DIADISC 4100
4200 (R)

Precision Laboratory and Specimen Cutting-path

Cutting height
0-14 mm

Mutronic®

CONTENTS

Note:

Brochures and other information publications sometimes need updating, supplementing and correction after only a very short time, thanks to constant advances in the pace of new and further developments of products and machine options.

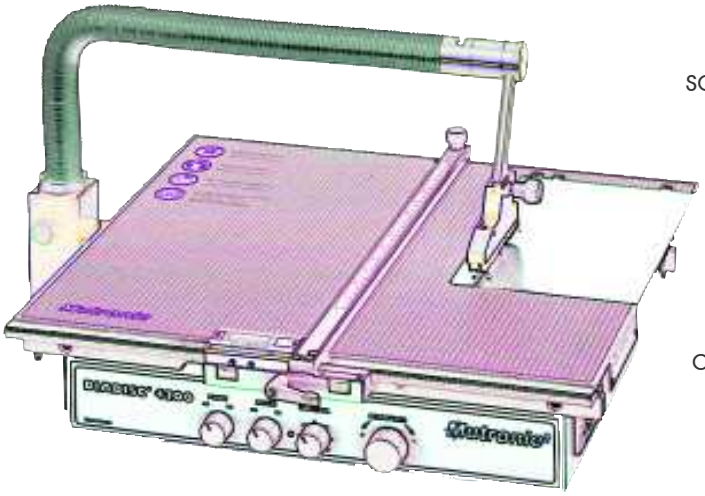
We have therefore decided to print most of our brochures ourselves. This enables us to provide speedy and constantly updated issues of requested information. We would, however, ask you to forgive the difference in printing quality when compared to high-gloss offset printing methods. You can also avail of information with high-resolution illustrations in the internet.

The machines illustrated in the pages of this brochure are mainly depicted with optional expansions. The price list contains further details relating to accessories and optional equipment. Please contact us if you feel you need further clarification. The illustrations of machines, options and accessories may deviate from the colour, shape and design, both technical and constructional, of the delivered goods.

You can find information on other *Mutronic* products (along with information on trade exhibitions) in the internet under: www.mutronic.de

SAWING · CUTTING · MILLING · DEBURRING

Cuts all materials with precision



High-precision DIADISC bearing assembly ensures a perfect cut.

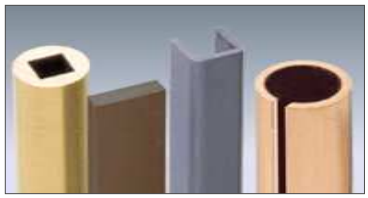
The high concentricity of the drive elements and the use of special saw blades means that hardly any burring occurs during machining. The cutting quality reaches peak-and-valley values of RZ 4-6.
This is smoother than fine milling!
In other words:
reworking of the cut surface is no longer necessary in many cases!
This saves valuable working time.

The variety of optional equipment which is available enable the DIADISC concept to be rapidly adapted to the respective application. The most important optional equipment is described hereafter in detail.
Compact dimensions enable it to be used in every workplace, even in confined areas such as laboratories and workshops.

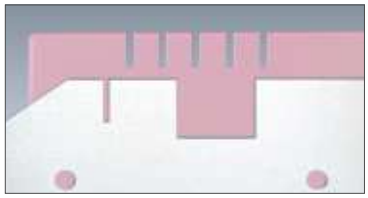
Cutting out test samples with high precision

Cutting V-grooves with defined angles in test samples

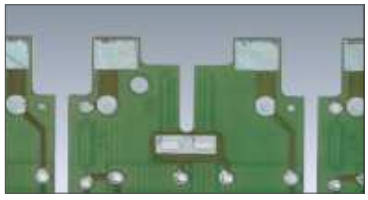
Cutting tubes, profiles and bars to length and slotting etc.



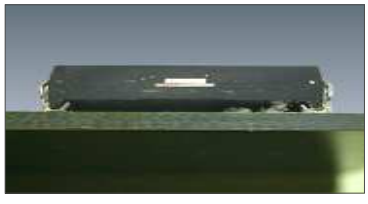
Cutting out, notching and deburring metal and plastic plates



Cutting, milling, chamfering and scribing of PCB's



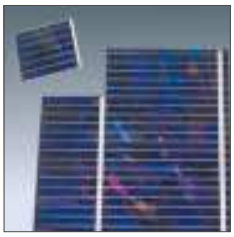
Quality assurance test cutting with electronic and mechanical components



MACHINING EXAMPLES

In addition to test sample machining, *DIADISC* cut-off saws can be used for a variety of other machining tasks. They can cut all materials and material combinations successfully, achieving an extremely smooth cutting surface which is practically free of burrs.

Examples from customer applications and the options described on the following pages give information to the versatility of the *DIADISC* cut-off saw.

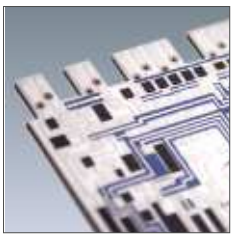


Machining Si-solar elements with a cut width of 0.2 mm.

Opening a high-grade hybrid module for repair purposes.

Machining components made of ferrite, porce-lain, glass, fired and "green" ceramic.

Notching predetermined breaking lines on panel prin-ted circuit bo-ards made of Al203 ceramic



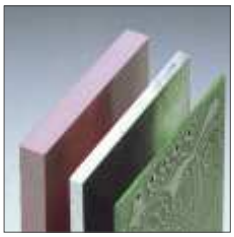
Working labo-ratory samples made of hybrid ceramic by sawing, grooving and notching.

Extremely smooth QS cut through a HF-transformer for the loca-lisation of a winding error.

Fabrication of contact elements. Cut width of 0.2 mm, thus no pole loss.

Composite material consisting of bonded layers of different material.

Cutting hard steel, tough spring steel, hardened or coated steel parts.



