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RITM

FROM EDITORS

Dear friends!

We are glad to welcome all the participants and guests of METAV-2008 exhibition, the largest world forum for metal-working industry. Please take a look here at the English version of RITM magazine.

For almost 6 years, our magazine has been providing the up-to-date information to Russian machine-tool building industry. It is well known and widely used by specialists of those engineering plants interested in production line modernization. The purpose of this special issue is to make new contacts not only in Germany but in other countries producing metal-working tools, as well.

Russian market of industrial equipment grows and becomes more and more appealing to foreign manufacturers. If you would like to make yourself known in Russia, we are here to help you. Free distribution of the magazine to numerous companies of our country makes every issue hit the desk of a top manager or major specialist, and our participation in all leading exhibitions on the subject is a 100% guarantee that your offer will be seen, analyzed and accepted. Our partners confirm getting steady returns from their publications in RITM magazine.

Nice to meet you and welcome!

Best regards,
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ritm@gardesmash.com
(495) 755-94-37

ALL from the same place

COMPLEX APPROACH

Modern requirements to metal processing arrangements assume first of all a complex approach to tasks solving. It is vital not only to select and purchase equipment but also clearly imagine the whole production cycle including designing, technological preparation, tools selection, staff selection and training and equipment maintenance periods. High-precision parts producers need both metal processing machine tools providing absolute precision, reliability and durability and solutions making the enterprise competitive on Russian and international markets. Successful completion of the whole complex task largely depends on partners choice.

«StankoMashKomplect» (SMK) Company operating on the metal processing equipment market over 10 years represents in Russia Swiss company Schaublin Machines SA and supplies equipment of such well-known European brands as:

Schaublin Machines SA – high-precision small and medium lathes and machining centers

Liechti - 5-6-axis high-speed machining centers with up to 6 spindles

Almac – milling machines, machining centers for small and micro-parts, blades machining. High-speed machining. Work with 3-4 or 5 axis.

ESCO – new generation automatic lathes. Possibility of machining simple and complicated parts between 0.2 - 12 mm (loading - bar, coil); high-speed and economical high-precision machining parts up to 5 mm diameter in large or medium loading lots.

Wyssbrod Technologie – mechanical machining centers with up to 6 spindles.

LNS – bar feeding devices.

CombiTec – high-precision machine-tools for internal and outside grinding. Universal internal grinding, rough and finishing high-speed grinding of hard-alloy parts, radius grinding.

Estarta – centerless grinding machines.

Kocher – 5-axis grinding and sharpening machines

Lodi – profile- and plane grinding machines with vertical head and horizontal round table.

AbaZ&B – profile- and plane grinding machines with NC or dial-in control for making tools and die molds and other production.

Gioria S.P.A. – grinding machines for internal, outside and end grinding.

Monnier + Zahner Ltd – gear-grinding, worm-milling and threading machines.

LambertWahli – worm an thread milling machines.

"StankoMashKomplect" Company carries out complex activity on equipment and extra options selection for maximum customer needs satisfaction, productivity increasing and payback period shortening.

Indeed, if a customer buys "bare" machine-tool, it takes at least half a year before it would be equipped with modern cutting and auxiliary tools, setting and fitting devices, and technology and controlling program will be developed. A tendency of some customers to "stuff" a machine tool with items at hand often leads to inefficient solutions. As a result a powerful and efficient machine works far below its possible level giving no productivity growth and often threatening equipment operability as a whole. The only itself suggesting summary is: new equipment introduction must be complex, i.e. supported with modern tools, progressive technology, available staff training with further consulting and full service, and all mentioned must come to a customer simultaneously from one supplier.

An integral part of "StankoMashKomplect" Company structure is technical and service division providing successful fulfillment of main tasks. The department structure is continuously refined and expanded on tha base of many years of experience. Today a team of highly-skilled service engineers and experts in electronics performs the following tasks:

- installation and commissioning
- diagnostics and repair during and after warranty period
- prophylactic revision of equipment in operation
- customer's service staff training
- competitive test works according to customers' requirement specifications
- consulting on equipment operation and service questions.

Range of equipment serviced by this department includes examples from virtually each direction of metal machining.

Customers may be sure that they will

not only acquire equipment but also could be able the most acute and complicated problem — with direct participation of service experts they would train own experts able to fulfill any technological tasks on production using purchased equipment. Staff is trained both at customer's production facility and on the equipment in training and demonstration center in Saratov. During training staff can get not only necessary theoretical knowledge but also practical skills on operation and maintenance. The service department also pays great attention to traditional and the most complicated problem – equipment operability keeping. The priority of this work is responsiveness in solving customers' problems in equipment operation. Service experts consult customer's experts on possible problems as soon as possible using all modern communications and may come to customer if necessary.

Keeping the attitude that low product quality, high price and in the most degree bad service make customers go away to rivals, service employees continuously improve their qualification by training at companies – equipment manufacturers (Switzerland, Germany) on new equipment samples and refining their knowledge of equipment already present at the market.

To solve these tasks "SMK" company have production and warehousing facilities, service, demonstration and training center and of course highly-skilled experts in machine building.

In financial settlements sphere we offer various solutions for equipment pay-off including leasing schemes.

Basing on experience of many industry branches single-part and serial production make "StankoMashKomplect" company a reliable and edvanced partner. Supplying both single machines and complex production lines we always try to give our customers the best technological and economical solution. A complex production program together with possibility of knowledge and experience use is supplied from the same place.

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DIAMOND LIKE COATING (DLC) ON RUSSIAN MARKET

«Special technologies» limited liability company was established on the base of Ural division of Russian Academy of Sciences (Yekaterinburg) and a research center of a large enterprise specializing in polymer production, in active cooperation with a few former defense industry enterprises. The initial planned aim of the enterprise was manufacturing application of the best developments from Russian scientists. The enterprise was headed by Vitaly S. Belyayev, Doctor of chemistry, who came from academic sphere (Ural division of Russian Academy of Sciences, Yekaterinburg). He and his colleagues from the Academy of Sciences had worked for a long time in foreign venture companies (Japanese ITAC Ltd., SHINKO-PANTEC, NAGATA-SEIKI, South-Korean SAMSUNG HEAVY INDUSTRY, SAMSUNG ELECTRONICS) that tried to introduce the most prospective scientific developments in their countries. All these companies draw the vast majority of their developments from Russia.

In particular, there were employees of «Special technologies» LLC who previously introduced into SAMSUNG video tape recorders from SAMSUNG ELECTRONICS a new technique of video-heads diamond-like coating known in Russia as Diamond Head technology. In the further 5 years the same people refined this technique and introduced it in Japanese companies like ITAC Ltd. и NAGATA-SEIKI (Niigata province). The working experience from this companies gave us a strong conviction that Russia is a country with a highest intellectual potential that must be demanded firstly home and then possibly and abroad in the form of production export.

Starting from 2002 «Special technologies» LLC with great efforts puts across the real market of Russian Federation introducing truly new and advanced technologies. This is undoubtly difficult task, therefore during the first three years we struggled for survival and relied on support from one of the institutions from Academy of Sciences basing in its premises. Only after four years of promotion our products on the market we obtained own capital. Thanks to that we could obtain and draw own production and office premises where the equipment for diamond like coating application not worse than those supplied in Japan.

The technique of diamond-like coating (DLC) application comes to graphite plasmatic atomization in a vacuum chamber and carbon ions deposition on products, e.g., on metal processing tools, with high energy. As a result of this carbon sputtering an amorphous coating is formed consisting from carbon atoms with both diamond and graphite-like bonds. These amorphous coatings in a wide range of temperatures up to the room temperature and on various materials: metals, ceramic, glass and plastics.

High content of carbon atoms with diamond-like bonds together with graphite-like bonds creates unique DLC features, such as:

- high hardness comparable with pure diamond;
- low friction factor typical for graphite;
- high wear resistance;
- chemical passivity;
- biological compatibility with vivid tissues;
- environmental friendliness.

A process of such coatings sputtering by its essence lies in the nano-technological area since coating depth varies from angstroms and nanometers to a few microns. The developed complex coating of a few nano-meters depth with a pure DLC upper layer proved able to withstand giant mechanical loads during operation. It is this that allowed us to solve the most difficult problem typical for diamond-like coatings, - a problem of good adhesion of high-strength coating to any surfaces, including high-alloy metals typical for tool steels. So, diamond-like coating applied on a metal processing tool can increase its service life between 2 and 20 times depending on the processed material kind.

This coating proved to be especially efficient if applied on tools for ductile metals processing such as copper, aluminum and their alloys. Everyone who had to drill small holes in a pure aluminum or copper knows how difficult it is. Binding metal sticking in bore grooves and literally does not allow drilling a hole in it.

DLC DIAMOND LIKE COATING™

A drill bit either rotates on a same place or, that's even worse, breaks, and a piece of drill remains in a metal and it is practically impossible to remove it. As a result either new neighboring hole is to be drilled or a product has to be utilized and works to be started from the beginning. The metal processing industry tries to correct this situation by using special bores of variable diameter and special lubricating and cooling liquids. But even in this case processing non-ferrous metals with high ductility remains among the most complicated operations. Using tools with diamond-like coating thanks to its slipperiness comparable to graphite and high strength comparable to diamond metal doesn't stick in tool bores even without lubricating and cooling liquid. As a result tools serve tens times more

and do not make problems for technologists. We were convinced of it during real tests at various enterprises both in Japan and Russia, at defense branch enterprises. For instance, MITSUBISHI CARBIDE company began to sell widely its metal-cutting tools with DLC spraying it on products from above-mentioned NAGATA-SEIKI company using Russian technology.

At present we are ready to industrial scale sputtering of diamond-like coatings. We are also ready to make trial free sputtering of first samples for interested enterprises.

We are located in Yekaterinburg,
our phones **+7 (343) 345-27-27**
345-27-25, 345-27-28

Fax: +7 (343) 345-27-26,
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isol@isollat.ru

Our web-sites: **www.dlc.ru**
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CAD/CAM SYSTEMS
IN AUTOMATED PRODUCTION

Modern production uses computer technologies for automation at each level. It is based on networked CAD/CAM, CAE systems.

CAD (COMPUTER AIDED DESIGN) SYSTEM – computer aided design, CAM system – computer aided manufacturing and CAE system - Computer Aided Engineering – calculation, supervision and control system. Production using CAD/CAM, CAE systems is determined as computer-integrated production (CIP).

Generally the following systems and programs are used in addition to CAD/CAM, CAEsystems.

PDM (PRODUCT DATA MANAGEMENT) – automated system for project data and production information management.

ERP (ENTERPRISE RESOURCE PLANNING SYSTEM) – a set of integrated applications allowing creation of united environment for automated planning, accounting, control and analysis of all main business operations: production, finances, procurement, sales, warehousing, maintenance etc.

SSM (SALES AND SERVICES MANAGEMENT).

CRM (CUSTOMER RELATIONSHIP MANAGEMENT) – systems to organize relations with customers, between sellers and buyers.

SRM (SUPPLIER RELATIONSHIP MANAGEMENT).

SCM (SUPPLY CHAIN MANAGEMENT) – system for supply chains management, joins and coordinates modules related to demand determination, customers relations, sales, production, procurement, internal and external transportation. Functionalities are joined by using total through planning system, APS equivalent algorithms are often used.

DRM (DISTRIBUTION REQUIREMENTS MANAGEMENT) – sales management system based on sales system requirements.

B2B (BUSINESS TO BUSINESS) – electronic means of businesses integration in the "manufacturer – customer" chain. The simplest version of B2B is electronic orders placement system.

B2C (BUSINESS TO CONSUMER) – electronic means of supplier and customer integration. Consumers can not only place electronic orders but supervise their execution via suppliers' electronic systems and Internet.

E-COMMERCE (ELECTRONIC TRADE) – orders placement and payment via Internet.

MRP-II (MANUFACTURING REQUIREMENTS PLANNING) – a program for calculation of production needs in resources and facilities to produce the planned output volumes and planning orders fulfillment terms and equipment workload at the working centers level.

APS (ADVANCED PLANNING AND SCHEDULING) – a system for enhanced scheduling and production planning optimization, more precisely - for making optimal production plans and schedules considering existing "bottlenecks".

MES (MANUFACTURING EXECUTION SYSTEM) – manufacturing execution systems which formulate unit-level equipment workload according to the schedules made and orders available; may include APS.

BSC (BALANCED SCORE CARDS) – interrelated business functioning indicators are formed on the base of information available in the system according to the same-named management concept requirements.

OLAP (ON-LINE ANALYTICAL PROCESSING) – systems for multivariate real-time data analysis. Provide powerful analysis tool.

TQM (TOTAL QUALITY MANAGEMENT) – helps to organize enterprise work within the same-named management concept.

For successful enterprise functioning these systems and programs are supplied with informational links via united integral system usually determined as **PRODUCT LIFECYCLE MANAGEMENT (PLM)**.

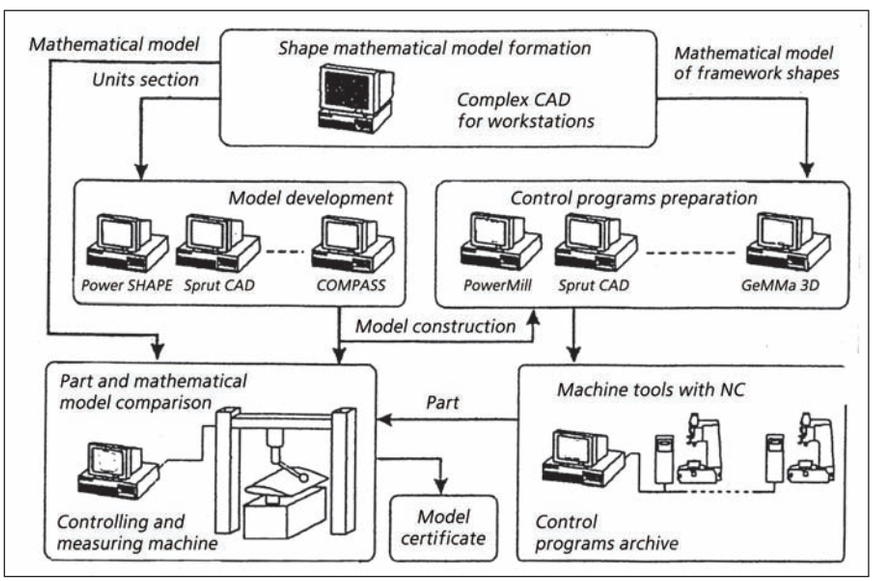
It is possible [1] to consider **PLM** as a solution joining separate automation areas in a unified automation space and realizing through designing, technological and trade cycle from design preparation to recycling.

