Malvern Panalytical
a **spectris** company

Claisse® is a Malvern Panalytical brand

M4™ FUSION INSTRUMENT

Keeping ahead through expertise in sample preparation by fusion

AN INSTRUMENT THAT HAS **PROVEN ITS WORTH**

The M4 fusion instrument has three fusion positions and is heated by gas. Being used to prepare glass disks for XRF analysis and solutions for AA and ICP analysis, this fully automatic instrument ensures uniform heating for reproducible and accurate results. The M4 instrument is the best in terms of low maintenance cost.

The M4's value to sample preparation by fusion

- Low cost of ownership
- Simple to use
- High analytical performance

MINING / MINERALS

The high-productivity and robustness of the M4 instrument makes it an appropriate tool to prepare mining samples.

COSMETICS

The versatility of the M4 is convenient when it comes to prepare cosmetic samples.

RESEARCH

With this simple and low maintenance instrument, you can quickly switch from producing glass beads for XRF to producing solutions for ICP analysis. It then facilitates your experiments.

FOOD

This highly safe instrument has a user-friendly interface that simplifies the preparation of food samples.

BUILDING MATERIALS

The M4 is a great quality control tool leading to very high analytical performance and allowing the obtention of precise and accurate results.

ACADEMIA

The M4 is easy to use and requires low maintenance. It's therefore a great choice for universities.

PHARMACEUTICALS

In addition to providing excellent repeatability, the M4 can be used to prepare peroxide and borate solutions.
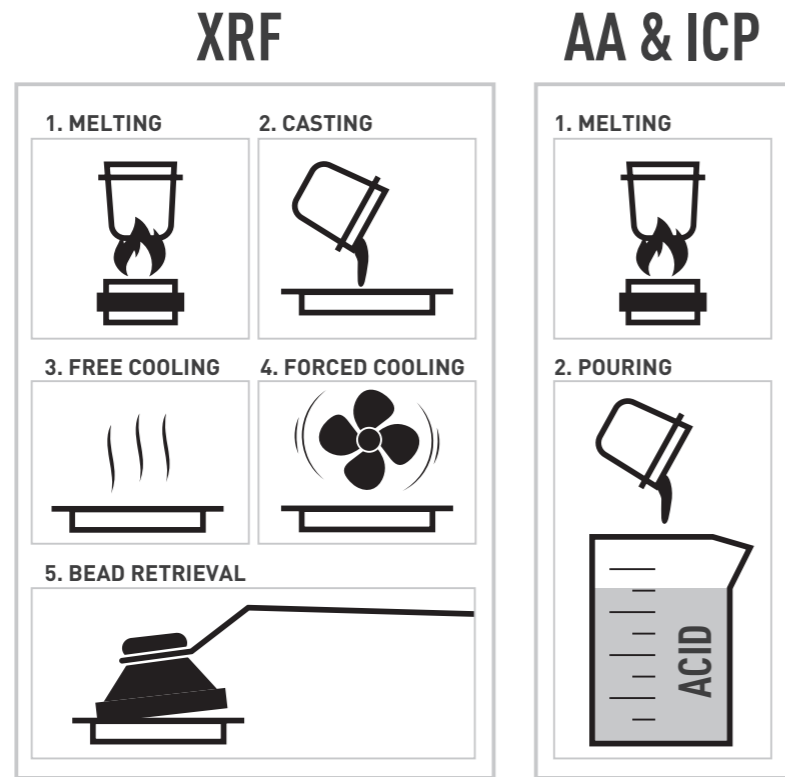
ENVIRONMENTAL

The M4 instrument is useful for the preparation of soils and sediments since it leads to high-quality analytical results.

WHAT IS **FUSION?**

Fusion is a sample preparation method developed in the mid 50s. It consists of dissolving at high temperatures a fully oxidized sample in a suitable solvent (a flux) in a platinum, zirconium or graphite crucible. The melted mixture is agitated and poured into a mold to create a glass disk for XRF analysis. It can be poured into a beaker to create a solution for AA or ICP analysis.

XRF

1. MELTING
2. CASTING
3. FREE COOLING
4. FORCED COOLING
5. BEAD RETRIEVAL

AA & ICP

1. MELTING
2. POURING

ACID

Why should I use fusion in my laboratory?
This universal technique has numerous benefits when you compare it with other sample preparation methods such as pressed pellets or acid digestion.