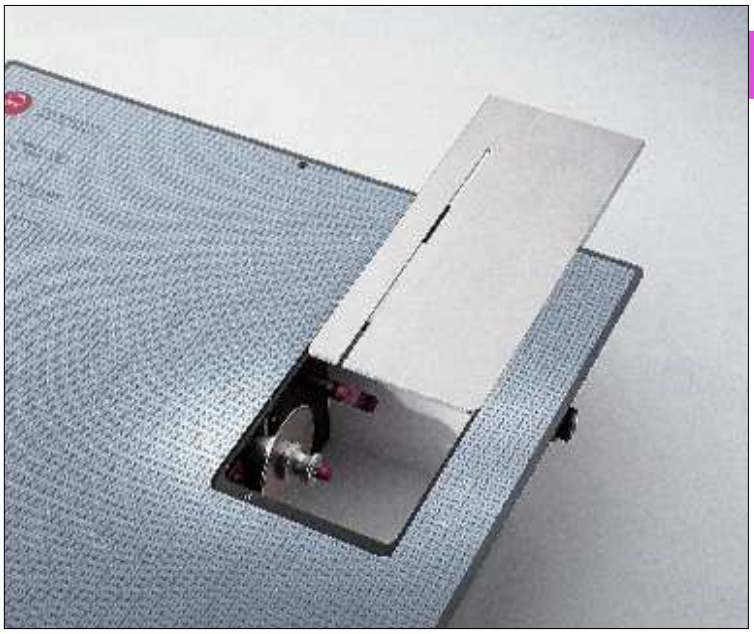
Sawing boards to measure made of plastic or fibre-reinforced materials such as glass-fibre reinforced pla-stic, carbon-fibre reinforced and metals.

Smooth sawing of Acrylic rods and plates or other transpa-rent plastic material.

Cutting a V2A double pipe with fibre optic light guides for the endoscopy.

We develop customised solutions for sawing or separating special materials.
Please tell us your needs.

TABLE TOPS



Different requirements- different possibilities

Rigid plastic table top (without illustration)
only for DIADISC 4100/4200
An inexpensive design for the processing of printed circuit boards and synthetic materials. A recommendable acquisition for the occasional manufacture of prototypes.
Not suitable for the processing of metals and brittle materials.

Rigid aluminium table top (without illustration)
only for DIADISC 4100/4200
A special aluminium alloy lends high strength for the processing of many materials. Thanks to the removable steel insert at the saw notch, wider cutting tools for the manufacture of special designs can be attached. The saw blade can be exchanged in next to no time by removing the table top.

Precision slide table in cast aluminium
Fitted with prism roller guides for absolute backlash-free movement and location bore holes for options relating to test sample manufacture.
This slide tables are also suitable for machining parts made of delicate materials such as ceramic, glass, ferrite and PCB processing.
The table top must not be removed to change the saw blade, as the steel insert can be pushed to the rear.
Various slide paths can be supplied - see pricelist and „technical data" for more detailed information.

Electronically controlled cut
You start the table advance with the foot pedal and you separate your materials at a continuous speed. You can continuously adjust the characteristics of advance from hard for metals and soft for glass and ceramics, etc. You attain higher precision because your advance parameters can be adjusted exactly to the material processed.
This gives you a homogeneous and clean cut.

MATERIAL STOPS

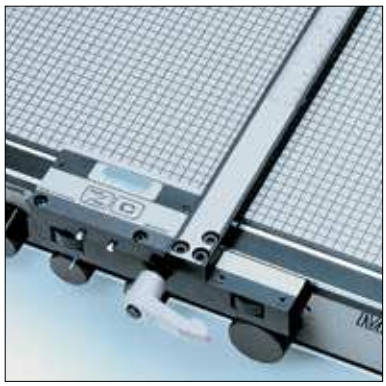
for precision working

Parallel stop for single applications

The stop can be moved into the desired position and stopped there on a ground shaft made of VA.

Parallel stop with tape measure system

This stop has a larger guide carraige and an additional fine adjustment feature. The dimension can be read and fixed on the mm scale.

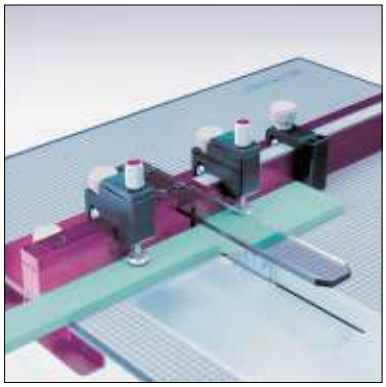


Parallel stop with digital precision

For the highest exactitude and particularly quick adjustments. The LCD digital measuring system displays the set dimension exactly in mm or inch.

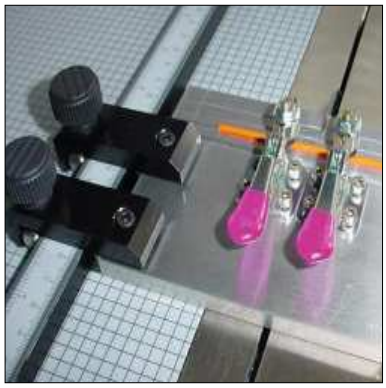
Lateral stop A „Standard"

Used in combination with a slide table of any desired size, long parts such as pipes, profiles and plates etc. can be set to the correct length in the right angle.



Lateral stop B "Professional"

As the standard lateral stop, however with a measuring tape, adjustable stop and clamping rail. Elastic clamping pieces (as optional equipment) hold sensitive material reliably.

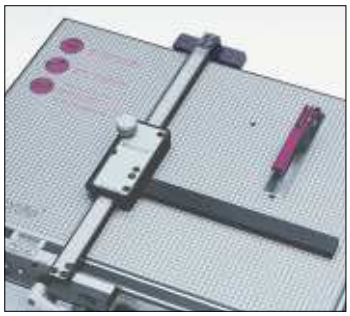


Limit stop for small parts .

Small parts (stainless steel tubes, light wave guides) can be fixed precisely in the right angle and cutted rational in combination with sliding tables and parallel stop.

