE PARTS PORTFOLIO INCLUDES:

- turrets
- plastic, bronze and steel cams
- pressure rollers
- feeder plates
- powder scrapers
- other mechanical components



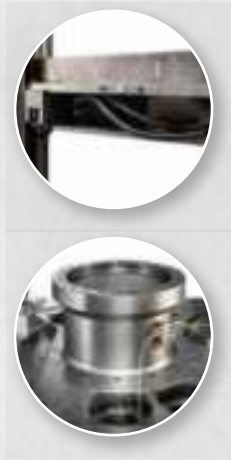




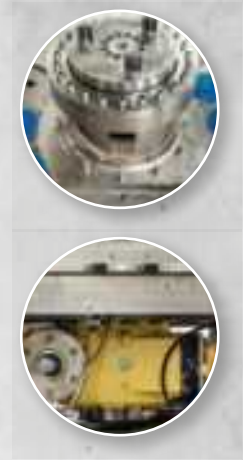
TURRET RECONDITIONING

At ADAMUS S.A., we place particular emphasis on services related to restoring the correct operation of tablet press turrets. Knowledge of the technical conditions for the interaction of all parts of the tablet press with the punches and dies ensures that the machines operate in accordance with the technical specifications of their manufacturers.





Stage I



Stage II

SERVICING AND REFURBISHMENTS

Our services include comprehensive diagnostics and a thorough evaluation of all components of your tablet press, including the most common wear and tear components, such as: cam surfaces, rotor seats and shaft dimensions, feeder plates or drive systems.

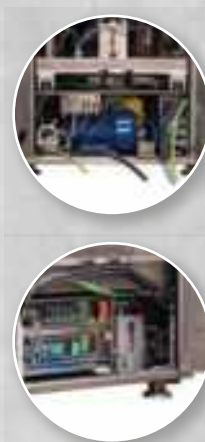
We carry out major overhauls of tablet presses including electrical and hydraulic systems and housings. We also supply new control systems on the customer's request.



Stage III



Stage IV



Stage V

REFURBISHMENT
OF TABLET PRESS

Duration: 5 months.





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MACHINES



TI-3 PUNCHES AND DIES MEASURING MACHINE

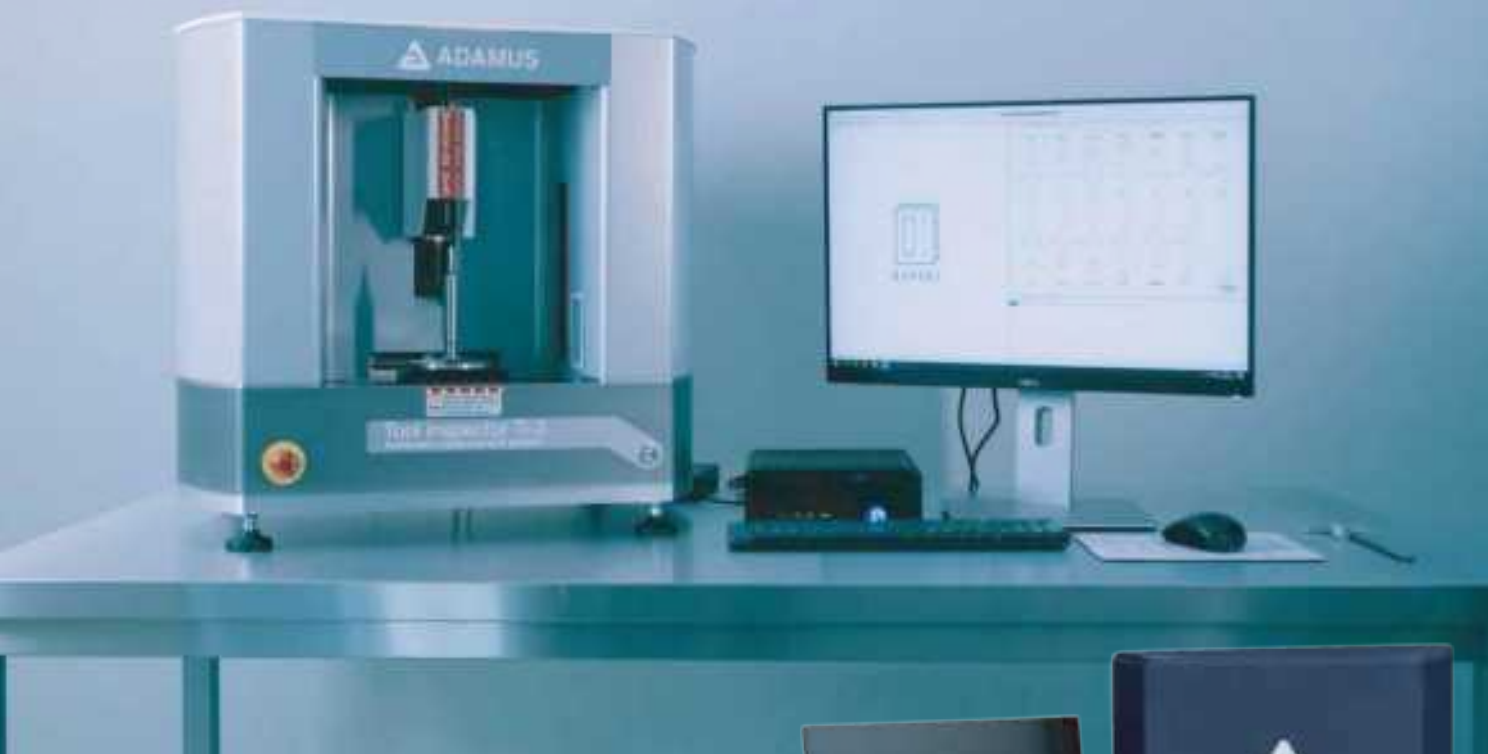
BASIC PARAMETERS OF THE TOOL INSPECTOR:

