

# MAPS



**Fully automatic,  
computer-controlled  
preparation system**



- **Tailor-made solution**
- **High volume preparation**
- **Excellent preparation quality**
- **Outstanding reproducibility**
- **Considerable savings in manpower and consumables**
- **Very easy operation**

MAPS is the ultimate solution for automatic preparation of metallographic specimens. A modular system which is tailored exactly to the user's specific requirements. MAPS takes care of the entire preparation process - from plane grinding to final cleaning and drying. Preparation quality is excellent, and due to exact control of preparation processes and consumption of abrasives and lubricants, the reproducibility is second to none. Another consequence of controlled preparation

is considerable savings in preparation costs.

Modularity means flexibility. MAPS fits into a medium-sized lab, and it is an obvious choice for high capacity preparation. Whatever the requirements are, a MAPS system can be designed to meet the needs.



# Modular Automatic Preparation Systems = MAPS

## A Preparation Sequence - Step by step

MAPS consists of modules, each with two work stations, one cleaning station and a specimen holder arm. Accessories such as dosers, recirculation, hot-air dryers, level indicators for consumables, etc. differ according to the configuration of each MAPS system. Conveyers transport the specimen holders from unit to unit. Suspensions and lubricants are stored in easily accessible modules. Up to three modules can be connected to a preparation station, each module containing two suspension bottles and one lubricant bottle. Alternatively, an oxide polishing module for two oxide suspensions may be added.

### More than 30 combinations

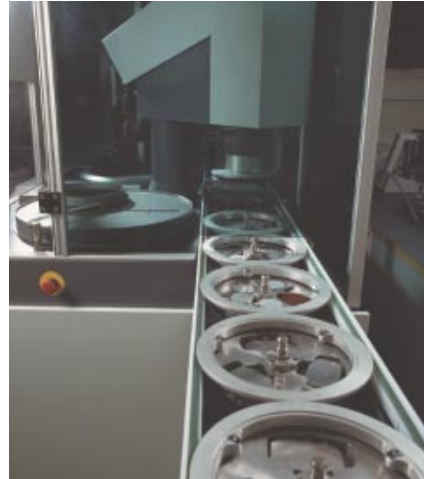
The MAPS modules can be configured in at least 32 different ways, depending on the requirements. This is the consequence of modularity taken to its logical extreme: each MAPS system is configured on the basis of a thorough analysis of the user's specific needs. However, a MAPS system can at any time be expanded by addition of one or more modules, if the need for larger capacity arises.

### Very high efficiency

A steady flow of specimen holders can pass through MAPS. When one module takes care of polishing, another is busy plane grinding the next batch of specimens. A special queue function makes it possible to prepare different materials according to different preparation methods – fully automatically. The queue function ensures an extremely fast throughput and eliminates all bottleneck problems, even at high volume preparation.



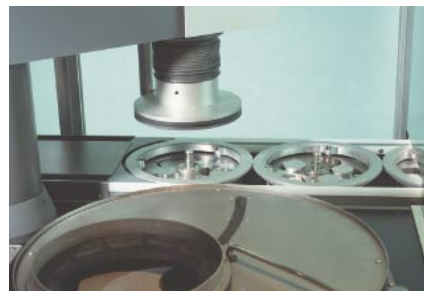
When MAPS controlled modules, 30 preparations are available, 10 predefined and 20 user-methods



1. Six specimen holders queue up in the conveyer leading into MAPS



5. When the grinding is completed, the specimen holder is carried to the cleaning chamber



2. Specimen holders are fed into the first position - plane grinding - by conveyer belt



6. After fine grinding the specimen holder moves on to polishing



3. The specimen holders are collected from the conveyer belt, using a special lifting device



7. The finished specimen holder is moved to the conveyer belt, where it can be collected by the metallographer for microscopic examination



4. Grinding is now in operation. The next specimen holders are ready for collection

# Reduce preparation costs

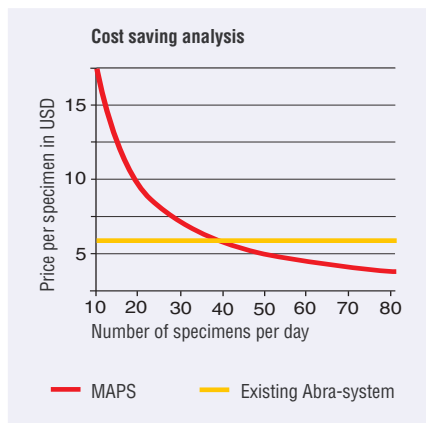
## More time for demanding work

MAPS takes care of the entire preparation process, even when it comes to the most complex specimens, leaving the operator time for other chores. In many cases, materialographic preparation has been a bottle-neck. MAPS eliminates this problem and leaves plenty of time for the one task which has not yet been satisfactorily automated: microscopic examination and evaluation of a materialographic structure.