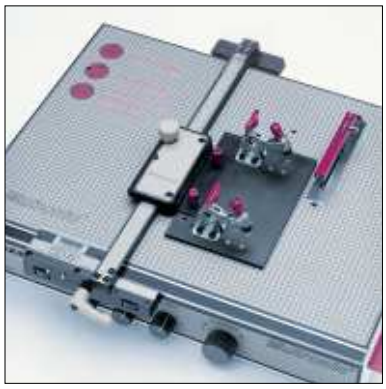
Price information on separate list

FEED APPLIANCES

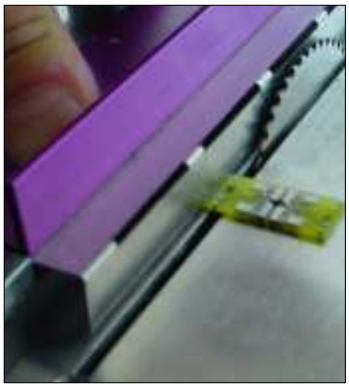


The feed appliances (with ball bearing guides) serve to position the work-piece exactly and convey it to the saw blade. Thus pipes, rods, profiles etc. can be set to the correct length, parallel or slanted, with great exactness.

A variety of adapter plates are provided to hold differently shaped workpieces. The quick-clamp securing clips or your own fixtures can be mounted on these.



CLAMPING DEVICE



You can use the retention device to precisely fix small components at right angles and efficiently cut them to lengths in combination with any size sliding tables and one of the parallel stops.

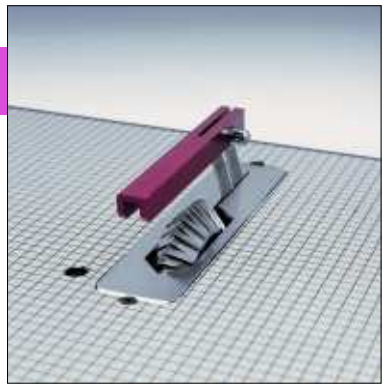
Beyond this, this device offers you protection from injuries when narrow parts are separated that are difficult to hang onto.

GROOVE-CUTTING/DEBURRING DEVICE

FOR EFFICIENT DEBURRING

of PCB's, aluminium and plastic.
A special blade is drawn along the workpiece, milling a a clean bevel free of chatter. The width of the bevel can be infinitely adjusted.

This device also enables so-called "printed plug contacts" on PCB's to be bevelled on one or two sides:
the copper paths remain unaffected by this operation.

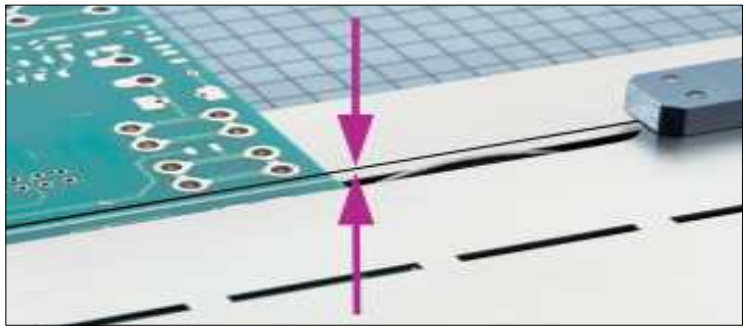


BENDING AND NOTCHED GROOVES

For the production of housings made of PVC, plexiglass etc. This enables 90° camfered grooves to be produced effortlessly and with infinitely adjustable depth (photo on left).

SIGHTING DEVICE

This optional device serves to render the intended cutting line visible if grooves or notches are to be sawed in the material from below. The part can be set up exactly and secured at the same time.



USEFUL ACCESSORIES

Disk grinding device

Helpful and practical!
An optional disk grinding device on the right-hand machine side enables work to be carried out subsequent to sawing, such as deburring, circular grinding, chamfering, etc. Even blunt drills can be sharpened.
Suitable grinding disks with Velcro fasteners are available with different grit sizes.

Pedal switch

If the saw blade is blocked, both hands are required to guide the material.
The pedal switch enables the machine to be switched off in this situation in a fraction of a second.

Machine-cabinet

Compact and mobile
Tool cabinet made of solid steel with four pivoting rollers, specially designed for DIADISC cut-off saws. The cabinet can hold the machine with all required accessory parts, thanks to its high load-bearing capacity.

