PD INSTRUMENTS

Fusion Technology

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Sample preparation:

While preparing a sample for X-ray fluorescence analysis, the following options are available:

- a sample as loose powder with the use of cups and films
- a sample pressed with a press
- a sample fused by means of a fusion machine

You do not know how to prepare your samples?

Call us or send us an e-mail and we will choose a method depending on your needs and time. We may also test the process of pressing or fusing of your samples to make sure the choice is correct.

If...

You expect the best outcomes, results without disruptions stemming from the effects of graining size or differences in the density of the material, you should choose a sample of a fusion bead. Fusing is a method allowing to increase the precision of the analysis as a result of a sample homogenization producing a fusion bead with a perfect surface.

To prepare a sample of a fusion bead, one needs:

- sample
- flux
- fusion machine
- platinum dishes

We offer gas fusion machines

Vulcan:

- automatic version (MA)
- used in different applications (e.g. cement, sands, ferroalloys, raw materials)
- microprocessor controlled
- equipped with a touchscreen
- possibility of saving 10 different fusing programmes
- two-, four- and six-station
- with an additional option of mold assembly control (at customer's request)
- with an additional function of crucible covering (at customer's request)

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Technical data	VULCAN 2MA	VULCAN 4MA	VULCAN 6MA
Number of stations:	2 XRF	4 XRF	6 XRF
Voltage:	110 V/60 Hz 230 V/50 Hz	110 V/60 Hz 230 V/50 Hz	110V/60 Hz 230V/50 Hz
Power:	170 W	210 W	210 W
Reached temperature:	0-1.600 °C	0-1.600 °C	0-1.600 °C
Required air pressure:	>5 bar	>5 bar	>5 bar
Natural gas consumption:	250 mbar	250 mbar	250 mbar
Required pressure of propane:	250 mbar	250 mbar	250 mbar
Required oxygen pressure:	2 bar	2 bar	2 bar
Air consumption:	max. 1 m^3/h	max. 2 m^3/h	max. 3 m^3/h
Required pressure of natural gas:	max. 0.66 m^3/h	max. 1.2 m^3/h	max. 1.86 m^3/h
Propane consumption:	max. 0.3 kg/h	max. 0.6 kg/h	max. 0.9 kg/h
Oxygen consumption:	max. 0.5 m^3/h	max. 1 m^3/h	max. 1.5 m^3/h
Lenght:	530 mm	700 mm	700 mm
Width:	530 mm	530 mm	530 mm
Height:	300 mm	300 mm	300 mm
Weight:	~ 40 kg	~ 45 kg	~ 50 kg
Number of samples per hour:	6	12	18

At customer's request we have the possibility of producing two- and four-station manual fusion machines (M) and other versions, in accordance with customer's expectations, e.g. automatic fusion machine MA, four-station with the control of mold assembly and function of crucible covering.

For more information, please refer to our website or contact us by e-mail or telephone call.

Version Vulcan ICP/AAS:

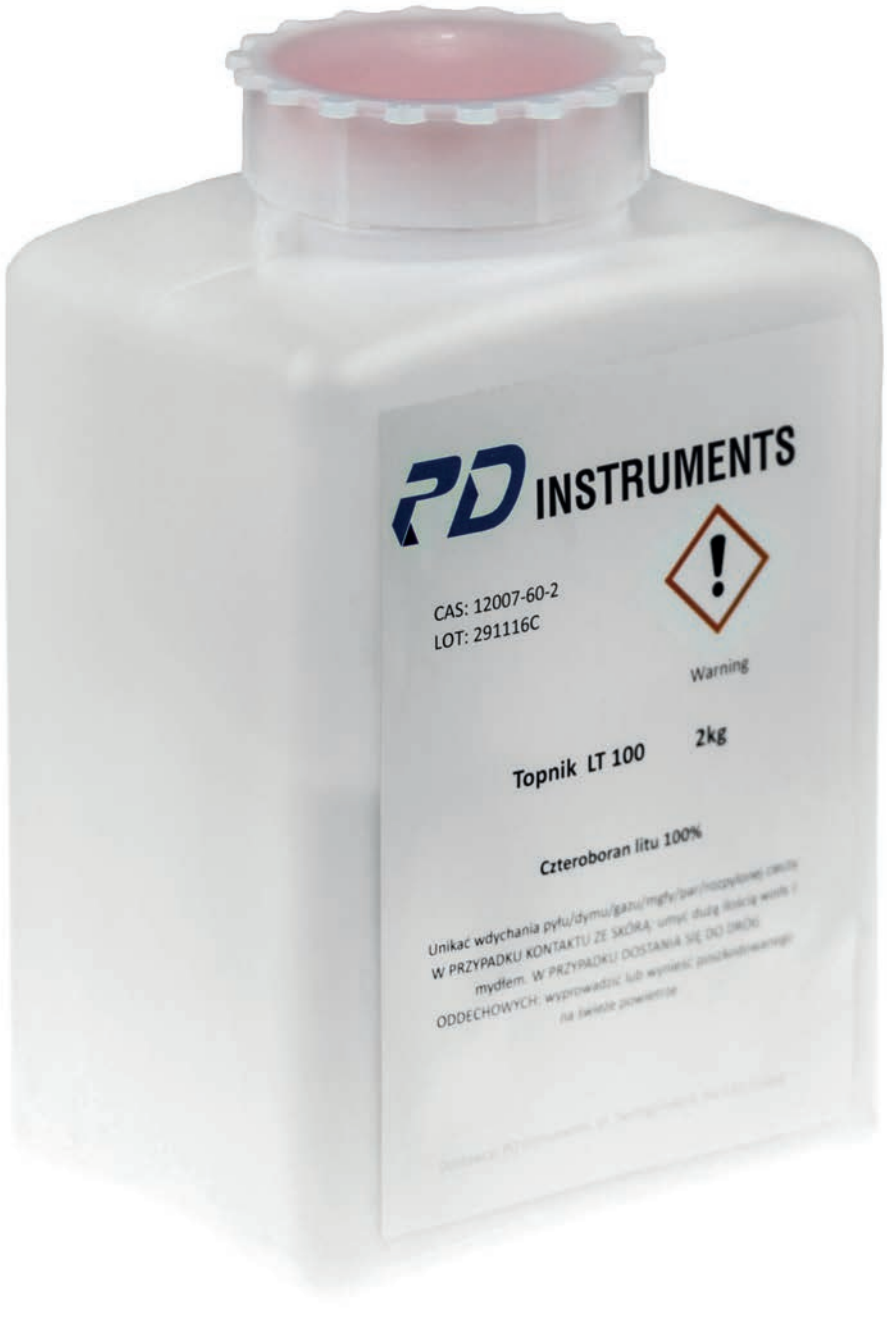
- preparation of samples for ICP/AAS analysis
- automatic versions
- possibility of producing the joint version of XRF and ICP, e.g. two stations XRF + one station ICP (21MA), two stations XRF + two stations ICP (22MA), etc.