In Russia CAD/CAM, CAE systems are determined as SAPR/ASTPP systems and production control systems - ASUP. CAD/CAM, CAE system use allows an enterprise to avoid costly try-and-error method and easily move from new products preparation to serial production.

CAD/CAM, CAE program products, including integrated solutions, are represented by numerous companies. For solving the most typical tasks of designing and technological practices the following systems versions [1, 2, 3, 4, 5 and others] are used.

ELECTRONIC OBJECT MODEL

An electronic object model due to CAD/CAM, CAE systems development has



become main component in virtually all program systems and subsystems providing automated CIP execution.

Electronic models (let's call them CAD-models) are main objects in designing information systems (designing object, import-export object between CAD/CAM systems, a base for classification, identification and coding, for photo-realistic images acquisition, for creation graphic information libraries, standard technical documentation, archives etc.).

CAD-models are main objects in virtually each modern technological CAD operation. They allow new technological processes generation, a technological analogues search, controlling procedures development and generation for various automated processing, controlling and measuring equipment.

CAD-models are the base of all computer system for technological rig designing: jigs, cutting and measuring tools. Even databases for modern marketing, sales and production accounting services can be based on CAD-models. Their use allows: change substantially nature of works for a number of specialists, improve their opportunities for duties fulfillment and production quality and shorten duration of a lot of operations.

Thus, complete 3D electronic product representation may serve as a base for a complete product development, production and sale, i.e. PRODUCT LIFE CYCLE. According to ISO 9004 standard a product life cycle includes the following stages:

1. Marketing, market search and study.
2. Design and engineering.
3. Procurement.
4. Production technological preparation.
5. Production, control and testing.
6. Packaging and storage.
7. Sale and/or distribution.
8. Commissioning and operation.
9. Maintenance and service.
10. Recycling.

Engineering activity includes stages 2, 4, 5, 8 and 9. Stages 1, 3, 6, 7 and 10 determine engineering business and management. Production technological preparation includes stages 2, 3 and 4. Product packaging and storage are usually included into production process.

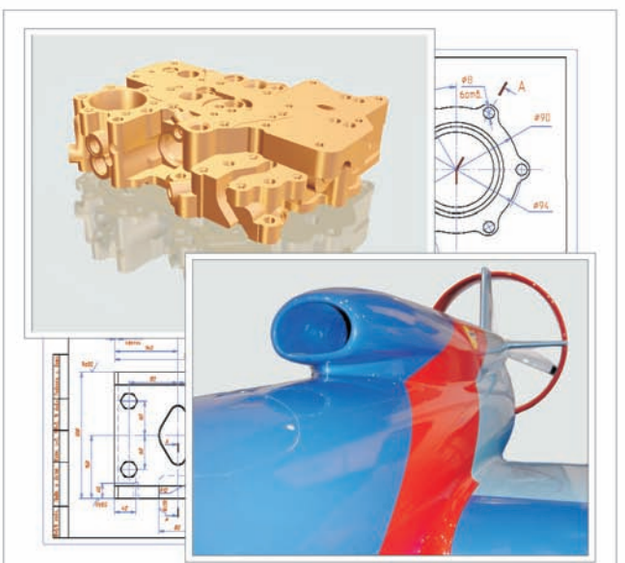
Each working stage within a Product Life Cycle has its own specifics. Automation of these works requires corresponding hardware and software together determined as automation systems. These systems are divided onto two groups: computer aided design (CAD) systems and automatic control systems (ACS). The latter include enterprise, production, technological processes and quality ACS.

CAD/CAM, CAE SYSTEMS

CAD/CAM, CAE software products include separate interrelated software modules for solving various tasks set by production. Users may buy these modules both as a whole and individually. This allows creation of a certain software configuration of united enterprise computer network and its hardware in terms of requirements and possibilities. In the simplest case three levels of production tasks solving in case of CIP: development of production object mathematical model preparation of control programs for developed objects production, their production and control (see fig. 1). Each level has its own corresponding software systems.

In a common case at supply all CAD/CAM, CAE systems are determined as software in addition to the corresponding computer equipment complex.

AD/CAM, CAE systems are classified into three levels: lower, medium and upper level systems. Lower level systems are intended for: automated designing and technological documentation issuing; preparation of controlling programs for 2 and 5-axis equipment with numeric control "by electronic drawing"; documents issuing terms shortening. Lower level systems allow shortening projects development but do not secure developers from mistakes even if documents strictly comply to unified systems of designing and technological documentation; economic efficiency depends on designer's or technologist's skills and wage and their experience in using CAD.



A BRIEF REVIEW OF SOME CAD/CAM SYSTEMS

Company, country, web-site	Software product
Autodesk (USA) *www.autodesk.ru http://usa.autodesk.com*	A family of CAD/CAM software products based on the AutoCAD
Dassault Systemes (France, USA) *www.catia.ibm.com www.ibm.ru/*	**CATIA/CADAM Solutions** system is an upper level **CAD/CAM/CAE** system (with **ACIS** core), promoted by **IBM**
Siemens PLM Software as a department of **Siemens A&D** (formerly UGS company) (Germany - USA) *www.ugs.ru*	**Teamcenter, NX, Solid Edge, Tecnomatix, UGS Velocity Series and PLM Components** and other systems
Parametric Technology Corporation (USA) *www.ptc.com*	Offers a number of systems on the global market. The **Pro/ENGENEER** is a complex upper level system providing complicated structures development
SolidWorks Co. (USA) *www.solidworks.ru www.solidworks.com*	**SolidWorks** is a parametric system of medium level for 3D designing and modeling
Cimatron Ltd. (Israel) *www.cimatron.com www.bee-pitron.ru*	Integrated **CAD/CAM** systems
Surfware Ink. (USA) *www.surfware.ru, www.surfware.com*	PC-oriented **CAD/CAM** system **SURFCAM** is a system for computer-aided designing and production preparation, used for 2D and 3D designing
Delcam plc (Great Britain) *www.delcam.ru www.delcam.com*	CAD of designing and technological purpose for modeling, making and control of complicated products and technological rig
ASCON (Russia) *www.ascon.ru*	Computer-aided design system **COMPASS** including a number of software modules
JSC «Top Systems» (Russia) *www.tflex.ru*	Software complex **T-FLEX CAD/CAM/CAE/PDM** comprising a system package for design automation and computer-aided production preparation
«Pro Pro Group» (Russia) *www.propro.ru*	**bCAD** – a software package for development of new techologies, 3D-graphics and CAD, programs for 2D sketching and exact drawing, 3D modeling and photorealistic rendering, 3D modeling and visualization for a PC
INTERMECH (Byelorussia) *www.intermech.ru*	Authorized developer and system center for **Autodesk** company and **Research Associate** for **SolidWorks** company – dedicated to CAD development for machine building and instrument making
JSC «NTTs GeMMa» (Russia) *www.gemma.ru*	A system for geometric modeling and processing programming for machine tools with NC. **GeMMa-3D** allows creating programs for the most complicated parts machining by milling, drilling, electric erosion cutting, chipping, turning and engraving
Consistent Software (Russia) *www.csoft.ru*	Modern hi-tech software for all fields of designing: machine building, architecture, construction etc
ADEM Group of companies (Russia) *www.adem.ru*	An integrated **CAD/CAM/CAPP** system **ADEM** for automation of designing and technological production preparation. A unified software complex includes modules for solid and plane modeling; design and technological documents issuing; technological processes designing; programming machine-tools with NC (lathes, milling, spark eroders, laser and others); archives and projects management. Also includes means of accumulated knowledge renovation (paper drawings, punched tapes), projects manufacturability analysis and standardization
JSC «Sprut-Technology» (Russia) *www.sprut.ru*	**CAD/CAM/CAE** program consisting of several software modules merged into united complex. **Sprut-CAD** is an open designing environment, **SprutTP** – a system for automated technological processes designing, **SprutCAM** – a system for developing controlling programs for machine tools with NC, SprutNCTuner is a system of control and final debugging of controlling programs for milling machines with NC
Yakovlev named united design bureau (Russia) *www.sdr.ru*	**CAD «Sudarushka»**: software for drawings issuing, spatial modeling, complicated shape surfaces determination, a system of preparation controlling programs for milling machines with NC, for sheet stamping and notching, for printed boards edging, for making strength calculations by finite elements method, aerodynamic calculations etc.
Scientific and technical center APM (Russia) *www.apm.ru*	A system for automated calculation and designing machines, gearings and structures – automated workplace **WinMachine**. Includes a number of program modules..

Medium levels systems are intended for: product solid model development to control parts mutual positions; determination of mass-inertia, strength and other properties; modeling of NC-processing of all kinds; exterior processing by photorealistic views; issuing designing and technological documents; projects management on the base of electronic documents circulation. Medium level systems allow shortening projects development terms. The economic effect is in multiple decrease of costs for debugging of trial production designs due to excluding design mistakes.

Upper level systems, on addition to the above-listed functions of lover and medium level systems, allow: designing parts with manufacturability; designing parts considering features of materials (plastics, metal sheet etc.); gears operation modeling; dynamic analysis of assembly with assembly rig and tools simulation; designing rig with manufacturing processes (stamping, casting, bending) modeling, excluding thus defects in rig and making full-sized models. Upper level systems allow considerable shortening of production development terms (30-50%); economic efficiency is in multiple shortening of costs for production preparation (50-3000%).

It should be noted that systems division into levels is rather conventional since there is a trend of approaching medium level systems (by various parameters) to upper level systems, and lower level systems more often cease to be just 2D drawing oriented but become 3D systems.

Domestic users also know many other CAD/CAM, CAE systems. All these systems solve their peculiar tasks on design automation and production preparation including technological tasks.

P.P. Serebrenitsky

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- Help you participate in Russian exhibitions
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  the leading Russian periodical on metal-working
- Give you our well established and efficient delivery service
- Provide warranty service and maintenance

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MARKATOR®

MARKATOR group of companies was starting its production from universal marking devices. Today production under the MARKATOR trade mark high-tech equipment for making inscriptions and logos by various ways and impact method on any surfaces (from polyurethane to steel with HRC 63…65).
The main idea of the company is a creation of mobile, simple and reliable equipment..

Flymaker – hand-held mountable marking machine with 8 stationary

The principle of the equipment work:

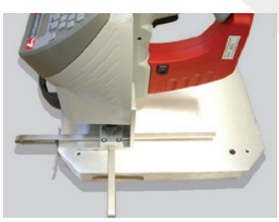
An operator prints text to be engraved, checks it on the LCD display, selects it and – it's all!
Operator's instruction takes only 1 minute since control panel is logical and simple.

- An ideal equipment for fast, flexible, strong and merely noiseless of all hard materials including hardened steel
- The machine can be rusified per customer's wish
- Both for serial and one-shot marking
- No cables and hoses
- Built-in keyboard, display and accumulator
- Operator's instruction without computer numerical control knowledge: 1 minute
- Very long texts are selected automatically, - it's the first thinking marking machine!
- Selects clearly structured dot numbers, letters, symbols and logos by means of dot matrix.

Specifications:
- Font levels (adjustable): between 2.0 and 9.9 mm, selectable 1/10 steps;
- Special functions – marking of current numbers: serial numbers up or down;
- Real time and date, logo; selection speed – up to 3 symbols per second;
- Selection range – 75x25 mm;
- Selection position (adjustable) – right, left, center and area borders;
- Font (automatic width adjustment) – an average font accepted in Germany in the 1451 format in a dot matrix of 5x7 and 9x13 format;
- Selection depth (adjustable) – up to 0.3 mm depending on material, constant;
- Selectable material – aluminum, plastics, hardened steel (about 62 HRC);
- Allowable leveling height – up to 5 mm (at constant leveling depth);
- Marking needle drive – electromagnetic (noiseless);
- Linkage – RS232, bar code reading device, serial text input is possible;
- Area for column support installation – about 200x300 mm.

1. Reliable, compact, powerful and inexpensive marking device.
2. Good software compatibility.
3. Integrated control. Place for controlling computer and gear is not necessary.
4. Selects up to 5 symbols per second.

Wide action range:
- serial connection
- logo marking
- S100 software for PC
- typical factory settings
- high marking quality



Easily mounted, e.g., into distribution cabinet, mounting panel or directly into production equipment.

While producing hi-tech equipment the MARKATOR company does not forget about traditional ways of marking.

For more information and detailed catalogue of our equipment please call (495) 231-78-71; 956-68-00; 737-76-52
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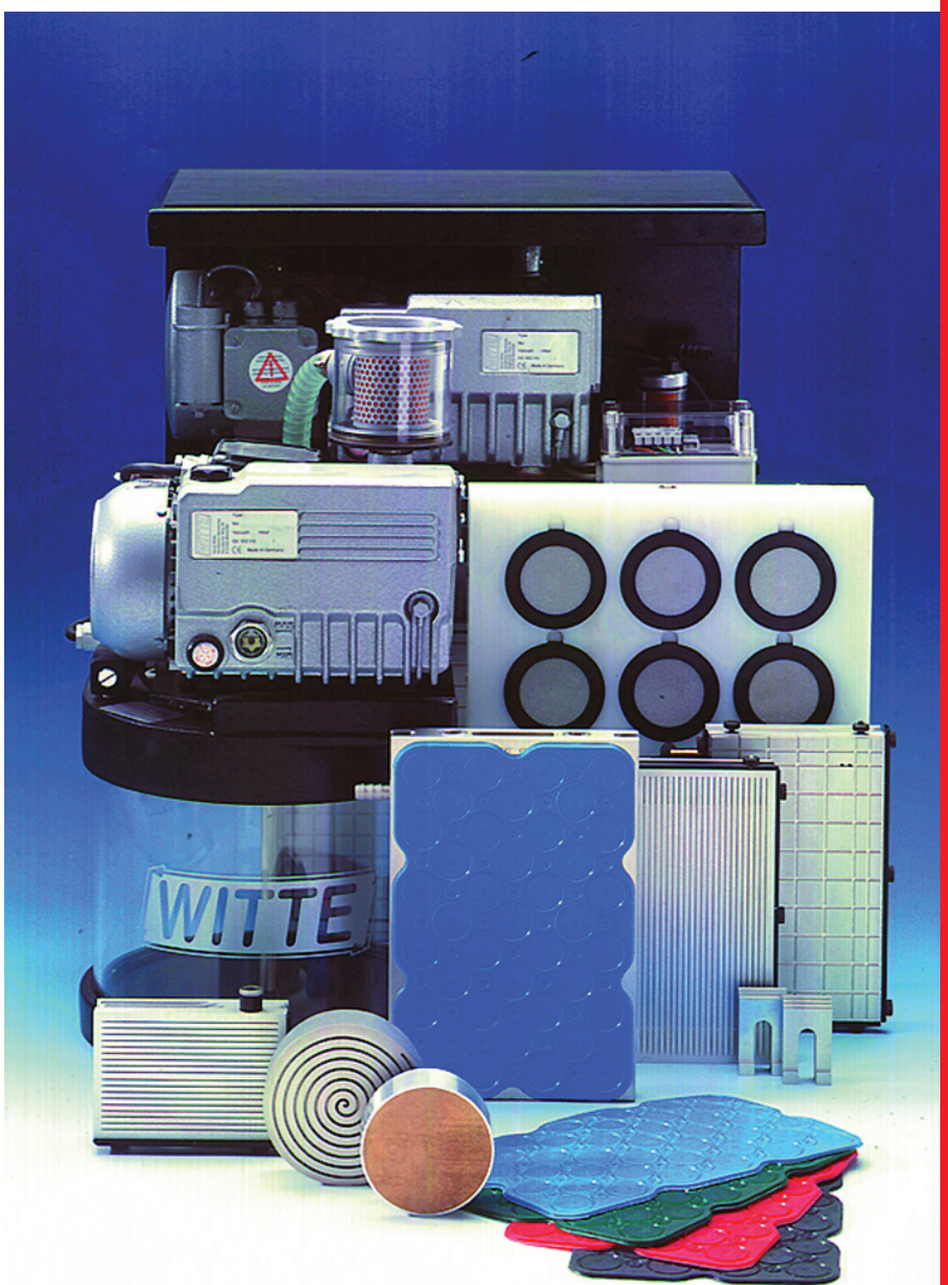
Vacuum fixing systems and parts fixing technology!