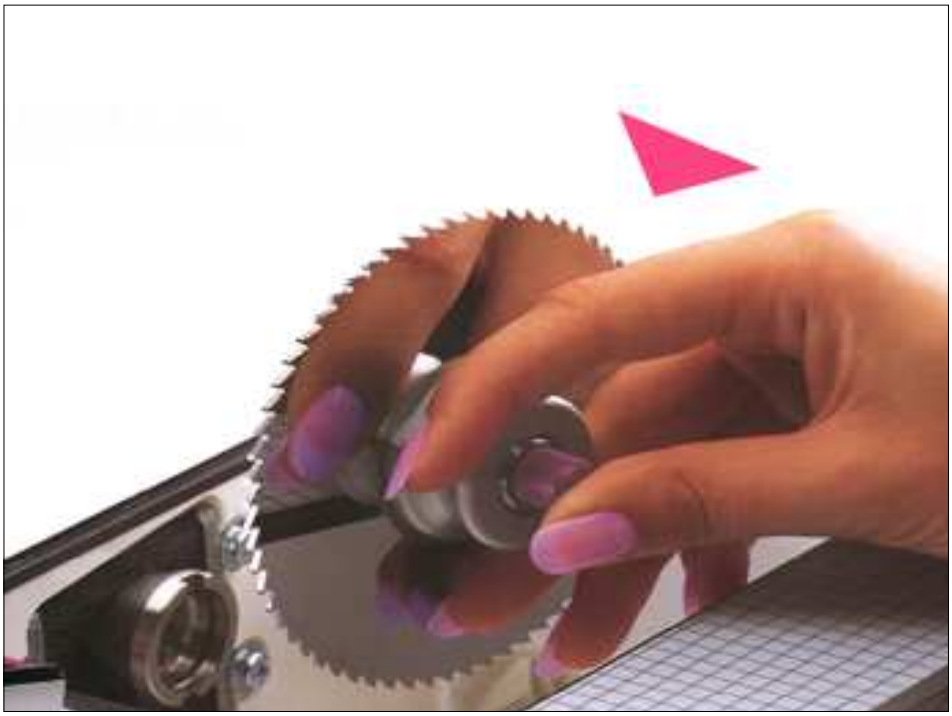
Protective equipment

Protect youself at all times!
The pivoting splash guard is shatter-proof and protects against swirling dust particles, chips and spraymist of the coolant system. The parts are fed with the aid of a sliding rod, leaving hands and fingers outside the danger zone at all times. Protective glasses offer additional safety.

Price information on separate list

TOOLJET
Quick-change -system

Saw blades or cutting disks can be changed in seconds at the touch of a button



Clearly positioned in the holding station (accessories) to suit application, material or saw blade thickness.

For universal circular saw applications (i.e. if frequent changing of cutting tools is necessary due to the different materials involved) is the rapid replacement a decisive advantage.
The slim breaking fragility of cutting tools is compensated for and there is no need to use wrenches.
Saw blades and cutting disks are simply replaced at the touch of a button.

By the way: Both old and new *DIADISC*-machines can be fitted with Tooljet.

Price information on separate list

MICRO SPRAYING EQUIPMENT

Smooth cuts and improved cutting performance

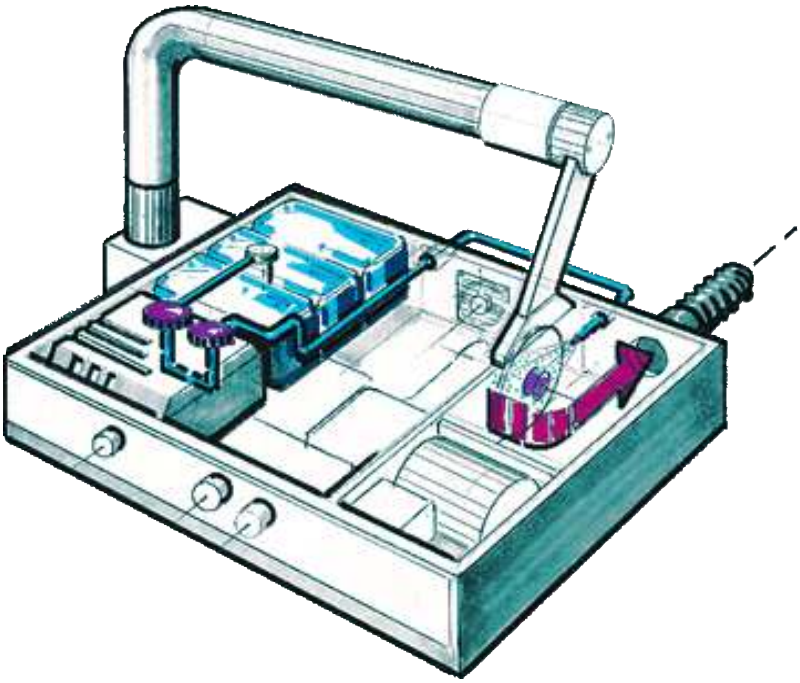
Wet cutting with the micro spraying equipment is a supposition for the highest cut quality.

The spray mist ensures perfect lubrication every time, something which cannot be achieved manually with a brush.
The cooling required for diamond cutting disks is thus achieved when machining hard, brittle materials.
The cutting result can be improved by up to 100% by using the micro spraying equipment.
Cutting surfaces with a peak to valley height of RZ 4-6 μm can thus be reached.

Lubrication is essential when machining the following materials: aluminium, brass, copper, steel and all other hard metals.

Cooling is necessary with the following materials: glass, ceramic, ferrite, graphite, silicium and all other brittle materials.

Water can be used for cooling, or a special emulsion for lubrication, depending on requirements (see price list "Accessories").

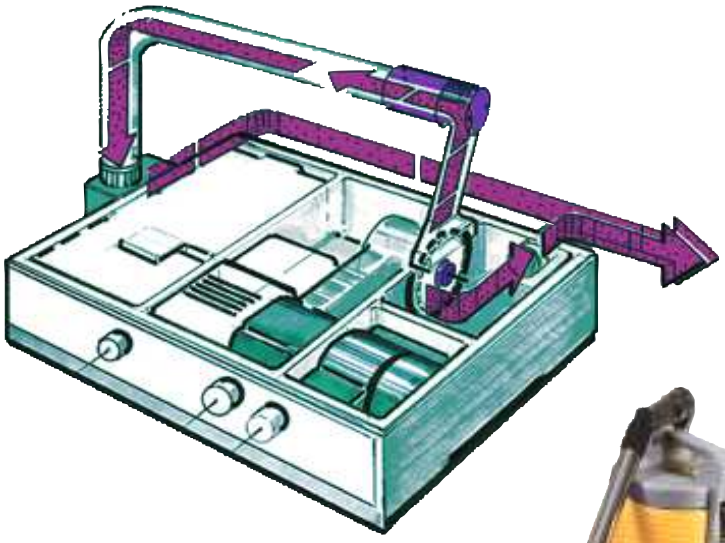


The micro-fine spray mist adheres securely to the saw blade, even at high speed.

The spraying liquid is filled through the filling connection at the rear.