## Reduce preparation costs with MAPS

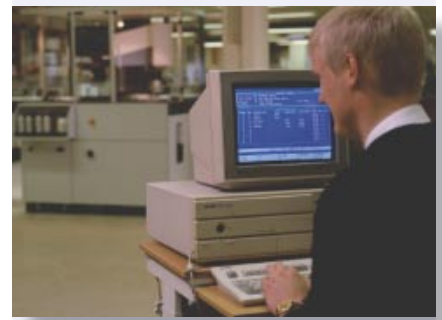
Automation not only means unique reproducibility and high quality – it also implies large cost savings. Within the world of materialography it is gradually realized that the initial cost of automatic equipment is more than counterbalanced by savings in time, labour and consumables. Materialographic preparation employs costly diamond products. Due to precise, automatic control of consumables consumption, MAPS takes care that exactly the right amount is used – no more, no less.

Cost saving analysis: investment in a MAPS system, depreciated over a period of three years, compared to an existing Abra system.



# PC-controlled operation

While MAPS is working, the operator may monitor the process from outside the production area via a PC



MAPS can be programmed directly on the separate modules. A maximum of 30 preparation programs may be stored in each module's memory. However, MAPS becomes an even more versatile tool when controlled by a PC. For this purpose, a PC-program, MAPS Master, has been developed. MAPS Master allows for a controlled batch processing and supervision of the preparation process. Also included in MAPS Master is a user's database with facilities for creating, printing and storing up to 8,000 individual preparation methods. MAPS Master controls procedures, dosing, process times and all movements of specimen holder arm and conveyers. Switching to a different preparation procedure is just a matter of selecting from the PC database and pressing start.

## High capacity specimen production

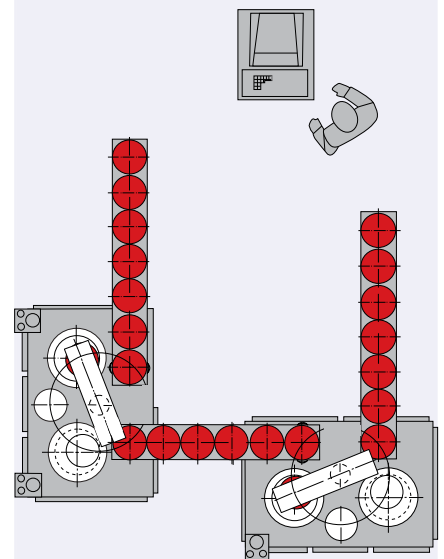
Today, quality control is gradually moving from isolated laboratories into the production area. This makes new demands to the preparation equipment within the fields of reliability and safety. MAPS is prepared for a rough life – working around the clock in an industrial environment. Sensors constantly monitor the process, ensuring a smooth and uninterrupted preparation process. In case of shutdown the operator is specifically advised which consumables to refill, etc. While MAPS is working in the production area, the operator may monitor the process from an office via the PC. With MAPS as the foundation of current quality control, adjustments in the production can be carried out with minimal delay.

## Safety

MAPS sets new standards for safety. With a totally automatic system every aspect of personal and machine safety has to be included. MAPS complies with the strictest international safety standards.

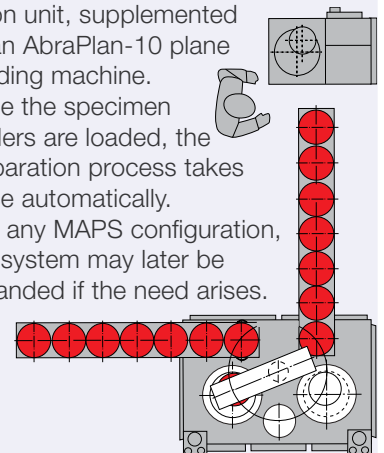
## Two typical MAPS configurations

A two-module configuration for fully automated, high-volume preparation. The two modules are controlled by a PC and linked by transfer conveyers. The two work stations in Module 1 perform plane grinding, fine grinding and specimen cleaning. Module 2 carries out the two polishing steps, plus cleaning and drying. A queue function makes it possible to line up different specimen holders. It also eliminates stoppages: the transport system is non-synchronous, so the conveyers serve as accumulators of specimen holders.