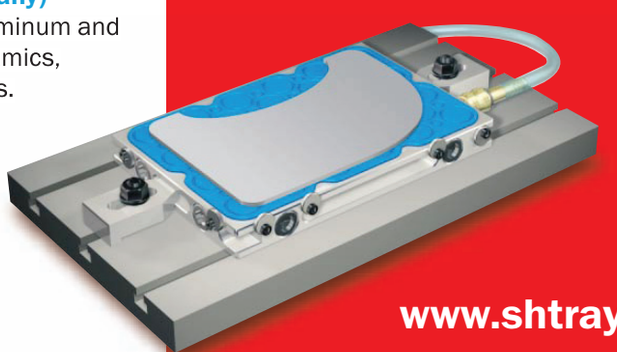


► Shorten part manufacturing duration and exclude thin sheet feed stocks flexure

► Allow using only one fixing operation for 5-side mechanical processing

► Make various technological processing cycles (milling, grinding, turning processing, engraving, sparking, checking and measurements, cladding, drilling, reaming and chamfering at certain conditions)

Vacuum clamping bed plates from WITTE Company (Germany)
– a simple solution for clamping non-magnetic materials (aluminum and other non-ferrous metals, graphite, plastics, glass, wood, ceramics, titanium, steel and others) providing technological advantages.



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RISE IN QUALITY= GROWTH SALES VOLUME

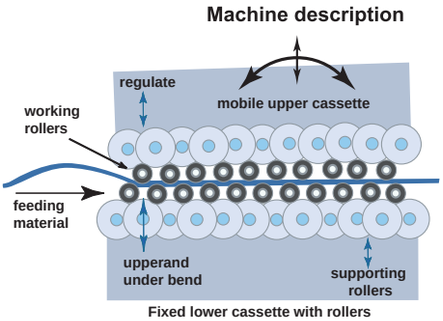
Sheet metal items production takes special place in Russia – it's the most capacious and very profitable market in metal processing with volumes growing from year to year. However demand at this market is close to saturation and customers boost quality demands. Therefore commodity producers refine their technological processes borrowing at that in fact western colleagues' experience.

Today it's impossible to be competitive in sheet processing without using in production modern precision highly-efficient imported equipment of direct purpose, i.e. designed for cutout and bending sheet materials (Trumpf, Amada, Bystronic, Finnpower, LVD and others). To reach european quality level it is not enough only to have good direct purpose equipment – special ancillary machinery must be introduced in sheet processing. It is merely impossible to imagine sheet processing works in Europe without leveling and burrs removing plant. However in Russia only few sheet processors have introduced such equipment. But they have absolute competitive advantage. Comparatively small cost-price increase is compensated with usury by significant quality improvement and correspondingly increase of market sales.

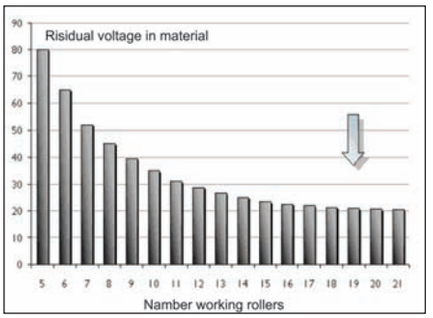
No doubt, in a few years use of such ancillary equipment will be normal in Russia, but market will be gained by pioneers.

Leveling equipment

This equipment is used before and/or after workpiece machining, depending on requirements. Punching, laser or plasma exert significant physical or thermal impact onto workpieces. This results to stresses in products which should be eliminated to obtain high quality of final products. Plate straighteners, or leveling machines, are used for this. Their action principle is the following: a machine tool contains rollers which bend metal thus eliminating stresses. Bending degree decreases gradually, and finallypasses to zero, and material becomes absolutely flat. Essentially, the more the number of rollers the better flatness could be obtained. However machine-tool cost also increases with the number of rollers. Thus an optimal number of rollers is needed for optimal result.



Fixed lower cassette with rollers



Equipment from German company **ARKU** uses an exact number of rollers to obtain necessary result. This allows, on the one hand, to decrease equipment cost, on the other hand – to obtain the desired result. **ARKU** company for over half a century develops leveling machines and tries to account all customers' wishes using the accumulated experience. For instance, **ARKU** developed so called fast rollers change system allowing cleaning working surfaces or rollers replacement in few minutes that is important for persistently high result. Now this system is standard for all ARKU machine tools. Machine-tools are easy to control – it is only necessary to set material type and thickness, and the rest will be done by a machine.

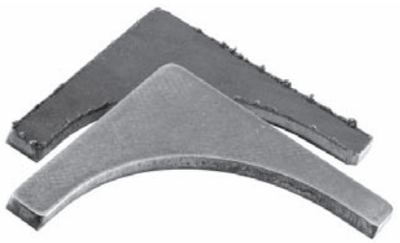
Fixed lower cassette with rollers

Furthermore, since that as in 1970s production from roll material started getting popular, the company began designing production lines with included punching modules, guillotines, stamps and other technological solutions for automatic production. Of course, leveling modules are built into these production lines since roll material is always bent.

Dressing equipment

This equipment is able not only to execute the set task, i.e. dressing. You'll get stable result with it. However, just like in any equipment, there is significant difference in efficiency, quality and convenience of use between dressing machines.

For instance, the most of wide belt sending machines are inconvenient in operation. Before laying a part on the conveyor belt it is necessary to wait until the previous one come out of the machine. Belts are expensive and their damage means long timeout and expensive repair. Furthermore, these machine tools badly cope with processed material thickness variations and nonflatness. Some companies offer machine tools with floating table to solve these problems, but they are also expensive in repair and their components wear out very quickly. However there is a solution attractive by its flexibility and reliability. Machine tools **Paul Ernst** are featured by an opportunity of processing variable thickness or uneven materials, galvanized or laminated, and only edges are cleaned. This result is obtained by using in the machine-tool grinding shaft covered with a soft porous material. This shaft is jacketed with sandpaper or non-woven material depending on purpose. Furthermore, these machine tools allow edges rounding, and if parts are obtained by laser processing, they allow oxide layer deletion from cutting



edge. At that machine-tools are simple to use, and sandpaper change takes only 3-4 minutes. Furthermore, even if the main grinding shaft is damaged anyhow it can be repaired on the place without taking out of the machine. If you need not only to process edges but also to grind surfaces, a machine tool can be equipped with grinding belt that will process workpieces surfaces. **Paul Ernst** machine tools may be integrated in production lines and therefore used at any factories.

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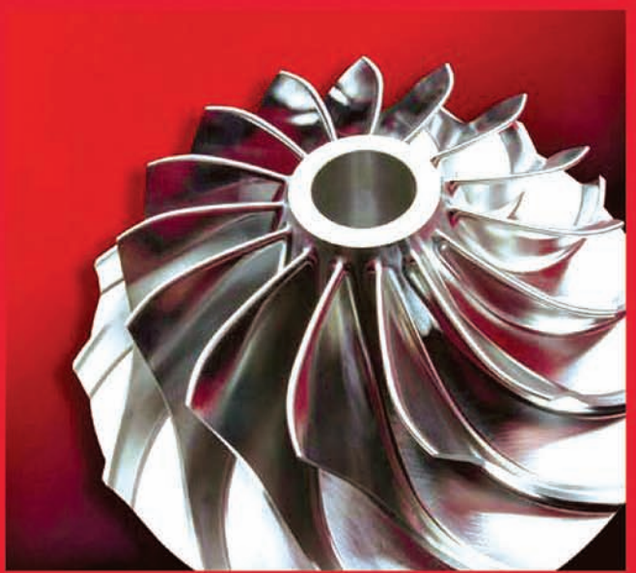

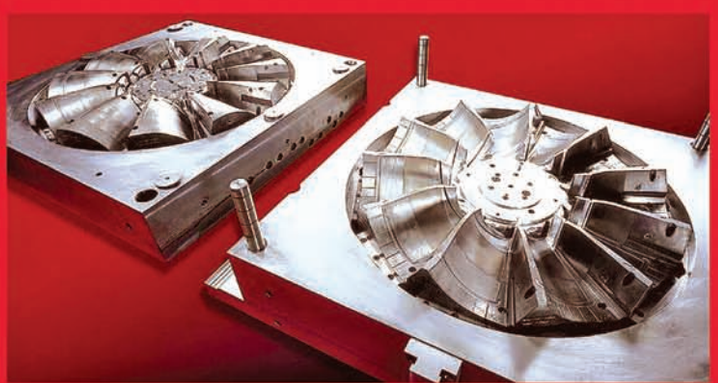

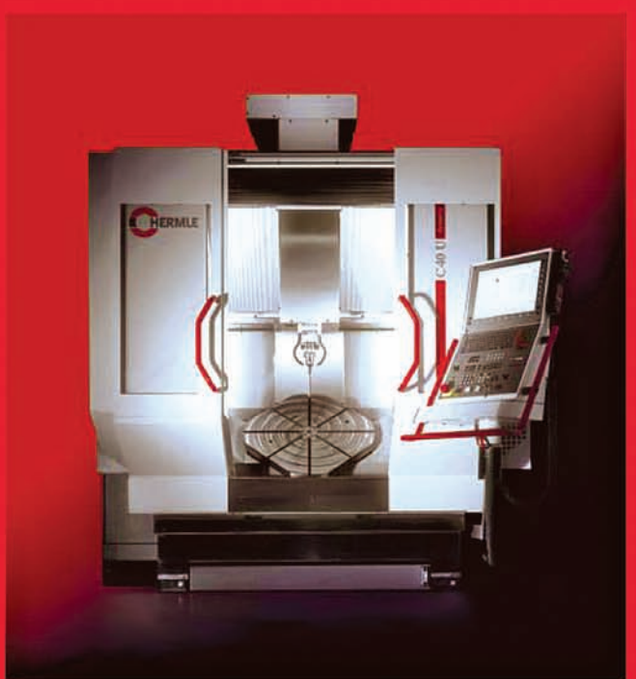

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Machine-tools «Dekor»

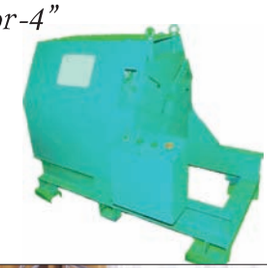
Due to construction industry development, including private houses construction, an interest to ornamental forging grows. Suburban houses owners accentuate uniqueness of their housings by laced forged gates and fences, skillfully made metallic pavilions, swings, stairway railings, fireplace accessories etc. Whatever it would be, forged metal is a sign of good taste anyway.

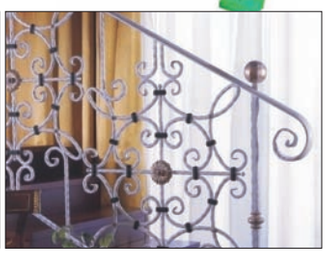
"Dekor-1"

"Dekor-2"

"Dekor-3"

"Dekor-4"





Forged items production spread widely thanks to undoubted profitability and prospectiveness. Production can be established with relatively small financing. One may start forging money having invested about 1.5 mln. roubles in equipment and monthly metal stock.

Available modern equipment for ornamental metal processing may fully satisfy requirements of small-series production. «**UralMetalGarant**» company offers such equipment on Russian market.

Machine-tools «Decor» series includes five machine tools of various purpose.

«**Dekor-1**» machine tool is designed for making elements of metal structures of square rolling 8 to 20 mm thick, round rolling 8 to 18 mm diameter, bars from 2x10 to 10x40 mm, profiled pipe max 40x40x3 mm.

Machine-tool's functions are making elements «volute», «tab», «pike», «scroll», «basket», «torsion» and others.

«**Dekor-1**» machine tool is designed for tracery application and metal rolling edges machining. This machine tool processes bars with cross-section maximum 60x10 mm, square bar 20x20 mm and round bar up to 20 mm diameter.

After machining on rolling units a material gets texture with relief ornament. Rolls set «cane» for round metal allows obtaining wood rind imitation.

Hydraulic press «**Dekor-3**» is designed for impart a clear geometrical shape to workpieces. Press force reaches 30 tons.

«**Dekor-4**» is a machine tool allowing making «twisted tube» between 32 and 159 mm in diameter. Such «twisted tubes» are used for making lamp-posts, gates, pavilions.

«**Dekor-universal**» machine-tool combines functions of «**Dekor-1**» and «**Dekor-2**» machine-tools and is a profitable acquisition for beginning private business.

Each machine-tool is supplied with operation manual with detailed information on preparation for work, connection and operation.

LC «UralMetalGarant» sends free video clip about equipment operation on request.

Warranty for machine-tools - 1 year.