DIAVAC-EXTRACTION

Benefits both your health and the environment



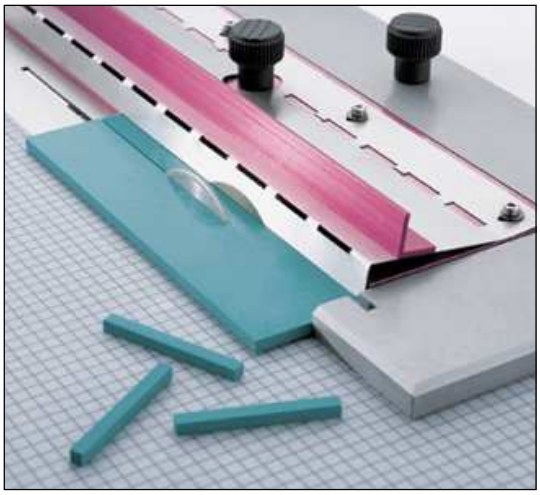
Materials which produce fine or health-endangering dust should always be machined in conjunction with the use of an extraction unit. This particularly applies to machining of fibre-strengthened materials (PCB's, fibre-strengthened plastics etc.)

Using *DIAVAC* extraction units prevents fine dust particles being blown out into the atmosphere. Not every extraction unit is suited to this task. The *DIAVAC* extraction units are equipped with a special fine dust filter and thus guarantee optimum results. A socket is provided for connecting the unit.

Chips and dust particles are taken up and transported away by the air current of the extraction unit. This is made possible because the suction arm is equipped with an efficient air conveyance system and a suction head with special sealing bristles. The bristeles are arranged round about, sloping backwards, and enable the workpiece to be sensitively pushed through without slowing or stopping.

The front part of the suction head can be tilted upwards to enable the saw blade to be viewed during set-up. The suction head can be continously adjusted with a knop to suit the height of the workpiece. This option offers a high degree of user-comfort, as it can be pivoted upwards or removed completely if necessary when changing the saw blade.

STANDARD TEST SAMPLE CONFORMING FOR DIADISC 4200R



Advantages:

A precise, smooth cut with limited burring, much better than that prescribed by standards.

Special saw blades, V and U groove milling cutters of all standards are available as accessories.

Special lubrication systems ensure a smooth cut is achieved without heating the material.

Low space requirements (laboratory table) and good mobility, thanks to the low weight (15 kg).

The machine *DIADISC 42OOR* is based on the standard *DIADISC 42OO* model having the same technical specifications relating to precision and performance, but with a special table top in which locating holes are provided for holding various optional extras.
The table top slide path can be selected from three sizes.

The equipment with the „Gear Reduction" optional extra is recommended in addition for the production of test pieces. This allows a wide spectrum of speeds whereby all types of materials can be processed with optimum cutting quality.

The „Microspraying equipment" is absolutely necessary as an optional extra for reducing the formation of burr.

The newly developed „Freezing Air Cooling Unit" option additionally improves results, particularly when processing PP, PE, PA, PTFE etc.
Using normal compressed air, this creates a supply of -10°C cold air and thereby ensures highly efficient cooling for the saw blade or cutting-off wheel.

The machine can be operated with one or both cooling systems, depending on requirements.

Notch depth adjustment

The cutting depth of the notch milling cutter on the *DIADISC*-separating saw has to be set very precisely in order to get precise measurements.

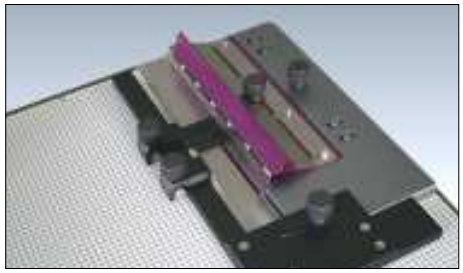
The *Mutronic*-notch depth adjusting equipment allows you to make this setting fast and easily.

Price information on separate list

CUTJET test sample saw fixture for DIADISC 4200R

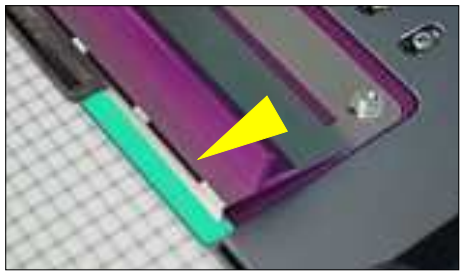
1. CUTJET test sample saw fixture

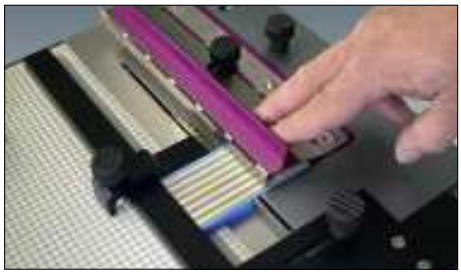
consists of a template holder (grey) which is secured to the slide table as a base. It forms the basis of the holder for type B templates and the mounting of the optional "chamfer fixture" (black) with its type L (violett) inter-changeable templates.

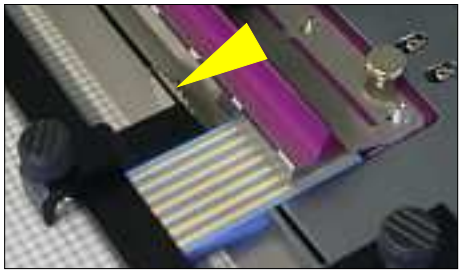


You can set the desired test sample width (the distance from the saw blade to the limit stop) in seconds with the use of **inter-changeable templates B** (violet). Templates can be supplied for all standard and special widths (see price list).

Long and/or narrow samples can be secured with the integrated holding down device (arrow) and machined without risk.
The test sample saw fixture is also ideally suited for all normal sawing operations involving heavy parts which are difficult to fix.