- fully automatic measurement, independent of tool complexity
- non-contact measurements with a resolution of 0.001 mm for punches
- contact measurements of wear with a resolution of 0.001 mm for punches
- autofocus camera with power-controlled illuminator (LED)
- dedicated on-board measuring machine controller with USB 2.0 communication interface

BASIC FEATURES OF SOFTWARE:

- open architecture application based on .NET Framework technology
- can be run on any computer with Windows 7 or 10
- easy and intuitive use of the programme
- automatic loading of the CAD file for the measured tools
- saving of records, their customisation, export to Excel or PDF files
- saving camera images to file
- punch pairing function
- multi-language application with the possibility of adding a new language
- camera view in maximum resolution with the possibility to control the position of the punch under the camera lens using a computer mouse
- open architecture enabling the capabilities of the measuring machine to be extended by installing new measurement libraries
- GUI adapted for user comfort





The machine is supplied with basic measuring libraries that allow automatic dimensioning of punches and single-tip dies of the following standards:

EURO-B, EURO-D, TSM-(IPT)-B, TSM-(IPT)-B2, TSM-(IPT)-D, FETTE EU1"-441, PHARMA, 20/28, 25/32, 25/32 SLOTTED, FS12:

- for punches – the basic library allows the following geometrical dimensions to be measured automatically:
overall height L0, working height L1, bowl depth (L0-L1), short axis A and long axis B of the shape (for shaped punches) or diameter D for round punches, shank diameter d1, d2
- for dies – the basic library allows the automatic measurement of the internal profile of the hole
- measurement libraries for special cases of single-tip and multi-tip punches and dies with a multiplicity of more than 2, are custom-made and delivered as a single installation file, extending the functionality of the measuring machine
- visual control of the workpiece quality
- measurement of engraving height



TECHNICAL DATA:

- supply voltage 110 V / 230 V; 50-60 Hz
- recommended operating temperature 20°C ± 0.5°C
- available language of the control system: Polish, English, German, Russian, Portuguese (Brazil), French, Spanish, Czech (other languages available on request)
- set of dedicated punch and die holders to make the work easier



NEW GENERATION OF PUNCH AND DIE POLISHING MACHINES

During the tablet manufacture process, the quality of the working surfaces of punches and dies gradually deteriorates as a result of natural wear and tear. This is mainly due to the physico-chemical and mechanical properties of the tablet products. Performing regular procedures to restore the smoothness of working surfaces and eliminate tarnish is therefore a must.