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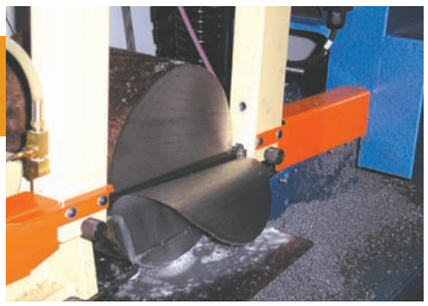
Contour band saws DoALL – a choice of domestic manufacturers!



LET'S WORK REDUCING COSTS!

DOALL MACHINE TOOLS ARE LEADERSA IN SAWING!

HALTEC-DoALL Company is an official distributor of the American company **DoALL**, - the only one hat produces all necessary for sawing: contour band saws, saws, lubricating and cooling liquids.

One of this series is the **C-916M** machine:

- high saw tension - 2100 kg/cm
- variator drive
- maximum torque available on the driving pulley
- this machine cuts hard-to-cut steels of large diameter without difficulty. Cutting is made by only 27 mm width saw.
- This machine is able to cut off a plate of 0.6 mm from the workpiece 220 mm (see photo) and cut off stainless steel 12X18H10T on its maximum diameter 280 mm only in 37 minutes.

SAW BANDS

With this machine tool customer obtains:

1) low saws outgo (2-3 pcs. per month at 1-shift work);
2) machine service life at least 10 years;
3) low operation costs (hard-alloy plates – service life 3 years, driving belts - service life 3 years);
4) high reliability, close to 1;
5) the most important – it cuts, and cuts excellently (see photo)

We have a wide range of contour band saws at our warehouse. Skilled experts will select contour band saws for you, provide high-quality installation, staff training and service.

Furthermore, **HALTEC-DoALL** company offers the complete range of saws and lubricating and cooling liquids (increasing saws durability by 30%), that will decrease costs of your sawing.

HALTEC-DoALL offers
FLEXIBLE DISCOUNTING SYSTEM AND AFFORDABLE PAYMENT TERMS

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ПАРАЛЛЕЛЬ
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Screw-cutting lathe	1M63-3000	530 000	Horizontal borer	2A620F1	1 700 000
Screw-cutting lathe	1M65-3000	1 000 000	Horizontal borer	2A622F1	1 900 000
Screw-cutting lathe	1M65-3000	1 400 000	Horizontal borer	2A636F1	3 500 000
Screw-cutting lathe	16A20F3 «NC 210»	680 000	Horizontal borer	2A635F1	3 000 000
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Turning and boring lathe	1516F1	1 600 000			
Turret lathe	1V340F30 «NC 210»	680 000	Machining centers	2206VNF4	2 500 000
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INDUSTRIAL ELECTRIC OVENS

Electric heating is widely applied in industry. It is easy to turn on and off, to adjust, to transport, and has many other features promoting wide spread of industrial electric ovens. Today LC «Uralelectropech» is the biggest manufacturer of industrial electric ovens, drying chambers, modular cabinets and technological equipment for various heat treatments in Urals region.

We began from manufacturing laboratory electric ovens commonly called as muffle. The former Soviet muffles production is now abroad. Laboratory electric ovens are generally universal, that allowed to arrange their mass production at that time and to create works as a base for future production of industrial electric ovens.

Electric ovens production is a very specific branch. As any other machine-building enterprise, it needs blank, welding and assembly works and good machinery. Machining volumes are very big.

Furthermore, a good refractory-lining area with experts-refractors and quite different equipment is necessary. Electric ovens production initially means need for large wiring zone. And the whole work is finished by experts in electronics, who provide instruments adjustment and carry out rather complicated electric ovens tests for many hours. For each zone experts are needed – workers, foremen, engineers-technologists. Oven production cannot do without own design bureau. Making reliable ovens means development of design gathering knowledge of various branches experts and work of various production zones. It's a very complicated task!

Today LC «Uralelectropech» continues widening product range and volumes of electro thermal equipment production. You can get more information about produced industrial electric ovens on company's website and in the catalogue from LC «Uralelectropech».

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Portable – the complete Renishaw XL80 system is placed in a really compact suitcase and weighs about 12 kg

Precise – precision of linear measurements is 0.05 ppm. Reading frequency of 50 kHz provides linear resolution of 1 nm at maximum linear speed 4 m/s.

Speed – keeping all advantages of a true interferometric system XL80 is easily and fast tunable saving time for measurements instead of adjustment.

Complete confidence – Renishaw instruments are distinguished by quality of development, manufacturing and technical support. It is especially important if dealing with micrometers.

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LASER TECHNIQUES EQUIPMENT MARKING ENGRAVING

Laser marking complex with diode pumping

For high-speed and precision use

DMark-06RL

Laser marking complex DMark-06RL is designed for application of texts and graphics on various surfaces within tasks requiring maximum speed and precision of processing typical for efficient mass production or applications demanding to graphics quality.

Laser marking on DMark-06RL means:

- **High accuracy at maximum speeds**
- **Low power consumption**
- **Air cooling**
- **Compact design**
- **High reliability and stability**

GENERAL SPECIFICATIONS:

Scanning device	2-axis galvanometric scanner RLA-1004AG/D2, RAYLASE AG, Germany
Processing area zone	120x120 mm
Character size	between 0.3 and 120 mm
Processing speed	between 1 and 4500 mm/sec
Hardware-software resolution of galvanometric scanning system	1.8 μm
Laser type	Nd-YAG with diode pumping and quality factor modulation
Power at 5 kHz	6 W (TEMoo)
Cooling	Autonomous, air
Radiation quality	M^2<1.5
Spot size at processing zone	60 μm
Modulation frequency	adjustable, up to 100 kHz

CLT equipment provides high quality, precise and efficient marking, engraving, precision cutting and holes drilling in various materials. High reliability of manufactured laser systems is guaranteed by using advanced designers' solutions and high-quality units, electronic and optic components.

DMARK-06

Laser marking complex "Mark-06" based on solid-state laser with diode pumping

Compact and economical plant for marking and engraving on metals and plastics not only in industrial but also in office conditions. An opportunity of integration into production lines for use in automatic modes is provided.

SKAT-501

Laser technological complex "Skat-501"

Deep technical engraving, bore drilling, cutting metals, ultrahard, ceramic, semiconductive and other materials with increased accuracy.

BETAMARK-2005

Precision laser marking complex "BetaMARK-2005"

High-performance marking and deep engraving of metallic and painted items, including large-sized, in industrial conditions in cases where additional moving systems and actuators are necessary. Integration into flow production line.

BETAMARK-2000

Precision laser marking complex "BetaMARK-2000"

High-performance marking and deep engraving of metallic and painted items, including those with higher wear resistance requirements due to greater depth. Integration into flow production line.

CENTER OF LASER TECHNOLOGIE

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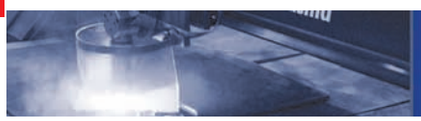

LASER TECHNOLOGY MARKET

The laser era started in the middle of the 20th century. The early stage of the industry development was marked by the urge of laser technology consumers and laser equipment manufacturers to increase their revenues by bringing their products to market requirements.. The first economically significant result in profits which was noticed at the market was achieved about 1970. From that moment, annual growth in the industry kept at approximately 20%.

WORLDWIDE, THE LASER INDUSTRY DEVELOPED IN THE FOLLOWING STAGES

- 1970s – overall revenue of about $2 mln;
- 1980s – considerable growth due to increase in demand for sheet metal cutting;
- 1991-92 – revenue growth of 0%;
- mid 1990s – laser welding introduced in automobile industry for the first time;
- 2005 – throughout the industry, about 35,000 laser units is used of about $1,3 bln in cost, the revenue of industrial laser system sales amounted to $4,4 bln [1].

In 2006, the world market of industrial lasers and laser services consisted of:

9% – cutting
46% – marking
45% – other purposes.

The revenues from laser system sales broke down as:

40% – cutting systems
15% – marking systems
45% – systems for other purposes.

MARKING AND ENGRAVING

This market share generates almost 15% of all revenues from laser systems. In 2006, 16,000 solid-state and CO2 laser markers were sold and installed. It is probably the most mature market today, at least that the laser markers is the product that most fully answers the demands of end users in regard of convenience and safety, manufacturers warranty and post-warranty service. It has the most developed technology and software.

CUTTING

Sheet metal cutting is another example of laser technology usage on the global scope. The same sheet metal is being cut in China, Mexico, Canada, etc – instrumental stainless steel and aluminum alloys of approximately the same thickness, at about the same speed and performance. Small enterprises offering laser services cover large part of the market due to their flexible approach, fast execution and delivery to any place in the world. It's no surprise, then, that the laser metal cutting took over some part of traditional technologies, such as plasma or hydroabrasive treatment.

The power capacity of laser sources grows along with the growth of demand for cutting system performance and metal thickness. While in 1970s, the most used CO2 systems had the capacity of 500 W, the solid-state and CO2 laser systems with less than 2.5 kW are not in much demand today. Leading manufacturers of cutting machines use 5-6kW sources. High-duty fiber lasers from IPG Photonics are three time more effective than CO2 lasers [2]. Thus, a 1 kW fiber laser should be compared to a 3 kW CO2 laser.

Today, the technology used in laser cutting machines is developed to the level that the performance and quality provided by all vendors are approximately the same, which considerably decreases the cutting prices. For example, 4000 laser companies work hard to keep profitable by this service only. To raise their profits they have to increase the performance not only by increasing cutting speed, but by optimizing the sheet layout to reduce the wastes, optimizing the cutting shape to increase the speed of corner contouring, and by decreasing the refuse percentage. Russian companies tackle the same problems by raising the performance and widening the spectrum of laser services.

ThomasNet.com company carried out an informal inquiry of laser companies regarding their services. The results showed that there are approximately twice as much cutting companies than welding companies. And there is still twice as much of those working in both cutting and welding. However, only 10% companies surveyed offer multi-coordinate cutting and welding.

Laser tools manufacturers made a real breakthrough in the last two years. For example, the gas feed systems and control systems for the equipment produced by Mitsubishi company [3] are developed to the extent that it takes an operator only 15 minutes to change the 14-16 mm iron cutting head for the 3D welding head on the same machine. Similar attempts to do cutting and welding using the same machine are already being made in Dubna, Russia.

WELDING

About 11% of solid-state and CO2 lasers are used in welding systems for various applications, from micro-welding in dental and surgical equipment production to body welding in automobile production.

Any welding technology (process and equipment) is designed for the end product, including laser welding. However, laser welding usually is used in new production lines rather than as a replacement fro the existing welding tools. This is one of the reasons why laser welding takes only 10-15% of laser market. Laser tool manufacturers are in constant search of the areas to introduce large amount of uniform equipment.

Automobile industry is best suited for this, and lasers are already being widely used for car body and frame welding. Although it is not the automobile production industry worldwide that uses the largest amount of laser welding systems, the demand in this area isn't likely to decrease because of constant emergence of new car models. Among laser system users are the manufacturers of railway cars, agricultural, refrigeration, chemical, professional kitchen and restaurant equipment, furniture, as well as the advertising companies.

Welding of body and suspension for automobiles or railcars is a typical application of solid-state laser welding systems. Although these areas are also not among the biggest consumers of lasers, they are most profitable due to the complexity and cost of the articles produced.

MICRO- AND NANOTECHNOLOGY

Applications in this area refer to laser processing of micron-scale materials. In 2005, the sales of industrial lasers of these types took about 12% market share which is less than 15% of the previous year. This decrease can be considered as temporary due to overall downturn in world electronic industry. In the next decades, this application area is predicted to grow markedly.

The biggest market share is taken by two basic micro-processing laser applications – through drilling of micro-holes both in metals and non-metals and catheter drilling and cutting.

The first application potential is based on the microelectronic industry development, while the second one is backed by constant growth of state and private investments in health industry. Among other applications, fast prototyping and nanoprocessing should be marked, that is processing of materials with more that 1 micron precision.

Nanoprocessing technology is mostly based on laser ablation, producing such items as jet elements for jet printers, thin film resistors for LED-displays used in aviation, and filters with high-precision calibrated holes for medical instruments, catheters, etc.

Microholes boring was traditionally carried out using high quality CO2 lasers, first harmonic solid-state lasers and, in some cases, eximer lasers. Lately, fiber lasers tend to occupy this market.

WORLD MARKET STRUCTURE BY LASER TYPE

Up to now, the CO2 and solid-state laser were the most popular due to existence of mature technology, equipment technical stability, well-developed service and maintenance system. Recently, the emergence of powerful fiber lasers shifted the marked structure. These lasers are still too expensive, but further development will surely decrease their price.

Other laser types – eximer and diode – keep occupying a small market niche of photolithography and microprocessing.

David Belforte, a laser expert, estimated the share of CO2 lasers as 58% by the number of items and as 52% by the revenue from sales of the systems with such lasers in 2006. Solid-state lasers, including fiber lasers, take 40% of the market by the number of systems and 44% by revenue. Other lasers take 2% by the number of items, 4% by revenue from laser sales, and 2% by revenue from laser system sales.

High-duty CO2 lasers show excellent performance ($/W). Slab CO2 laser manufacturers manage to achieve high quality emission at 6 W. The development of high-duty diode and fiber lasers reduced their cost-performance down to $40/W.

This resulted in livening the machine tool users' interest in these systems.

THINKING OF DESIGN, THINK OF LASERS

How to raise the effectiveness of industrial applications of laser technologies? This question should be addressed to the designers and developers of the next generation of lasers, since 70% of the cost and quality of the product is laid down on the design stage. To achieve this, the technical requirements for the allowances, materials and laser capabilities and the corresponding documentation should be developed and made public. Still more important is the most advanced education of the new generation of laser experts.

One can already see positive shifts in this direction in Russia with several central and regional technical universities raising the number of laser technology departments and divisions having direct links to industry.

THE MOST IMPLEMENTATION -READY APPLICATIONS

Marking (engraving), cutting, drilling, welding are still the most mature applications. However, the industry shows growing interest in thermostrengthening, alloying, laser soldering, prototyping and microprocessing.

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[2] Lothar Morgentpal.
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[3] Richard Green.
Combining 2D and 3D laser applications. Mitsubishi Corp.