2. CUTJET test sample notching device

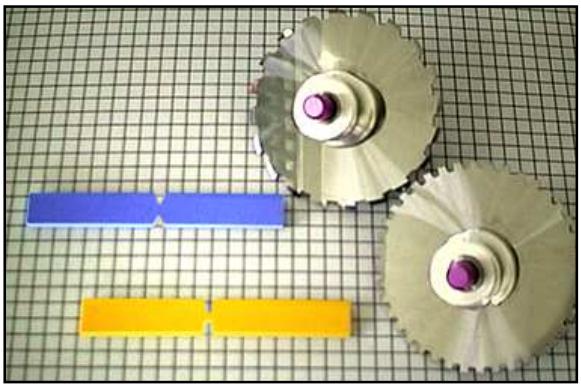
It serves in combination with the "test sample saw fixture" for the machining of V and U notches and consists of longitudinal limit stop and two limiting slides (black). A different **interchangeable template L** (violet) is required for every desired length of test sample.
Test samples which are cut to size can now be notched. This entails the use of special profiled cutters (arrow) which are supplied in compliance with standards.
The groove depth and the speed can be continuously varied at the touch of a button on the *DIADISC* cut-off saw.

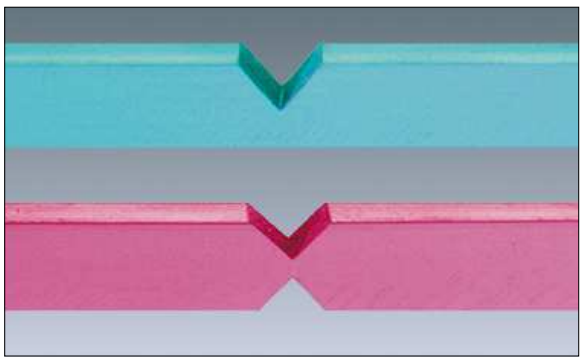
The option "notching device" is also suitable for cutting test samples rationaly and other parts to a predetermined length. The desired length is achieved by using a suitable inter-changeable template L (violet). A clamping bar (arrow) secures the part to be sawed.

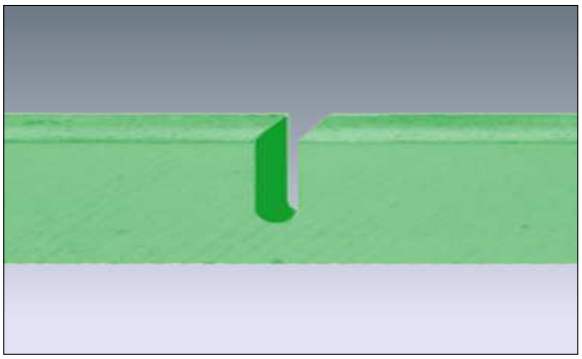
TEST SAMPLE CUTTING TOOLS

V- and U-notch machining

Shearing resistance	DIN 65 148
Notched bar test (Charpy)	DIN 53448, 53753, ISO 179, 180 ASTM D 5941, D 256 ASTM D 5942
Notched bar test (Dynstat)	BSI 2782-350/359 DIN 53453, 53435 - ISO 8256 - UNI 6062







So that the demands made on accuracy, shape and service life of the cutting edges are achieved, VHM saw and profiled cutting blades for QS and test sample applications are very costly to produce and grind.
Furthermore, the teeth of profiled cutters are logarithmically relief ground so that they can be repeatedly re-ground at a later date. For this reason this category of tools is substantially more expensive than comparable standard types.

To achieve to a great extent freedom from burr, the ideal settings for speed and feed have to be found by experiment. These values depend on many factors, so it is not possible to give any standard values here. Normally, a few trial cuts are sufficient.

If plastics with a filling, such as glass or carbon fibres, have to be processed, we recommend that you first contact our laboratory.

If required we make test cuts for you in order then to develop particular cutting geometries with which you can achieve the best cutting qualities.

Price information on separate list

SUGGESTED EQUIPMENT DIADISC 4200R

Cut-off saw and necessary optional equipment:

DIADISC cut-off saws are sold for a broad variety of applications. This flexibility is achieved by the varied optional equipment available for a basic appliance [1)], each of which has been developed to solve a particular sawing problem.

The following list of equipment for the saw used in "test sample production" applications will give you an overview and/or facilitate the selection of the right optional equipment.

SAW MACHINE DIADISC 42OOR basic appliance	Item-No.: 00.00030
Auxiliary ventilator, for increased operating periods (ED)	Item-No.: 10.04120
CUTJET-Template Holder, (without interchangeable template)	Item-No.: 10.07680
Interchangeable template-B, (state test bar **width** in .. mm)	Item-No.: 10.07930
CUTJET-Option: Notching device, (without interchangeable template)	Item-No.: 10.09710
Interchangeable template-L, (state test bar **length** in .. mm)	Item-No.: 10.10500
TOOLJET saw blade quick-change system,	Item-No.: 10.05510
TOOLJET interchangeable holder, single (1 interchangeable holder is required for each individual cutting tool)	Item-No.: 10.05540

optional, depending on the maximum length of the test sample and/or the size of the format being machined:

Table top D, Aluminium sliding table, 160 mm	Item-No.: 10.08260
Parallel stop, digital for table top D,	Item-No.: 10.12730
or	
Table top E, Aluminium sliding table, 250 mm	Item-No.: 10.04080
Parallel stop, digital for table top E,	Item-No.: 10.12740
Drive belt fixed gear reduction 2:1	Item-No.: 10.08510
Micro- Spraying-Equipment	Item-No.: 10.00480
or	
Freezing air Cooling Unit	Item-No.: 10.08920
Pedal switch	Item-No.: 10.00120
DIAVAC 8OO, Extraction	Item-No.: 00.08190
Suction arm B,	Item-No.: 10.07540
o r	
Suction arm C,	Item No.: 10.09210
Automatic switch-on device,	Item-No.: 88.00272
Dust bag, (1 packet of 20)	Item-No.: 88.03013

Cutting tools and notch depth adjustment as required!