DRIVE COVER

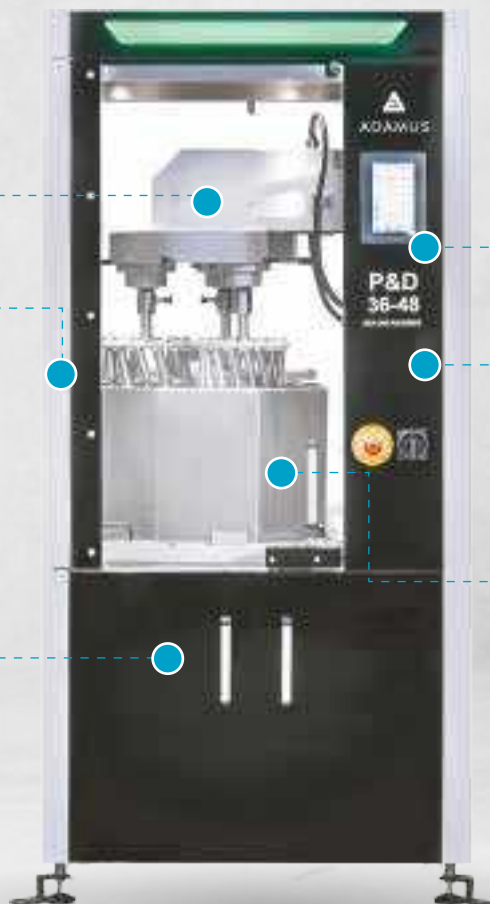
The stainless steel cover allows for easy cleaning of the polishing zone.

CONTROL CABINET

The machine has an integrated control cabinet within its frame. The entire wiring is laid in the side panel.

STORAGE SPACE

The lower part of the machine is provided for storing format holders and polishing stock.



CONTROL PANEL

7-inch colour touch screen. Intuitive menu.

CONTAINER CONTROL

A mechanical sensor controls the position and tightness of the granulate container.

PROCESS TANK

The machine is fitted with an octagonal container to enable optimal movement of the granulate during polishing process. A jacket-cooled version is available as an option.



TECHNICAL SPECIFICATIONS

Our polishing machines provide polishing in an automatic cycle from 16 to 80 punches of B format and from 12 to 60 punches of D format, depending on the number of holders.

The holders are designed to fit the entire upper or lower punch set for the most commonly used sizes of tablet presses. The machine is equipped with an advanced control system.

CONTROL SYSTEM PARAMETERS:

- colour touch screen in the control panel
- clear time indicators for polishing granulate replacement
- user-friendly menu with an intuitive system for entering operation parameters
- alert list notification system on the machine status

POLISHING MEDIA:

- dry walnut polishing granulate or plastic dry granulate
- polishing paste
- granulate impregnation oil

MODELS OF P&D SERIES AUTOMATIC POLISHING MACHINES:

- 12 – 16 P & D (for one holder)
- 36 – 48 P & D (for three holders)
- 60 – 80 P & D (for five holders)



DIGITAL CAMERA FOR VIDEO SURVEILLANCE

A digital camera with outstanding optical performance and the state-of-the-art 5 MP sensor are the best technological solution for the professional and highly demanding pharmaceutical environment.

SPECIFICATIONS:

- die 5 MP (EDGE)
- image magnification up to x220
- Extended Depth of Field (EDOF) – the function automatically sharpens several levels of the image to improve the visibility of details of three-dimensional objects such as tablets or multi-level surfaces of punch tips
- Extended Dynamic Range (EDR) function – darker details or brighter areas in the object are folded and imaged from different exposure levels
- Automatic Magnified Reading (AMR) function – an integrated function for easier and faster measurements
- adjustable polarisation – this camera model is ideal for working with reflective or very bright objects, such as the working tips of punches
- aluminium housing
- extended measuring functions
- calibration function
- interchangeable optical caps
- stepless adjustment of illumination LED-(FLC)
- dedicated software with a wide range of measurement and image processing options



SINGLE-STATION TABLET PRESS

The single-station tablet press is a perfect solution for low-volume tablet production or for laboratory purposes, where a small number of tablets are required without excessive consumption of granulate in a high-volume production environment for testing purposes.