IPG IRE-Polus

NTO «IRE-POLUS»

FIBER LASERS
FOR INDUSTRIAL APPLICATION

5000 W

- Cutting
- Welding
- Hardening
- Cladding

400 W

1000 W

- *Power up to 30 kW*
- *Efficiency up to 30%*
- *No consumables and adjustable elements*
- *Feeding fiber up to 200 m*
- *Pumping unit life time > 50,000 hours*

- Marking
- Engraving

100 W
Air cooling

20 W
Pulsed, 1mJ

1 Vvedenskogo sq., Fryazino, Moscow region
Phone +7(495) 702-95-89, fax +7(495) 702-95-73
mail@ntoire-polus.ru

www.ntoire-polus.ru

KS-3 «NAVIGATOR»

INDUSTRIAL COMPLEXES FOR LASER CUTTING

JSC «VNITEP» produces industrial complexes for laser cutting **KS-3 «Navigator»**.

This complex has an original patented structure. It allows obtaining highest reliability, precision, efficiency and operation convenience.

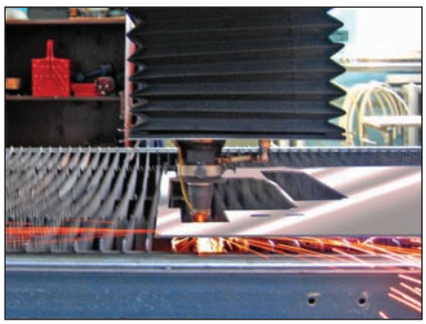
The coordinate table of the **KS-3 «Navigator»** laser cutting complex contains components from the world leading manufacturers: linear ball guides from **INA**, flexible cable channels **IGUS, NC** system **DELTA TAU**, protective dampers and pneumatic system - **FESTO** and **CAMOZZI**, linear motors - Ruchservomotor and Siemens.

During development of the coordinate table for this complex the problem of linear motors control at high speeds has been solved.

Due to absence of mechanic transmissions optimal loads distribution the coordinate table is highly reliable (over 100 000 km of travel) and does not need highly skilled service.

- The coordinate table is fitted with changeable pallets allowing fast workpieces change.
- Sheet profile tracking system allows cutout at speeds up to 60 m/min.
- The coordinate table design excludes its moving parts seizure at high motion speeds.
- The complex can be equipped with various types of lasers:
- CO2 lasers - TL-700 – up to 1 kW (Technolaser), DC010-DC030 1-3 kW (Rofin Sinar) – fiber lasers 0.5-5 kW (IRE - Polus).

The coordinate table allows cutting head movement with linear acceleration up to 20 m/s^2 along each axis; contour acceleration – up to 16 m/s^2, linear velocity of operational movements up to 60 m/min, idle speed up to 150 m/min. The repeatable trajectory accuracy of 5 m remains at these speeds. These parameters are obtained both due to coordinate table structure optimization and perfect NC system.



Processing area of **«NAVIGATOR»** is 1550x3050 mm, overall complex dimensions are 2700x9800 mm. These parameters allow reducing production facilities area.

Average power consumption of laser cutting complex **KS-3 «Navigator»** with fiber-optic ytterbium laser 1 kW is 26 kW.

Design features of the coordinate table allow:

- efficient workspace use, workpieces movement both along and across the machine tool,
- coordinate table scaling, i.e. fast manufacturing and modernization of coordinate table to obtain higher dynamic characteristics,
- installation without special foundation.

Our partner producing fiber-optic lasers is an international company **IPG photonic**. Fiber-optic lasers have exceptionally low power consumption due to their high efficiency factor, low output ray pencil divergence and higher radiation absorption factor by metals comparing to CO_2 lasers.

These lasers do not require special gas mixes.

Gases used for cutting: oxygen, air, nitrogen and argon for titanium.

Gas consumption depends on material type and thickness and on cutting length.

1. Main specifications of the KS-3 coordinate table on linear motors	
Overall dimensions	
Length	9800 mm
Width	2700 mm
Height	2100 mm
Weight	11500 kg
Power supply	380-415V/3 ph./ 50Hz/20kW
Processing area	
X/Y/Z	3050/1550/270mm
Idle movements maximum speed	
X/Y/Z	150/150/60 m/min
Working movements maximum speed	
X/Y/Z	60/60/60 m/min
Maximal accelerations	
X/Y/Z	20/20/20 m/s^2
Bars resolution	0.5 μm
Positioning accuracy	10 μm
Repeated positioning error	10 μm
Maximum workpiese weight	800 kg
Maximum workpiese height	200 mm

2. Materials characteristics
Machined parts thickness
steel – up to 12 mm
aluminum and alloys – up to 6 mm
stainless steel – up to 6 mm
Material:
Carbon steel Ст3, Ст10, Ст30, Ст45, low-alloy structural steel 09Г2С, 09Г2Д, 10ХСНД, stainless steel 08Х18Н10, 12Х18Н10Т, electric steel, transformer steel.
Aluminum and its alloys - АД0, АД1, АМг6, АМц, АД-31
3. Basic kitting of the KS-3 «Navigator» laser cutting complex with ytterbium fiber-optic laser YLS-1000
• coordinate table
• laser
• cooler
• filtering and ventilation system;
• compressor unit
• shuttle pallets
• NC system with pendant and operator's panel
• warranty for mechanical parts – 24 months
• for the NC system - 12 months
• software - CNC-CAD
• commissioning
• training for 2 persons

JSC «VNITEP»
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demidov48@mail.ru
www.vnitep.ru

SCANER PLUS

LC «**Scanner-Plus**» was established in 1999. Company's employees are experienced in laser equipment and programming, they work in this field since 1982. They took part in development and implementation of first generations of lasers.

During its business life the company have grown from making simple laser markers to the level of branch leaders in development of newest laser complexes providing high-quality cutting, welding end engraving of various materials – steel, non-ferrous metals, plastics.

An undoubted success of our team is the creation of "Marker 1/20Z" complex providing high-quality engraving without distortions of both planes and curved surfaces (cylinders, spheres etc.), using variable leaser beam focusing depth and mathematical correction (programming) its path, - this technique excludes use of mechanical turners of the engraved object.

NEW!

SPECIFICATIONS

COMPLEX MARKER-1/20 Z FOR LASER MARKING

Working area (field) size, mm	100 x 100, 200 x 200 (changeable lenses)
Focusing depth*, mm	up to 20 (for 100x100 field size), up to 100 (200x2000 field size)
Beam movement speed, mm/sec	adjustable, over 2500
Steel processing speed, mm/sec	over 200
Types of output images	bitmap, vector, bar-codes
Materials marked	steel, non-ferrous metals, some types of plastics
Laser type	ytterbium, pulse, single fiber, ILMI-1-20 series, with a wavelength 1.05 – 1.07
Average power, W	20
Pulse energy, MJ	0,95
Cooling	air, autonomous
Power consumption, kW	0,8
Laser life time, hours	over 30,000
Scanning system	OptiScan 100/200Z based of deflectors 6220 (6240) from Cambridge Technology, including:
• Optical head for scanning with focused laser beam;	
• Laser pencil collimator with programmable aperture and Z-coordinate;	
• «Pilot» laser for marking engraving contour if necessary or simulating engraving.	
Complex overall dimensions, mm	1200 x 800 x 1500

* Focusing depth is a marked surface height differential

MARKER-1/20

Overall dimensions of the complex **1200x800x1300.**
Complex weight, kg **140**

A generation of modern marking complexes based on pulse fiber lasers scientific and production association "IRE-Polus"

MAIN FUNCTIONS OF «SCANVISOR» ® SOFTWARE

- Testing and adjustment of system hardware and external devices.
- Setting the engraving technological parameters.
- Setting an automatic plant operation mode if included in production line.
- Modes of multiple information output, «package» execution mode for various software with graphic binder, subprograms execution mode.
- Contour (vector) and bitmap engraving modes.
- Laser beam «spinning» mode for wide line engraving.
- Graphic information import from various editors.
- Setting an automatic numbers changing mode in a lot of engraved items.
- Correction of image distortions on curved surfaces to obtain identical images.
- Creation of technological modes library.

MARKER-1/20 COMPACT

Overall dimensions of the complex, mm **850x650x600mm**
Complex weight, kg **30**

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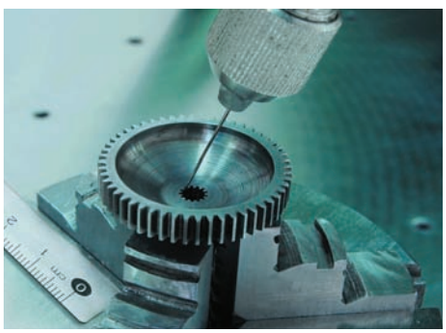
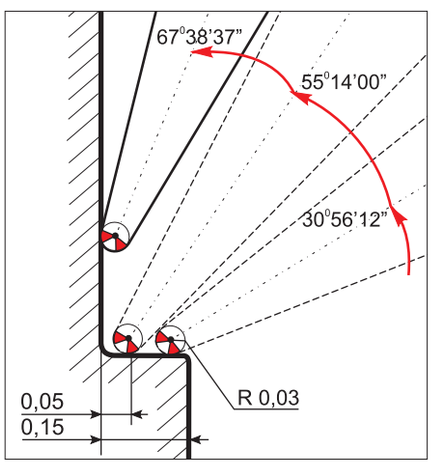
NEW TECHNOLOGIES OF PARTS MEASUREMENT IN MACHINE BUILDING



Six-axis coordinate measuring machines represent the newest level of measuring equipment. This equipment is unique due to wide measurement range. One model of coordinate measuring machine controls both standard parts and parts designed on the base of higher order splines.

A new step in measuring fine detailed parts was made by development special programs for control by probe with a very small radius of probe end (0.03 mm) that must be less than radius of closed surfaces joint. Measurement is made by touching parts with measuring needle in a partial load mode.

To solve this problem a quick probe testing is carried out resulting in fulfillment of precision measurement condition.



Determination of probe end parameters now allows part measuring according to set program with high precision (up to 1 μm). These touches are executable with six-axis design of coordinate measuring machine from LC «Lapic» that makes smoothly controlled inclination of measuring device.

Using this measuring method on coordinate measuring machines it is now possible to control fine pitch gears, small pitch threads, internal splined holes (see photo) etc.

Six-axis coordinate measuring machine has many advantages and is a necessary element of modern machine building.

LAPIC

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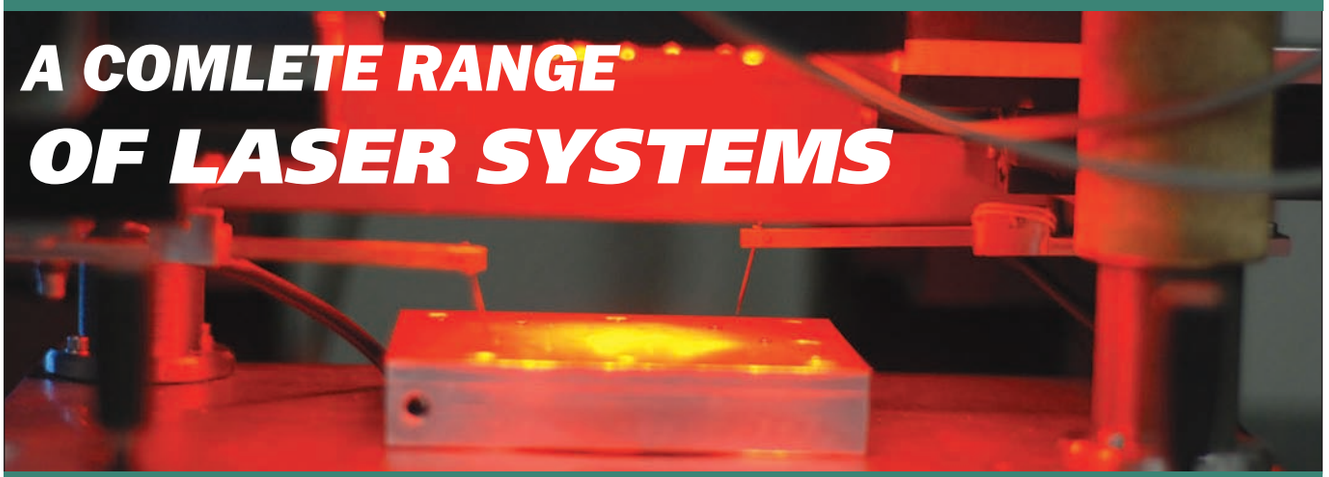
ESTO LASERS & APPARATUS TM
SPECIAL ELECTRONIC TECHNOLOGICAL EQUIPMENT



Scientific and production center “lasers & apparatus” – Esto Co is now a recognized Russian leader in development, production and application of technological complexes for material processing with over 15 years of experience in this field.

OUR HISTORY

Scientific and production center «Lasers and equipment TM» was established in 1991 by leading experts of Research and development institute “Zenit” in Zelenograd. During first years the center worked in three directions: components and solid-state lasers for material processing, reconfigurable lasers for scientific research and medical equipment on the base of erbium lasers.

Since **1996** the main direction of center’s activity is development and industrial application of new generation of complete technological systems for material processing.

Previously we have been developing most of our complexes on the base of solid-state lasers with lamp pumping generating laser radiation in the power range of 0.5 - 1 kW. In the recent years we began to use new types of lasers – gas, fiber, diode pumping etc.

Nowdays are own scientific and production resourses allow not only serial production of technological complexes but also scientific research and development. We develop techologies in both traditional applications (welding, cutting, standard materials engraving) and new technologies: composite materials processing, micro-machining, functional adapting etc.

In **2002** to improve complex works organization, enhance production quality and volumes we together with our partners – JSC “Electronservice” and “ESTO-Vacuum” ltd. – established a closed joint-stock company

NPP «ESTO» (Electronic special technological equipment), acquired and equipped production building over 2500 sq. m in the town of Zelenograd.

In **2007** we and our partners established an innovative company Esto Co and began realizing a new project in the Special Economical Zone “Zelenograd”. This project is to develop latest achievment of russian and world’s science in the fields of laser and vacuum technologies. Realization of this project within state and private capital partnership will bring us up to the new levels of quality and competitiveness of our products.

OUR EQUIPMENT

SERIES 1 – PRECISION MICROMACHINING

Application:
Precision laser micromachining (scribing, cutting, milling, holes drilling) with minimal defective zones sizes.

Microcircuits wafer-plates production, micro-holes, cutting etc.

Materials:
polycor, ceramics, sapphire and other hard-to-machine materials, thin sheets of ferrous and non-ferrous metals (copper, brass, aluminum) and others.

Models:
ML1-1, ML1-12 – pulse solid-state lasers with lamp pumping.
ML1-14 – lasers with diode pumping.
ML1-2 – lasers on copper vapours (gas lasers)

SERIES 2 – MARKING AND ENGRAVING

Application:
Industrial products marking, identifying and protective coding of industrial samples. Inscription of dashboards, measuring tools, keyboard fields, making marking and mimic plates and shields.