	Fusion	Pressed pellets
Affected by mineralogy	No	Yes
Affected by particle size	No	Yes
Desirable size of powder (microns)	50-100 (easy)	5-30 (difficult)
Accuracy	≤1%	≤10%
Easy calibration with synthetic standards	Yes	No
Application of matrix correction	Yes	No

WHY INVEST IN THE M4 **FUSION INSTRUMENT**?

High analytical performance

· Inter-burner repeatability at each fusion cycle
· Stable oxidizing flames leading to excellent repeatability
· High accuracy
· Consistent temperature and flame control
· Superior homogenization of the melt (the crucibles rotate while inclined)
· Specially designed burners.

Programmable fusion parameters

· Gas flow
· Duration
· Mixing speed and amplitude
· Crucible angle
· Agitation speed and angle
· Cooling air flow
· Magnetic stirring speed.

Optimized method development

· Visualization of the entire fusion process to facilitate the method development.

Ultimate safety

· Fully automated pouring
· No manipulation of hot vessels (cold-to-cold operation)
· Automatic ignition and flame watching system
· Safety cabinet.

Easy to use

· Fully automatic one-touch operation
· Library of predefined fusion methods.

QUICK **RETURN ON INVESTMENT** (ROI)

Low cost of ownership
· 2 preparation modes in 1 instrument
· Easy installation
· Simple and efficient mechanism made of long-lasting parts
· Molds and crucibles can be washed and replaced.

Minimal infrastructure required
· Small and compact: fits in limited space
· No burner calibration requested
· No compressed air or O_2 needed.

Tailored solutions through expertise

Malvern Panalytical experts are the reference for all steps of the fusion process or development of new applications. Their personalised solutions allow customers to properly manage risks, reach a quick ROI, and benefit from a large database of preparation methods for a broad range of samples.

TECHNICAL **SPECIFICATIONS**

Productivity
• Produces up to 3 samples simultaneously • Prepares glass disks for XRF analysis • Prepares borate solutions for AA and ICP analysis

Heating
• Liquefied petroleum gas (LPG) and natural gas

Electrical	
Electrical	• Voltage: 115 VAC 115-230 VAC • Current: 1 A • Frequency: 50-60 Hz • Power: 120 VA

Gas Requirements	
Gas requirements	• Gas type: Propane, other LPG or natural gas • Input pressure for other LPG: 62 ± 7 kPa (9 ± 1 psi) • Input pressure for natural gas: 69 ± 7 kPa (10 ± 1 psi) • Max. input pressure regulator: 1 720 kPa (250 psi) • Mean consumption* (propane): 50 g / sample (2 oz. /sample) • Max. calorific power per burner (propane): 9.6 kW (33 000 BTU/h) • Number of burners: 3 *The gas consumption depends on the fusion program

Dimensions	
With safety cabinet	**Without safety cabinet**
• Height: 41 cm (16 in.) • Depth: 45 cm (17.5 in.) • Width: 52 cm (20.5 in.) • Weight: 23 kg (50 lb.)	• Height: 43 cm (17 in.) • Depth: 36 cm (14 in.) • Width: 43 cm (17 in.) • Weight: 17 kg (38 lb.)

Programmable Fusion Parameters
• Gas flow • Duration • Mixing speed and amplitude • Crucible angle • Agitation speed and angle • Cooling air flow • Magnetic stirring speed

Control and Operation
• One-touch operation • Can be controlled through a computer • Easily adaptable software • Alarm when the cycle is completed

Safety
• User operation levels are protected by a password • Safety cabinet • No O2 required • Certified CE CSA

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WHY CHOOSE
MALVERN PANALYTICAL?

We are global leaders in materials characterization, creating superior, customer-focused solutions and services which supply tangible economic impact through chemical, physical and structural analysis.

Our aim is to help you develop better quality products and get them to market faster. Our solutions support excellence in research, and help maximize productivity and process efficiency.

Malvern Panalytical is part of Spectris, the productivity-enhancing instrumentation and controls company.

www.spectris.com

SERVICE & **SUPPORT**

Malvern Panalytical provides the global training, service and support you need to continuously drive your analytical processes at the highest level. We help you increase the return on your investment with us, and ensure that as your laboratory and analytical needs grow, we are there to support you.

Our worldwide team of specialists adds value to your business processes by ensuring applications expertise, rapid response and maximum instrument uptime.

- Local and remote support
- Full and flexible range of support agreements
- Compliance and validation support
- Onsite or classroom-based training courses
- e-Learning training courses and web seminars
- Sample and application consultancy

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