A basic configuration with one preparation unit, supplemented by an AbraPlan-10 plane grinding machine.

Once the specimen holders are loaded, the preparation process takes place automatically. Like any MAPS configuration, this system may later be expanded if the need arises.





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## Technical data

<b>Connections</b>	Power: Compressed-air supply: Water supply: Standard PC:	Three-phase 6 bar (90 psi) – consumption approx. 50 l/min Mains water input, output to normal drain RS 485 multidrop communication line
<b>Main dimensions</b>	MAPS Preparation Module Height: Width: Depth: Weight:	1900 mm 1470 mm 1080 mm 850 kg
<b>Specimen holders</b>	Size:	160 mm dia. and 200 mm dia. Abra specimen holders with conveyer ring
<b>Specimen holder arm</b>	Specimen holder motor: Operating force:	150 rpm, 0.37 kW (0.5 HP) 50-700 N in steps of 50 N, automatic adjustment in the phases
<b>Plane grinding work station</b>	Main motor: Rotation speed: Grinding stone: Dressing: Recirculation cooling unit:	5.5 kW (7.4 HP) 1450 rpm Diameter 356 mm, grinding width 115 mm Automatic dressing of grinding stone 60 l/min. Container capacity 65 l
<b>Fine grinding and polishing work station</b>	Main motor: Rotation speed: Grinding/polishing disc:	550 W (0.7 HP)/1110 W (1.5 HP) 150/300 rpm Diameter 230-350 mm
<b>Cleaning station</b>	Programmable automatic cleaning:	- Cleaning time - High-pressure water rinsing - Cleaning with detergent - Cleaning with alcohol - Air-drying
<b>Operating system</b>	Memory capacity: Display:	30 preparation programs: 10 fixed; 20 open. 13-line LCD with 42 characters
<b>Conveyor</b>	Width:  Length: Capacity:	For 160 and 200 mm dia. Abra specimen holders with conveyer ring 1650 mm 6 specimen holders
<b>Dosing system</b>	Bottle for DP-Suspension: Bottle for DP-Lubricant: Bottle for OP-Suspension:	250 ml 1000 ml 1000 ml
<b>MAPS Master</b>	Communications unit: PC-software Data base capacity: Requirements:	RS485  8,000 preparation programs PC running MS-DOS

## Specifications

	Code
<b>MAPS Preparation Module</b> With 1 plane grinding station and one fine grinding/polishing station (150/300 rpm), with recirculating cooling unit (MAPRE) With 2 fine grinding/polishing stations (150/300 rpm),	MAPSE MAPFI
<b>Conveyor</b> feed module connection module delivery module	MAPEF MAPCO MAPLI
<b>Recirculation Cooling Unit</b> contents 65 l, with a rolling pallet	MAPRE
<b>Recirculation Kit</b> for connection of 2 work stations to one recirculation cooling unit	MAPIT
<b>Cooling Arrangement</b> for preparation disc	MAPOL
<b>Dosing System</b> box with room for 3 bottle units. Bottle units (MAPSU or MAPOP) required	MAPTH
<b>Bottle Unit</b> for dosing system, with room for 2 DP-Suspensions and 1 lubricant for dosing system, with room for 2 OP-Suspensions	MAPSU MAPOP
<b>Level Indication Unit</b> for monitoring the level of suspensions and lubricants in the bottles. Level indicators (MAPDU or MAPPO) required	MAPIN
<b>Level Indicator</b> for bottle unit with DP-Suspension (MAPSU) for bottle unit with OP-Suspension (MAPOP)	MAPDU MAPPO
<b>Stock Removal Unit</b> for measuring of the material removal during the plane grinding process and monitoring of abnormal vibrations	MAPOM
<b>Separation Unit</b> for collection of the waste alcohol from the cleaning station	MAPAL
<b>Manual Feeding Station</b> For MAPS without conveyor	MAPEX
<b>Drying Fan</b> for drying of specimen holders	MAPFA
<b>Conveyor Ring</b> for mounting on specimen holder, 160 mm dia. for mounting on specimen holder, 200 mm dia.	MAPEL MAPIR
<b>MAPS Master</b> PC software with method data base/editor. Operates and controls the MAPS preparation modules. Converter for communication included. 3½" diskettes.	MAPMA

Struers' products are subject to constant product development. Therefore, we reserve the right to introduce changes in our products without notice.