Ornamental and serial marking of indus-

trial products and souvenirs.

Marked materials:

Steel, aluminum, titanium, copper alloys, painted metallic surfaces, ceramics, plastics, semiconductors, label foil and others.

Models:

ML2-1 (ML2-1LK) – Nd: YAG laser with lamp pumping;

ML2-12(ML2-1D) – solid-state laser with diode pumping;

ML2-14 (ML2-1V) – fiber-optic ytterbium laser.

SERIES 3 – CUTTING

Application:

High precision and quality cutting and complex shape contour cutting of metal sheets with the thhicknes up to 4-5 mm for steel, 3-4 for aluminum, 2-3 for brass and copper. Engraving, holes drilling, metal items drilling.

Models:

ML34 – «cross tables» (a workpiece moves along X and Y axis, optical cutter is steady);

ML3 – «semi-portal tables» (optical cutter moves along X axis and a workpiece - along Y) axis;

ML35 – «portal tables» (optical cutter moves along X and Y axis, a workpiece is steady).

SERIES 4 – WELDING AND DIMENSIONING

Application:

Manual and automatic spot and seam welding according to any drawing. Additional functions: cutting, engraving, holes drilling in metals, polycor, ceramics and other materials.

Models:

LTK4 – a compact laser technological device for small-sized items welding.

LTA4 – a laser device with wide energy potential for welding linear and circular seams and dot welding of various items.

ML4 – superuniversal laser device for welding and dimensional machining of various materials (cutting, drilling, engraving).

SERIES 5 – RESISTANCE TRIMMING

Application:

Exact trimming of passive electronic components (resistors, condensers, resistor sets and chip resistors, bridges cutting, functional trimming etc.). Single and group trimming of components made on thin or thick film technology in manual, semi-automatic and automatic modes is

also possible.

Models:

ML5-1 – single channel measurement, probes are set by an operator. Manual spot movement control (from joystick)

ML5-2 – single channel measurement, semiautomatic and automatic operation modes. Each of two probes is set onto XY coordinate table and controlled by a computer.

ML5-31, ML5-32 – multichannel automated devices: multipositional probes (multiprobe cartridges) for group trimming, automated Z coordinate (lift) and automated coordinate tables for carrier movement. Multichannel CIS with multiplexing.

To consult about applications andtechnological perfomance capability and to order the systems do nothestitate to contact us! We will be glad to answer your questions!

ESTO LASERS & APPARATUS TM
SPECIAL ELECTRONIC TECHNOLOGICAL EQUIPMENT

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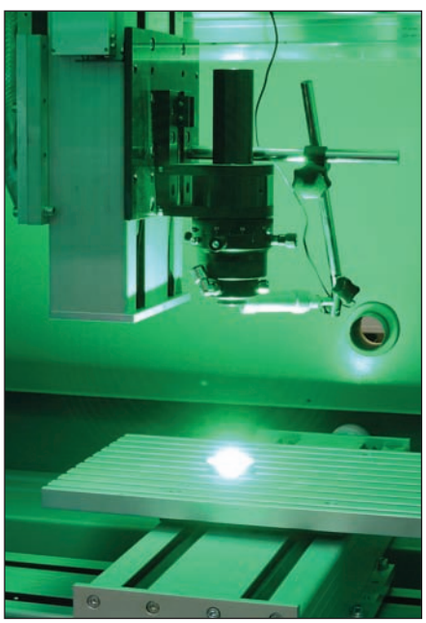
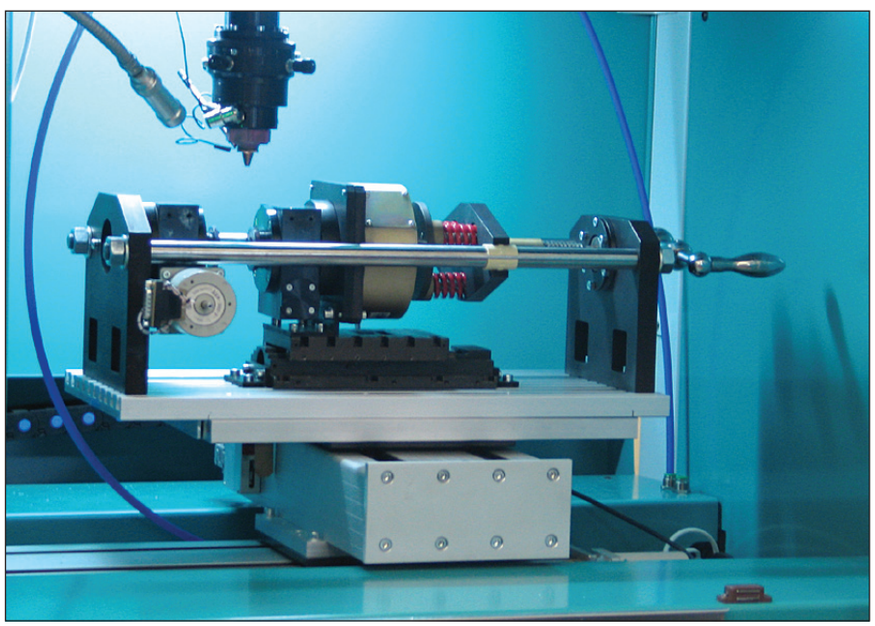




SCIENTIFIC AND PRODUCTION COMPANY TETA

PRODUCES SERIAL AND SPECIAL LASER EQUIPMENMT FOR CUTTING, MARKING AND WELDING

The company was established in 1991 and operates on Russian market successfully.
Over 100 our plants are operated in Russia now.

Cutout laser complexes TEGRA-500R
(basic model)

Laser type – YAG: Nd
Radiation power – 500 W
Cutout field – 1.5 x 2.5 m
Accuracy – not less than 0.1 mm
Processed materials:
steel (including stainless),
aluminum alloys (thickness up to 6 mm)

Advantages:
- the lowest price in this class
- low operational costs
- long experience of operation by customers

TEGRA-500R can be fitted with additional devices providing:

• precision cutting of various shape holes in steel and aluminum pipes up to 3m length

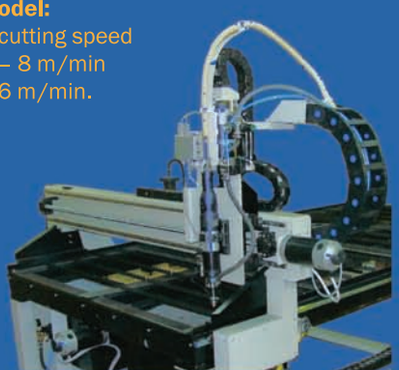
• cutting slots and holes in rectangular tubes, e.g., in trade equipment production

Universal laser engraving plant TEGRA-MB
(industrial version)

- Laser type – ytterbium, fiber optic
- Electromechanical table elevation system
- Automatic focusing
- Optical system of the marked part orientation along axis
- Optical system of the engraved text or picture visualization and lens focusing
- Radiation parameters and software on the world leading level
- A number of automated complexes introduced aviation industry, instrument making, bearing making and defense industry are developed on the base of «TEGRA-MB» plant

Laser technological complex «TEIR-400, 600, 1000»
based on fiber-optic laser with 400, 600 or 1000 W power

Designed for high-sped cutout of ferrous metals and steels.
«TEIR-400» model:
ferrous metal cutting speed
1.2 mm thick – 8 m/min
2 mm thick – 6 m/min.



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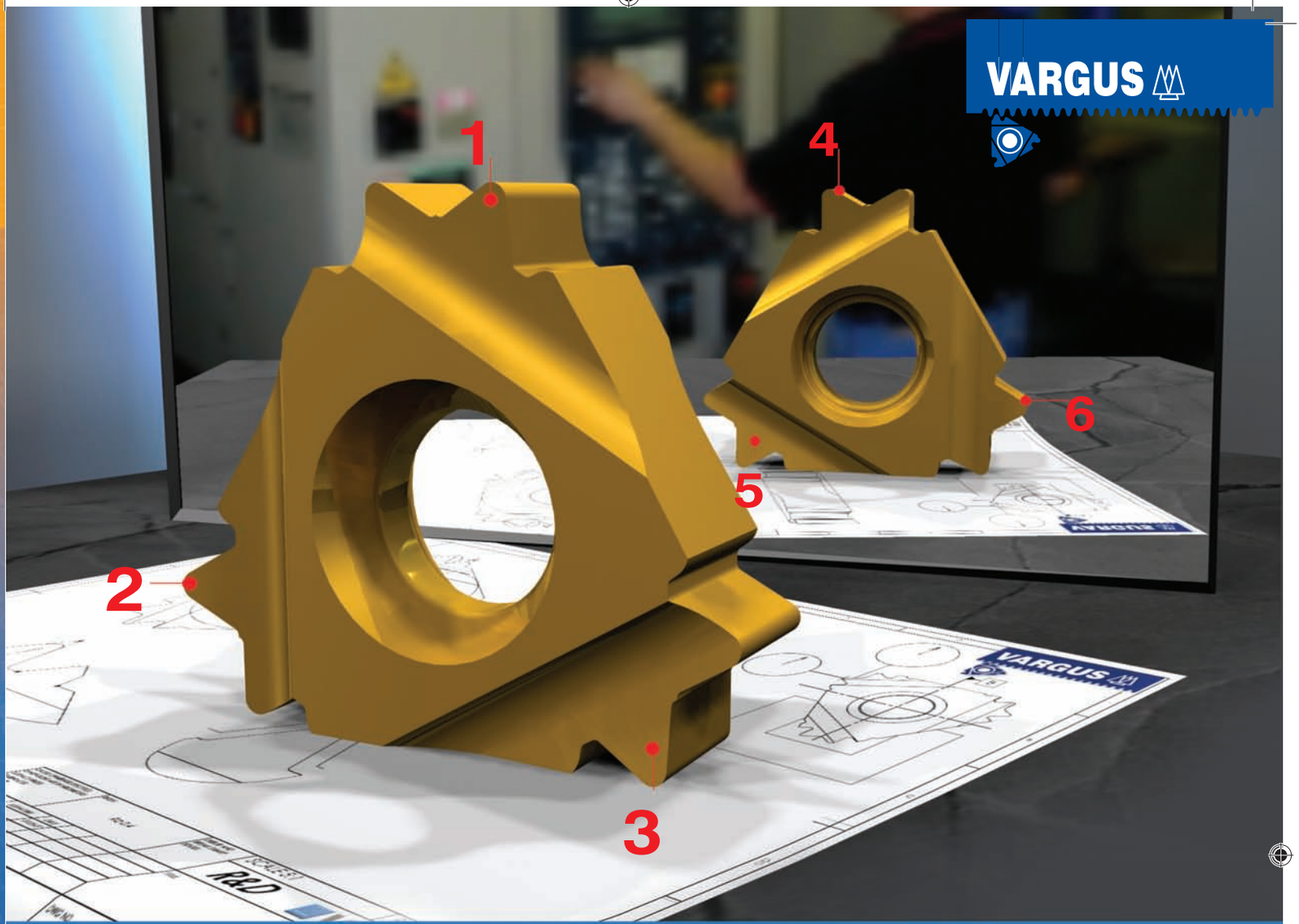
E-mail: teta-laser@msn.ru, www.laser93.narod.ru Director – Oleg O. Silichev

VARGUS

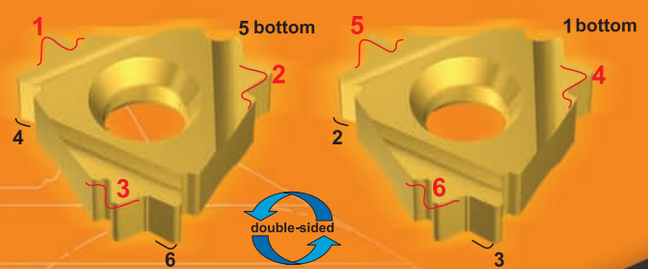


INNOVATING SOLUTION FOR THREAD PROCESSING

JSC «Instrumentalnaya technika» presents new generation multisided threading inserts V6: threading inserts with 6 independent threading teeth.

V6

6 threading teeth



V6 insert features:

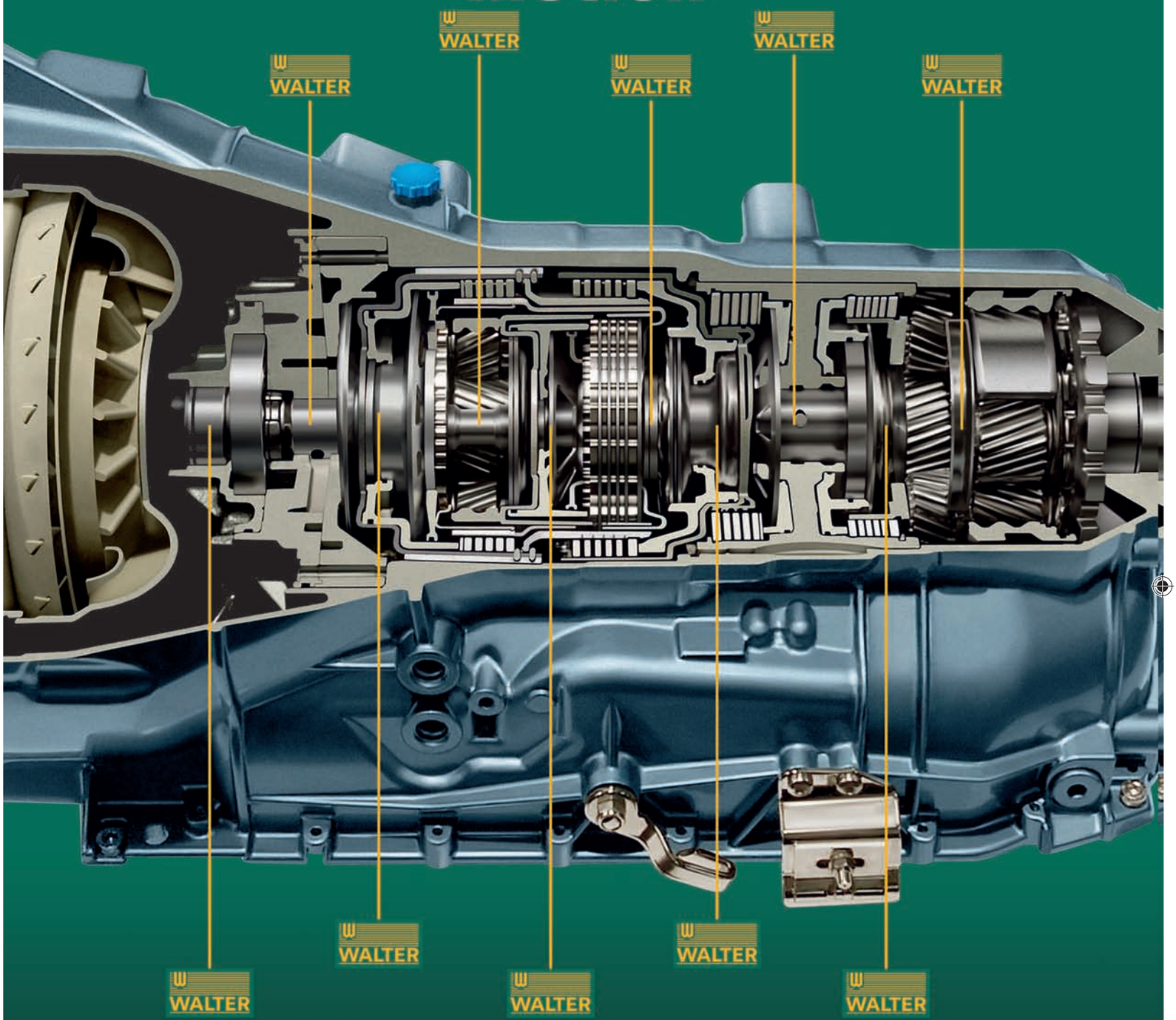
- **6 independent threading teeth**
- **fits standard holders**
- **decreases expenses on tooling**
- **provides exact positioning for each of 6 threading teeth**
- **increases threading plate lifetime twice**