ADVANTAGES:

- transparent covers for safety purposes
- lever for pushing out tablets
- housing and components in steel
- digital display showing:
 - pressing force
 - pushing force
- hydraulic pressure indicator
- easy cleaning of the machine after tablet formation
- monitoring of tablet formulation parameters
- easy access to the tablet formulation chamber
- easy transport

TECHNICAL DATA:

- maximum pressing force: up to 100 kN
- maximum feeder plate depth: 20 mm
- maximum tablet size: 25 mm
- supports “EU B” and „EU D” standards
- digital controller for pressing pressure and upper punch return for tablet ejection
- power supply 230 V, 50 Hz / 110 V, 60 Hz
- dimensions [mm] 650x700x1660 (incl. the bench)
- available with dedicated bench



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MAINTENANCE
OF TOOLS



TOOL STORAGE

In order to respond to our customers' demands for solutions to optimise tool storage, we supply tool cabinets to maximise storage space capacity.

The cabinets are equipped with 9 or 15 drawers and come in 3 different lengths. The drawers contain between 2 and 8 trays, depending on the configuration. Bearing in mind the expectations of our partners, along with the standard equipment of the cabinets, we can design new types of trays according to individual customer needs.

TSS cabinets are ideal for storing spare parts such as segments or cams and other tools used in the production department. To ensure the safety of the stored parts, our engineers are here to design dedicated organisers.

As the manufacturer of the cabinets, Adamus S.A. can adapt them to the needs of the customer and their storage management. The cabinets can be customised with regard to the following:

- number of organisers
- number of drawers
- size of drawers
- types of organisers (for punching tools/spare parts)
- mobility (by means of a tooling trolley)
- other customer-specific modifications. The TSS Cabinet provides excellent protection for stored punching tools and spare parts while ensuring safe use.



CHARACTERISTICS:

- stainless steel housing (standard option)
- configuration of trays adapted to different types of punches and dies
- reinforced slides with anti-tilt system (standard option)
- locking of drawers/cabinets (standard option)
- foos/wheels (standard option)
- pallet truck reinforcement (optional)

STANDARD CABINET SERIES:

- series SSA9A (9 drawers)
- series SSA9B (9 drawers)
- series SSA9C (9 drawers)
- series SSA15A (15 drawers)
- series SSA15B (15 drawers)
- series SSA15C (15 drawers)



MORE **THAN** STORAGE.



ULTRASONIC CLEANERS

By using an ultrasonic cleaner, better cleaning results can be achieved in a shorter period of time than with traditional methods. Ultrasonic cleaning derives its effectiveness from the intense cavitation effects, which do not damage the surfaces being cleaned.

We offer units in three different sizes, equipped with special punch and die holders. Along with the machinery, we provide suitable high-performance cleaning agents that effectively support the removal of contaminants, contain rust inhibitor properties and guarantee the desired results.

SPECIFICATIONS:

- intuitive symbols on the control panel and easily traceable parameters
- LED display showing both the expected and the actual values
- bath heating from 20 to 80°C, adjustable by thermostat with LED display
- set and real temperature values
- visual signalling when the temperature is exceeded
- timer counting down the time of operation, DEGAS(S) function – enabling the water used for bathing to be degassed in order to increase the cleaning effect of cavitation, automatic switch-off after 12 hours from the last time the button was pressed
- indication of safety dosage limit
- one-piece drip tray
- PZT – high-performance transducers

PRODUCTS IN GROUP:

- ultrasonic cleaner USC-18a (container capacity of 18.7 l)
- ultrasonic cleaner USC-28a (container capacity of 28 l)
- ultrasonic cleaner USC-45a (container capacity of 45 l)



MAINTENANCE OF TOOLS

PROTECTIVE, CLEANING AND POLISHING AGENTS

We pay a great deal of attention to the maintenance of the tools we manufacture, ensuring the highest quality solutions for cleaning, polishing and protection.

We offer a wide range of high-performance, easy-to-use, fully synthetic anti-corrosion formulations to protect steel components used in the food and pharmaceutical industries, based on the formation of a thin, high-performance film that protects machine components.

The fluid is a cleaning agent that evaporates quickly without leaving any residue. It is a highly effective blend of active ingredients with a cleaning and degreasing effect. The product has the following certifications: NSF, Kosher and Halal.