TECHNICAL DATA

Machine:	*DIADISC 41OO*	*DIADISC 42OO(R)*
Cutting height [1]:	0- 14 / 12 mm, cont. variable	0 - 14 / 12 mm, cont. variable
Speed:	2000 - 9000 min-1	2000 - 14000 min-1(*R)
Tool:	Ø 63 mm	Ø 63 mm
Power input/Power output:	max. 300 Watts / 50 Watts	max. 600 Watts / 180 Watts
Oper.mode [2]:	S6, 60% OD	S6, 60% OD
Control process:	half-wave control	full-wave control
Special characteristics:	-	torque cutoff
Overload protection:	thermal	thermal, electrical
Restarting protection:	yes / relay	yes / relay
Drive:	V-belt	double V-belt
Noise level:	72/78 dB(A) idling/sawing	72/78 dB(A) idling/sawing
Dimensions: [3]	475x576 mm (725x650 mm)	475x576 mm (725x650 mm)
Weight:	ca. 15 kg (18kg)	ca. 15,5 kg (18,5 kg)
Fuse protection:	not EX protection!	not EX protection!
Working temperature:	+15° to 25° C	+15° to 25° C
Area-humidity:	30% to 50%	30% to 50%

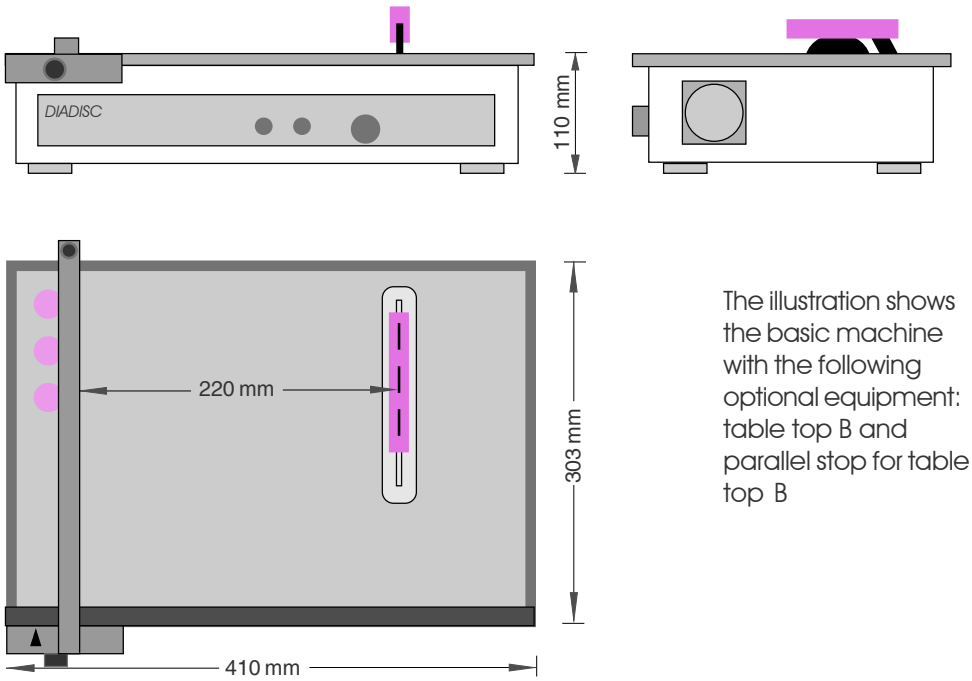
1) If the machine are fitted with sliding-tables the max. cutting height will be reduced about 2 mm.
2) S6=uninterrupted periodic operation with intermittent loading, ON duration (OD) in percent relative to 10 min cycle duration
3) Machine dimensions, equipped with maximum table top size (*R) Drive belt fixed gear reduction 2:1, for processing plastics such as PC, PP, PE, PMMA etc. less frictional heat is produced as a result of the low speed

Bearing assembly: Precision instrument ball bearing x 2, stainless steel ("corrosion-free")

Application: Cut-off saw for test sample production, as for lab cutting of plastics, non-ferrous metals, steel, glass, ceramic etc. and PCB's made from laminated paper and fibreglass (FR4)

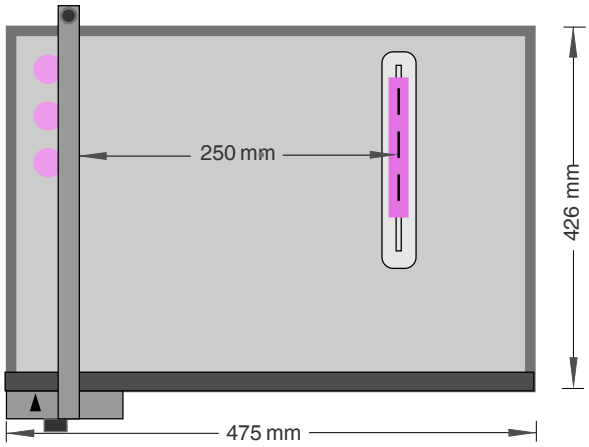
Area of application: Laboratory, workshop, production. Only be used in a dry environment.

Tools: HSS-and solid hard metal saw blades, diamond cutting disks, corundum cutting disks and special tools.

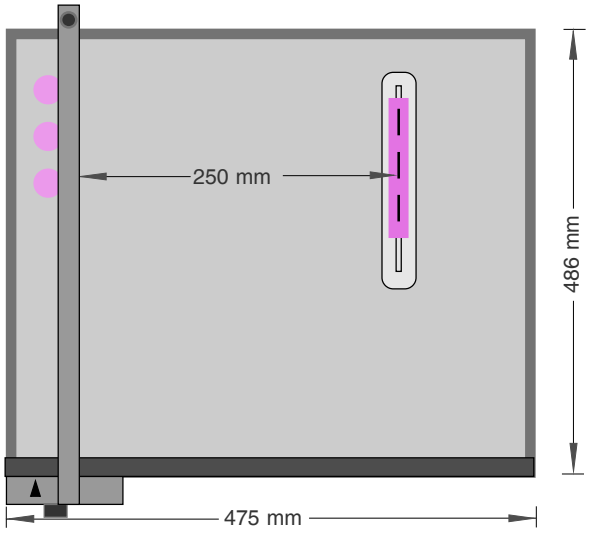


The illustration shows the basic machine with the following optional equipment: table top B and parallel stop for table top B