PATENT

International patent
No. PCN/1B2007/001516 from 2007.06.04
German patent
No. 10 2006 028 062.8 from 2006.08.12

Representative in Russia: JSC «Instrumentalnaya technika»,
14 build, 5, Poslannikov per., Moscow, 105005, Phone: **(495) 540-70-68**, Fax: **(495) 540-70-69**

At the heart of perpetual motion



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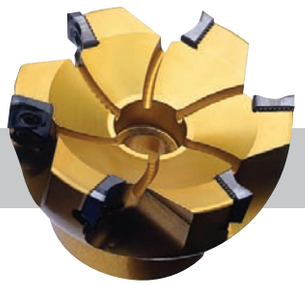


Polycrystalline diamond tools

Modern productions begin the wide use of polycrystalline diamond tools for aluminum alloys processing. These tools are featured with high resistance and efficiency of mechanic processing. This trend is due to high silicon content in modern aluminum alloys unlike their former analogs; therefore they have higher strength and require more thorough tool alloy and shape selection. Meanwhile polycrystalline diamonds tools production technology changes and market competition decreased its cost significantly

POLYCRYSTALLINE DIAMOND

Polycrystalline diamond consists of microscopic diamond parts and bonding agent. Parts sinter under high pressure and temperature, and extremely hard material with unique properties forms. Direct bonds form between diamond grains, and only few bonding islands remain unlike polycrystalline cubic boric nitride where particles are not bonded directly.

Polycrystalline diamonds are classified by grain size, average values are: 2 μm (shallow polycrystalline diamond), 10 μm (medium-grained polycrystalline diamond) and 25 μm (coarse-grained polycrystalline diamond).

Coarse-grained polycrystalline diamond is stronger and more resistant than shallow and medium grained. It therefore provides high wear resistance at rough work. At the same time coarse-grained polycrystalline diamond does not provide high surface quality and therefore is not used for finishing.

DECLINE IN PRICES FOR POLYCRYSTALLINE DIAMONDS

Price was a main barrier for wide spread of polycrystalline diamond tools. But in the recent years it decreased about twice because supply is higher than demand.

In early 1990s polycrystalline diamond had overcome carbide in most of characteristics. At the same time new manufacturers of polycrystalline diamonds appeared and prices began to fall. Prices decline is also explained by refinement of polycrystalline diamond tools production technology refinement: electric sparking equipment was upgraded significantly, prices for diamond wheels used for polycrystalline diamond tools edges grinding decreased.

MODERN ALUMINUM ALLOYS

Aluminum alloys are light-weighed, and silicon makes them stronger and more wear-resistant; furthermore, silicon addition as an alloying element decreases thermal expansion factor of the material.

Silicon percentage determines not only characteristics of aluminum alloy but also its machinability. Aluminum alloys with 12.6% of silicone are called eutectic. If silicon content is above 12.6%, alloys are called hypereutectic, silicon within them is represented by hard particles within aluminum base. If silicon content is below 12.6%, alloys are called hypoeutectic. Hypereutectic alloys are the most strong, wear resistant and the least prone to fatigue breakdown, but at the same time they are processed by cutting rather badly. A sharp and wear-resistant tool is necessary for cutting hard silicon particles, otherwise these particles will be pulled out from the base material and machined surface quality will be unsatisfactory.

Softer aluminum alloys are also not easy for cutting: problems with chip-breaking and built-up edge appear during their machining.

Furthermore, there are composite aluminum based materials which can be thought as logical continuation of hypereutectic alloys idea. In these composite aluminum based materials ceramic or other fibers or particles imparting special properties to the material are placed instead of silicon. At the same time aluminum matrix remains light-weighed.

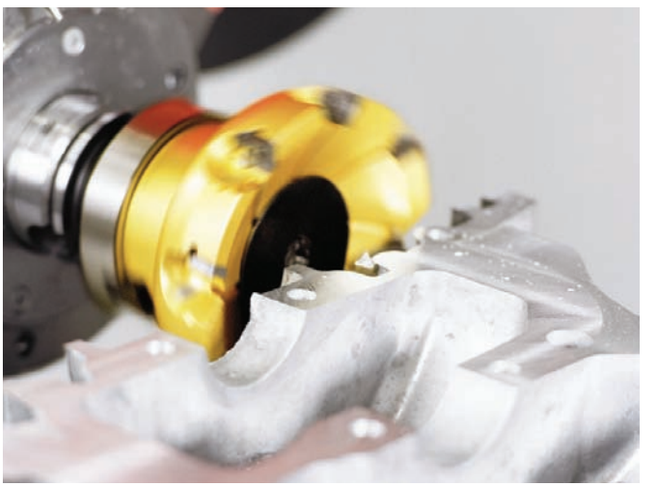
TOOL SELECTION

Polycrystalline diamond tools show approximately 20 times higher wear resistance and 3 times higher cutting speed compared to carbide tools. To process silumins with small or medium silicon content shallow or medium grained polycrystalline diamond is recommended. To process silumins with high silicon content coarse-grained polycrystalline diamond is recommended. If problems with surface quality appear during high-silicone silumins milling, it is recommended to use on a milling cutter one insert with Wiper geometry made of shallow polycrystalline diamond.

Selection of any tool, and especially tools of polycrystalline diamond, should be approached with great care, and expert consulting is desirable. For instance, steels cannot be processed by polycrystalline diamond since the last comes into chemical reaction with carbon contained in steel and wears rapidly.

Generally use of polycrystalline diamond tools with positive front angle is recommended, but for rough work tools with negative front angle may also be used thanks to high sharpness of cutting edges.

Cutting edges of polycrystalline diamond tools remain sharp or small protective bevel is applied. Finishing turning feed are about 0.1 mm/rev and roughing turning feed is about 0.4 mm/rev.



Polycrystalline diamond tool

HIGH HARDNESS – HIGH CUTTING SPEED

Hardness of polycrystalline diamond is high but its strength still leaves much to be desired compared to carbide and all the more so to high-speed steel. Cutting edge microchipping is one of the main types of polycrystalline diamond tools wear. This microchipping is often due to vibrations during processing. A system “machine-tool – rig – tool – part” must be highly rigid for efficient work with polycrystalline diamond tool.

It is also necessary to keep recommended machining speed that is approximately 3 times higher than that for carbide tools.

Polycrystalline diamond tools in the most cases represent carbide insert with soldered polycrystalline diamond insert. In using such tools there is a risk of soldering out polycrystalline diamond insert due to high temperature in the cutting zone. If such problem appears, cutting speed and/or depth (which generally should not exceed 60% of cutting edge length) should be decreased.

Use of lubricating and cooling liquid is not obligatory for machining aluminum alloys by polycrystalline diamond tools, but is recommended for drilling and bore machining for efficient chip evacuation and cutting edges cooling.

The best way of polycrystalline diamond tool selection is asking for advise in tool company. In this case you’ll get the best result at minimum cost.

Dmitry Trenev,
Manager, MS company
dtrenev@mirstan.ru

New servo-drive Digitax ST from Control Technics

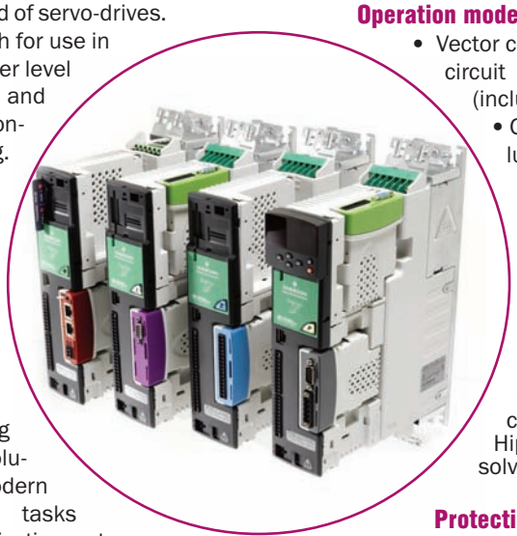
FLEXIBLE, COMPACT, SMART

Digitax ST – an ideal solution for your task

The **Control Techniques Company** (Great Britain), one of the leaders on the vector controlled drives market, announced beginning of new **Digitax ST** servo-drives line.

Digitax ST servo-drive is a newest alternating current electric drive for servomotors between 0.72 and 19.2 Nm, combining intellect of PLC, small overall servo-drive dimensions and traditional **Control Techniques** electric drives flexibility.

Digitax ST corresponds to all modern trends in the world of servo-drives. It is designed both for use in systems with upper level PLC (see fig. 1) and in distributed control systems (fig. 2). Distributed control systems building on the **Digitax ST** base is possible using software and user applications module SM-Application, allowing fast and easy solution of many modern machine-building tasks such as synchronization, cutting, winding etc. due to standard libraries use. All this allow user to select the most convenient and economical version for solving certain tasks.



Main technical specifications:

- Nominal current: 1.5 A - 8A
- Supply voltage: 220V/ 380V
- 3 analogue inputs, 2 analogue outputs, 6 digital inputs, 3 digital outputs, protective relay
- 2 slots for universal SM enhancement modules
- Built-in braking transistor.

Operation modes:

- Vector control in a closed circuit for servomotors (including linear)
- Output shaft revolutions – up to 40,000 rpm.

Feedback sensors:

- Incremental, frequency, frequency / direction, sinus-cosine, EnDat, Hiperface, SSI, resolver.

Protection:

- From over- and under-voltage, current overload, phase loss.

Adjustment:

- From the built-in or side-mounted control console
- By means of standard CT Soft software via the built-in Modbus RTU

Automatic adjustment modes:

- Without shaft rotation
- With shaft rotation, at low speed and minimal bias (5 electrical degrees)

Extra options:

- Built-in brake resistors
- Multipurpose SM-modules for input/output enhancement
- Multipurpose modules for network protocols connection (CT Net, Ethernet, Profibus, Device Net, Sercos etc.)
- Additional side-mounted panels

CONTROL TECHNIQUES

www.controltechniques.com
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Phone: +7 (495) 981-98-11

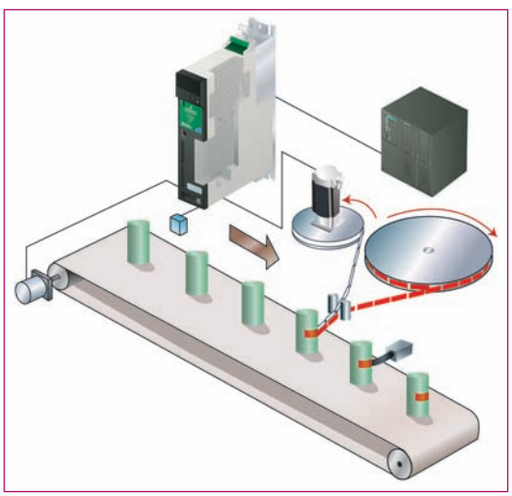

Fig. 1. Labeling

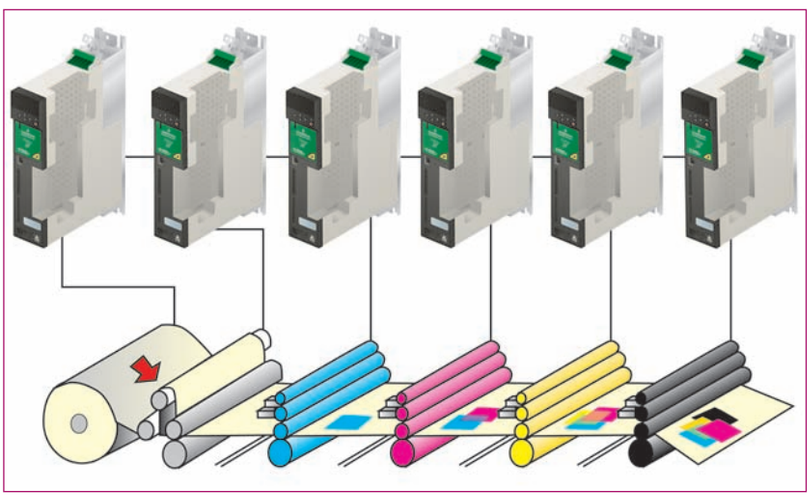

Fig. 2. Offset print

WINTERTHUR
TECHNOLOGY GROUP

Winterthur Technologie AG (Zug) European manufacturers of industrial grinding disks. Rappold-Winterthur group with enterprises in the towns Winterthur and Fillach and SlipNaxos group with large production in Sweden joined their efforts. These three enterprises within combined strategy unified their technologies and competence that finally further promotes increasing operational efficiency for customers' benefit. Winterthur Technologie Group, oriented on production processes, offers innovative and individual processing technologies to all industrial branches in the global scale.

Rappold Schleifmittel Industrie GmbH. In 1999 the largest Swedish grinding disks

Separate group affiliates proudly look back to their past with rich traditions. WST Winterthur Schleiftechnik was established in 1906 in Switzerland. In 1992 after may years of cooperation it united with Austrian manufacturer Rappold Schleifmittel Industrie GmbH. In 1999 the largest Swedish grinding disks manufacturer SlipNaxos AB joined the Group.