Flux:

In order to receive a glass pellet, we need a substance called flux.

The most common fluxes are:

- lithium tetraborate ($Li_2B_4O_7$) of fusing temperature 920°C
- lithium metaborate ($LiBO_2$) of fusing temperature 845°C
- mixture of lithium tetraborate with lithium metaborate, e.g. 66:34; 50:50, 35:65
- the fluxes exemplified above with additives, such as: LiBr, NH_4I, LiI



Examplary flux composition:

Symbol	Description
1020100	FLUX LT100: Lithium metaborate granular 100 do 600µm
1022200	FLUX LT100 D: Lithium tetraborate powder <100µm
1017800	FLUX LM100: Lithium metaborate granular 100 do 600µm
1015900	FLUX LT80:LM20: 80% Lithium tetraborate /20% lithium metaborate granular
1011200	FLUX LT66:LM34: 66% Lithium tetraborate /34% lithium metaborate granular
1007300	FLUX LT50:LM50: 50% Lithium tetraborate /50% lithium metaborate granular
1003200	FLUX 12:22: 35,3% Lithium tetraborate /64,7% lithium metaborate granular
1007000	FLUX LT20:LM80: 20% Lithium tetraborate /80% lithium metaborate granular
1018900	FLUX LT100+02LiBr: LT-100 + Add.: 0.2% Lithium bromide
1019200	FLUX LT100+05LiBr: LT-100 + Add.: 0.5% Lithium bromide
1014600	FLUX LT66:LM34+02LiBr: LT66:LM34 + Add.: 0.2% Lithium bromide
1012500	FLUX LT66:LM34+05LiBr: LT66:LM34 + Add.: 0.5% Lithium bromide
1012600	FLUX LT66:LM34+05LiI: LT66:LM34 + Add.:0.5% Lithium iodide
1012800	FLUX LT66:LM34+10LiI: LT66:LM34 + Add.:1.0% Lithium iodide

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Other options are also available. If you are interested, do not hesitate to contact us. In our offer, we also have additives used in special cases during the fusing process. These are:

- oxidants
- catalyst
- agent reducing surface tension

Symbol	Description	Weight
PDI-LiBr	Agent reducing surface tension	100 g
PDI-Utl_1	Oxidants for ferroalloys and slag	250 g
PDI-Utl_2	Oxidants for ferroalloys and metals	250 g
PDI-Kat_1	Catalyst for FeV, FeCr, FeTi	1000 g

Platinum dishes:

In order to conduct the fusion process, you need dishes which are resistant to high temperature. To this end, crucibles and molds are used which are made of 95% platinum and 5% gold (most popular ones Pt/Au 95/5).

Platinum dishes with zirconium oxide are also available on the market. Their characteristic feature is higher resistance and and longer utilization time. All crucibles and molds are also available in this version.

Description	OD mm	ID mm	Height mm	Bottom mm	Weight g
Crucible	34	20	38	0.5	45
Crucible	36	22.5	38	0.5	54
Mould	31	29	3.8	0.8	31
Mould	34	32	3.8	0.8	31
Mould	36	34	3.8	0.8	45
Mould	41	39	3.8	0.8	46

Recycling:

At our company, you may also recycle old materials made of platinum. Metal obtained in this way is used to produce new dishes. The only thing you pay for is the cost of production and possible difference in mass.