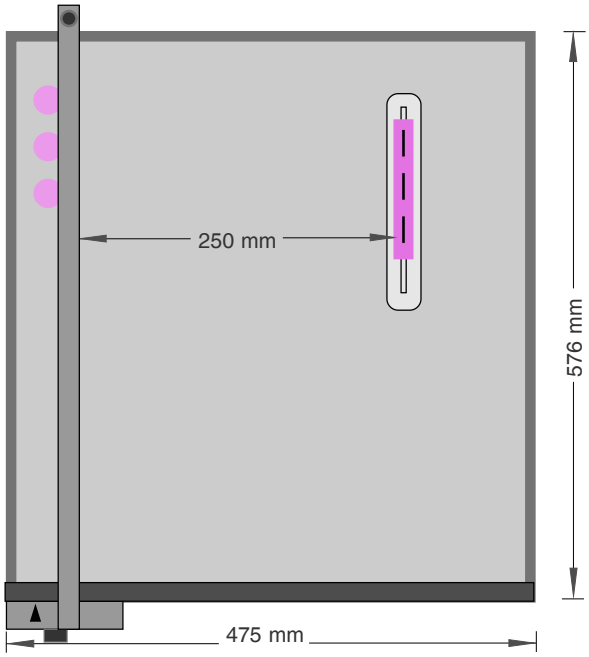
TECHNICAL DATA



The illustration shows the basic machine with the following optional equipment: table top C and parallel stop for table top C



The illustration shows the basic machine with the following optional equipment: table top D and parallel stop for table top D



The illustration shows the basic machine with the following optional equipment: table top E and parallel stop for table top E

TECHNICAL CHARACTERISTICS

Saw blades:

In order to achieve the highest quality in cutting edge or freedom from burr when cutting, it is necessary to use the special purpose saw blades appropriate for the particular plastic. Equipping the machine with the TOOLJET quick-change system has proved itself for this.
Here you exchange the saw blade within 8 seconds without having to use an additional tool.
This system allows the operating process run smoother and additionally protects the expensive VHM tools against the damage which can always be caused when, for example, getting busy with a spanner on a conventional saw blade holder.

Handling:

When ordering the *DIADISC 42OOR* with the "*CUTJET* Test Sample Saw fixture" from us, it is delivered mounted on the table top and ready for operation (the fixture can of course be re-moved again if necessary, for sawing other workpieces).

An appropriate interchangeable template is inserted in the test sample template holder for the actual sawing process.
If for example, a test piece is to be produced having a width of 8 mm, the corresponding interchangeable template for this is inserted. This allows a clearance of 8 mm between the saw blade and the locating face.
The test sample widths required must be quoted when ordering the unit. Thus, if you require in practice 3 different test sample widths, you have to order three corresponding interchangeable templates.

The advantage of this system lies in the quick change to widths to be sawn without having the bother of altering the stops. Even after removing the complete feeding equipment, the dimensions always remain on returning. Precise holes are provided in the table top for this purpose, into which the feed equipment alignment pins can engage.

Assembling:

The complete *CUTJET* option is mounted on the table top, to the right of the saw blade, with knurled screws.

This means that sufficient room remains free to the left of the saw blade to attach a parallel stop in order to be able to cut sheet material roughly to size or to produce other precise cuts.

Cooling:

The micro spraying equipment or freezing air cooling mentioned, cools the saw blade with a micro fine water mist or cold air, in order to reduce the formation of burr to a minimum.
The micro spray mist can be switched on and off with a switch. The consumption of water per hour is only about 100 ml.
Moistening the rotating saw blade takes place underneath the table top so that in the working area, that is on the table top, no nuisance is caused by the spray mist. A portion of the amount of water evaporates from the saw blade, the other part containing sawdust is removed by the extraction unit and the suction arm.

We supply special purpose saw blades for processing certain types of plastics, e.g. types of plastics with fillers, if you cannot see a suitable one in the *DIATOOL 63* leaflet.
In this case please send a sample of the particular material to our laboratory (filling materials are e.g. glass fibre, chalk, quartz powder etc.).

Cutting times:

Cutting times from 10 to 50 mm/sec. are reached as a result of the high speed of the drive motor. These values can also vary depending on the thickness and characteristics of the material.

TECHNICAL QUALITIES

Drive mechanism and safety

DIADISC precision machines are equipped with special high-speed balanced motors to maintain an universal and broad speed range as possible. An electronic speed regulator controls the motor spindle.
The respective load is determined and additional output is readied automatically if necessary.
The speed can be steplessly adjusted throughout the entire range. It is characteristic of the speed that it does not remain entirely constant when the motor is under load, but rather adapts itself accordingly in critical situations.
The tendency of drills and milling hobs to block (along with the possibility of tool fracture as a result) is thus considerably reduced.■

Material and quality

The construction and assembly elements used (milled and turned parts, ball bearings, etc.) are made exclusively of high-quality materials, such as non-corrosive stainless steel, special anodised aluminium or brass.
Particularly important construction parts, such as chassis, bearing seats, pulleys and drive shafts are made of solid raw material turned, milled and ground on precision CNC machines.

Punched and bent parts are not used, due to their tolerance and stability characteristics.
Parts from other suppliers, such as motors, control electronics and bearings, are produced exclusively in Germany, Austria and Switzerland in accordance with our production and quality stipulations.
This ensures a long-term guarantee of both precision and the supply of spare parts.■

Development and production

All *DIADISC* machines are developed in our production facilities and brought to their final technical maturity under the direction of engineers and experienced technicians.
The machines are designed for lengthy periods of application, constructed with suitable stability and comply with currently valid standards.
Newly developed options are so designed as to be also suitable in most cases for retrofitting older serial models.
Machines and options are thus useful long-term investments.

The entire final production and quality control is carried out at our works in Rieden.■

Further options and detailed information are contained in the separate price list. Please make enquiries in advance with regard to prices in the event of placing an order, as these can be subject to change.

Mutronic®

Precision for laboratoy and production

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