The biggest consumers of grinding disks are automotive, bearing, tool and metallurgical industries. The group keeps its works at the highest technical level. Thus all enterprises work is based on international standards not only in production, but also in ecological aspects.

Scientific research aimed at practical requirements is an important aspect of the enterprise philosophy. The Group spends 5% of circulating assets for this purposes. On third of all high-precision grinding wheels was developed in the recent three years. Innovative products designed for a long-term perspective widen Group position on the market and provide a reliable future for it.

Group concentrates its activity mainly in Europe. However via affiliate society Winterthur Corporation it holds dominating niche on the US market and thanks to carefully selected trading representatives keeps successful trading policy in Asia, mainly in China, Japan, Korea, India and Taiwan.

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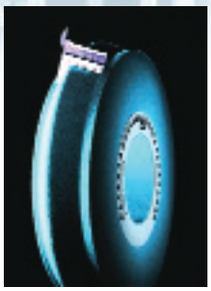

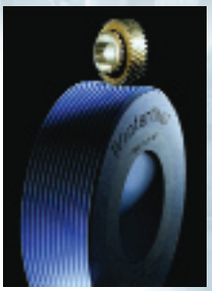

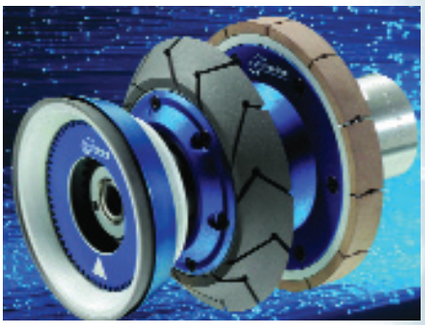

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Mobile phone: +7 (903) 579-50-42
E-mail: info@rappold-winterthur.ru
http://www.rappold-winterthur.ru

RAPPOLD WINTERTHUR

Product mix:

Ceramic based abrasion disks:

- disks for external and internal round grinding
- deep grinding disks
- disks for centerless grinding
- disks for plane and profiled grinding
- teeth grinding disks
- thread-grinding and screw grinding disks
- grinding pins
- grinding segments

Bakelite bond abrasion disks:

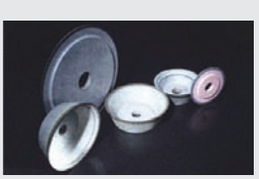
- cutting disks up to 2000 mm diameter
- hot-pressed disks for blooms and slabs grinding
- disks for rolls grinding
- disks for centerless grinding
- roughing grinding disks
- disks for tools grinding
- disks for saw disks sharpening
- cleanup disks

Diamond and CBN disks:

- diamond and CBN disks on bakelite bond
- diamond and CBN disks on ceramic bond with closed and segmented coating
- high-speed CBN disks
- diamond disks for hard-alloy plates sharpening
- disks for camshafts and crankshafts sharpening
- diamond and CBN disks on metallic and galvanic bond

Services:

- grinding technological software
- seminars on grinding process
- grinding technology consulting
- customers support
- grinding process optimization процесса

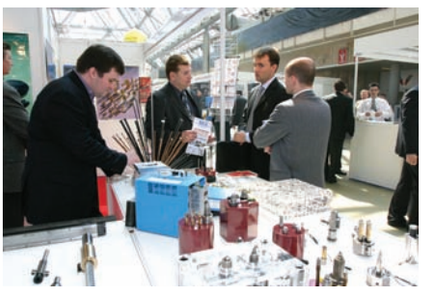


An Impressive Dynamics

ЭКСПОЦЕНТР

The 10th Anniversary International Exhibition of Equipment, Instruments and Tools for Metalworking Industry (METALLOOBRABOTKA' 2008) will take place at the EXPOCENTR Central Exhibition Center in Moscow on May 26-31, 2008.

The exhibition is organized by JSC Expocentr and Russian Association of Machine-tool Producers Stankoinstrument, with the support of Russian Ministry for Industry and Energetics, Russian Chamber of Commerce and Industry, and Moscow Government.



«**Metalloobrabotka**» is one of the largest Russian mechanical engineering exhibitions which is held every even year since 1984. The forum has a considerable effect on the development and modernization of Russian machine-tool production industry. Owing to the high level of exhibition organization, the exhibition was awarded by the awards from the Global Association of the Exhibition Industry (UFI) and Russian Union of Exhibitions and Fairs (RUEF). 93% of the exhibitors consider the exhibition to be the leading event in the industry, while 85% think that it is the best way to present their produce to the concerned audience. The leaders and top experts of the companies make 85% of the visitors, who are interested in establishing partnerships and signing contracts.

«**Metalloobrabotka**» is the world premiere of high technology necessary for the innovative development of Russia. The show presents:

- intelligent machine-tool systems;
- new generation high-technology equipment;
- innovative metal-cutting tools, components and fittings;
- advanced automation systems for engineering industry.

High technological level of the exhibition allows to show large and power-consuming exhibits working in real-time.

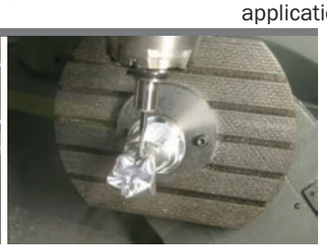
The exhibition area became 5 times larger in the last 12 years, while the number of participants tripled!

In 2006, the exhibition passed the independent audition and established a new growth record!

- Exhibition area (netto) – 25,136 sq. m.
- Number of exhibitors – 720 companies from 28 countries
- Number of visitors – 20,455, including 16,241 specialists (79,4%)
- Number of visits – 41,430, including more than 10,000 by foreign citizens
- 7 national expositions (Germany, Italy, Spain, Slovakia, Czech Republic, Switzerland, Turkey)
- Extensive business program, including the Advanced Russian Metal-working Equipment and Technologies for Russian Machine-tool Industry scientific conference
- New division for Science, Profile Education and Production

«**Metalloobrabotka-2008**» exhibition is under preparation now. The organizers try to make the exhibition help the participants to develop their business.

The best exhibition halls No. 1, 2, 3, 5, 8, Forum with the most advanced exhibition equipment will be provided for the exhibition, while the open areas of **EXPOCENTR** will be perfect for the presentations.



In 2008, the exhibition will include new department – **Equipment, Tools, Materials.**

During the exhibition, the conferences, workshops and new technology presentations will be held. A business center with advanced office equipment, negotiations rooms and recreation area will be provided. A MatchMaking System is included in the exhibition web-site allowing to set up the meetings. **JSC EXPOCENTR** and **LC Expoeffect** invite all the future exhibitors to attend the Efficient Participation in «**Metalloobrabotka' 2008**» workshop free of charge, which helps prepare to the exhibition. An expert from the Expoeffect exhibition consulting agency will recommend the participants how to use the exhibition resources and its unique business potential to their best. The participants will receive a free copy of the How to Earn Profit from Exhibition Participation. 207 Advices to Exhibitors practical guide. Please send your applications for the workshop.

The modernization of Russian machine-tool manufacturing industry cannot be done without introducing new competitive machines ensuring the technological breakthrough in production performance and quality level. By promoting the most advanced technological solutions for Russian machine-tool manufacturers, **Metalloobrabotka** exhibition helps shaping the innovative industry in Russia, making the state-of-the-art technologies available on the market and introducing them into wide spectrum of industrial applications.

JSC «EXPOCENTR», DIRECTION OF EXHIBITION «METALLOOBRABOTKA-2008»
14, Krasnopresnenskaya nab., Moscow, Russia, 123100. Tel: +7 (495) 255-26-60, 255-28-21, Fax: +7 (495) 605-60-55,
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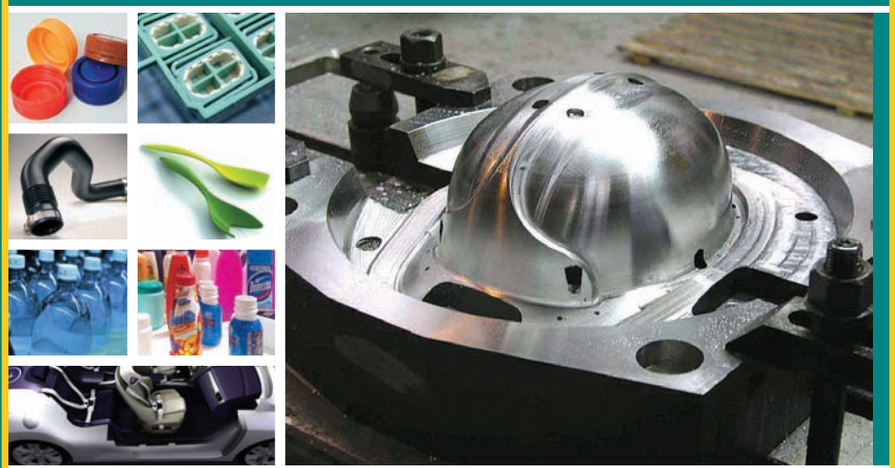
International specialized exhibition

«Moulds. Die moulds. Stamps»

RosMould

Russia, Moscow
exhibition center
«Crocus Expo»

June 17 – 19, 2008



Main focus areas of the exhibition:

- Production styling and design
- Modeling, prototyping,
- CAD/CAM/CAE/PDM software products
- Moulds and die moulds production
- Stamps production
- Metals, alloys, composites
- Metal processing equipment
- Cutting and measuring tools
- Special forming rig
- Periferal rig, robots etc.
- Automation and quality control equipment
- Normalized components, parts and units
- Innovative developments and projects

An important event for the industry –

«International Tools Summit»

– will be held during the exhibition

Informational support:

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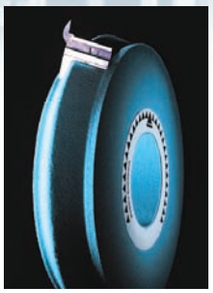

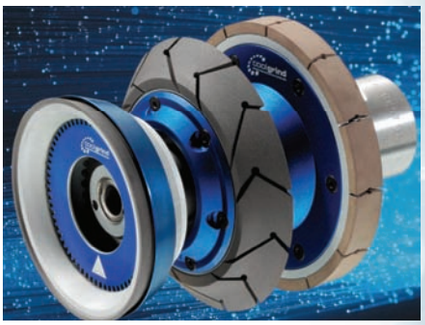

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http://www.rappold-winterthur.ru

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- disks for tools grinding
- disks for saw disks sharpening
- cleanup disks

Diamond and CBN disks:

- diamond and CBN disks on bakelite bond
- diamond and CBN disks on ceramic bond with closed and segmented coating
- high-speed CBN disks
- diamond disks for hard-alloy plates sharpening
- disks for camshafts and crankshafts sharpening
- diamond and CBN disks on metallic and galvanic bond

Services:

- grinding technological software
- seminars on grinding process
- grinding technology consulting
- customers support
- grinding process optimization процесса

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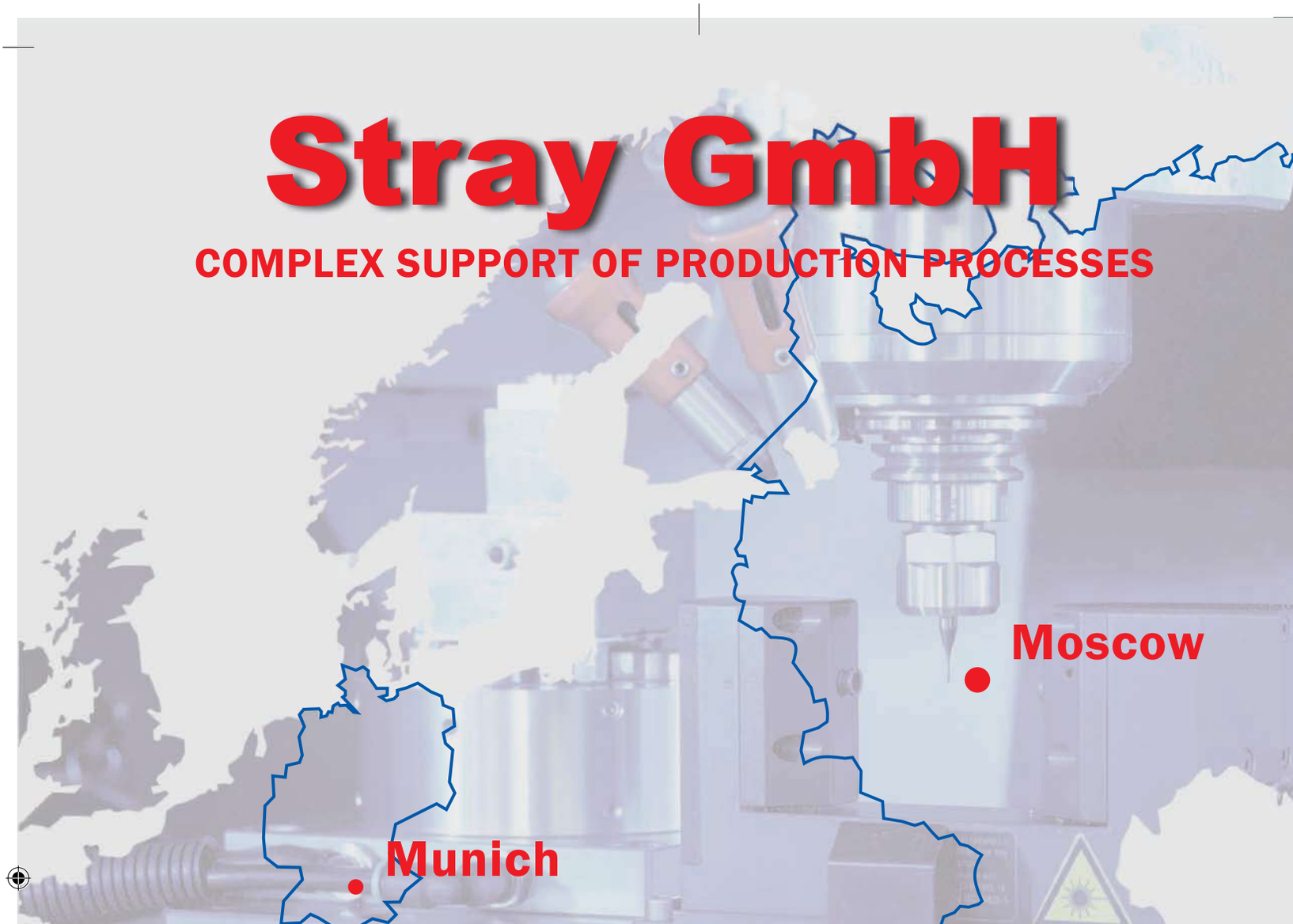

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