PLASTIC GRANULATE FOR MACHINE POLISHING:

In response to customer expectations, alongside the walnut shell preparation we offer plastic granulate with similar properties. This is an ideal solution when inorganic formulations need to be used:

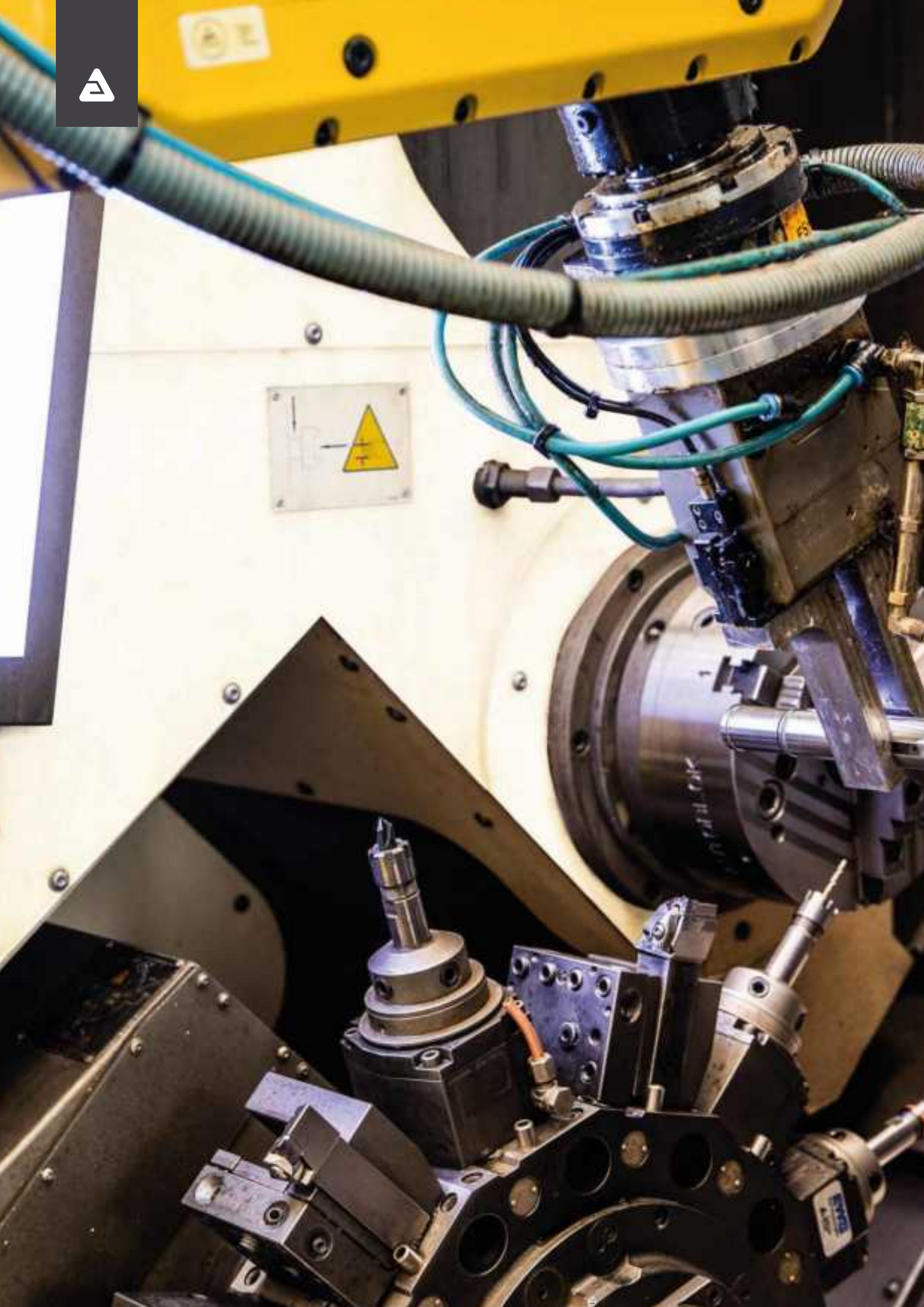
- urea resin with a maximum hardness of 3.5 (MOH'S scale)
- melamine resin with a maximum hardness of 4.0 (MOH'S scale)

TYPES OF GRANULATES OFFERED:

- | | |
|---------------------|-----------------------|
| — 40/60: 250–420 µm | — 16/20: 850–1200 µm |
| — 30/40: 420–600 µm | — 12/20: 850–1700 µm |
| — 20/30: 600–850 µm | — 12/16: 1200–1700 µm |

Our recommendation – type 40/60, polishing effect with the **highest** smoothness.









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