It is recommended to purchase tongs to minimize the risk of scratching platinum dishes while carrying.

Storage of samples:

Pressed or fused samples may be stored for a longer period of time. We recommend single boxes for pellets and gathering boxes with lids, in which the whole calibration set may be stored. Both powder reference materials, as well as pressed and fused ones, should be stored in exsiccator to ensure environment free of impurities and dampness. We have at our disposal cabinet exsiccators with shelves, drying agent and hytherograph.

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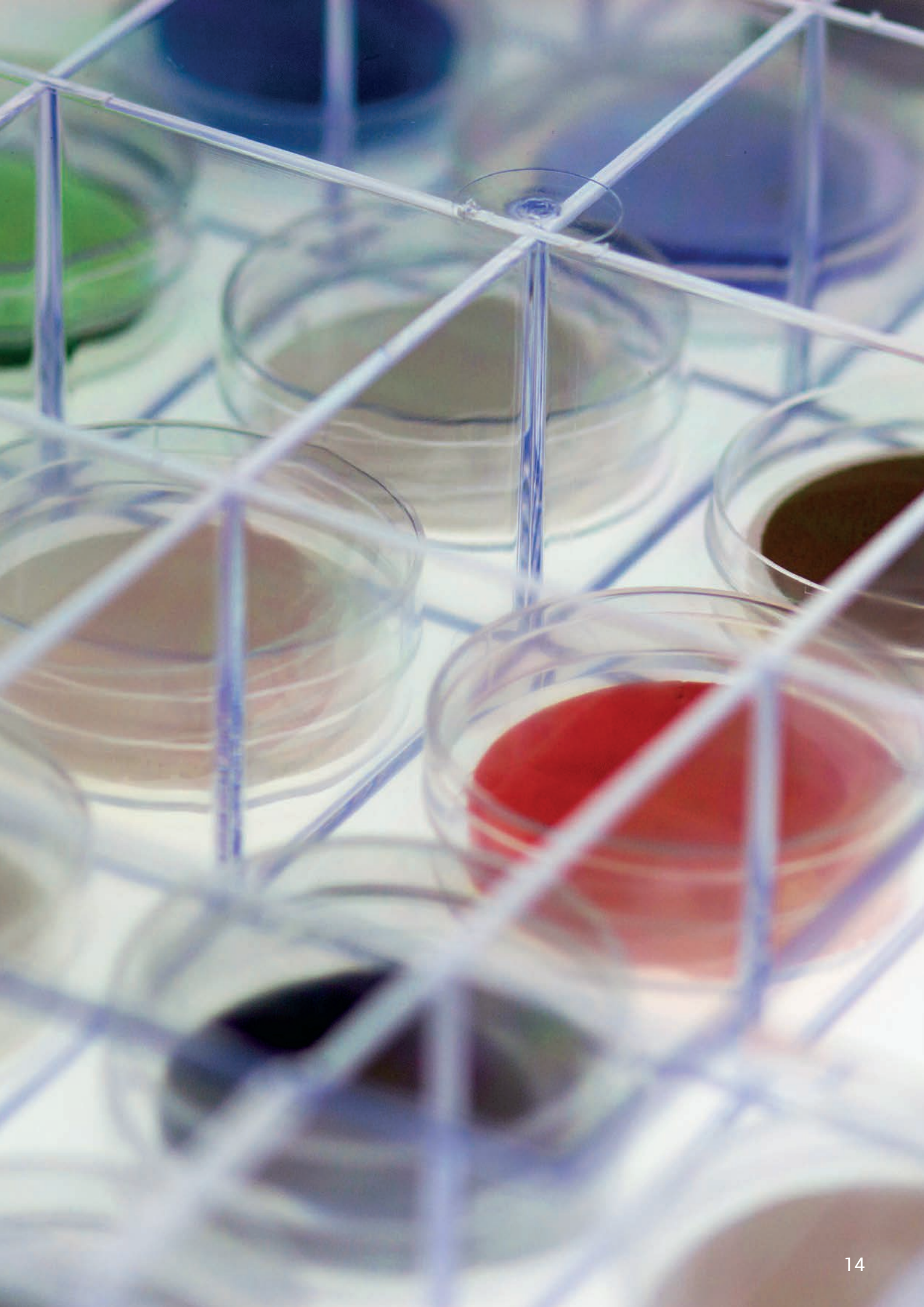
Symbol	Description
PDI-EKS1	Exsiccators with drying agent and hytherograph 35 x 41 x 34 cm (D x S x W)
PDI-EKS2	Exsiccators with drying agent and hytherograph 64 x 41 x 55 cm (D x S x W)
PDI-BOX	Gathering box with a lid and compartments for pellets 33 x 22 x 5,3 cm (D x S x W)
PDI-SZA	Cabinet with 5 drawers and 5x25 compartments for pellets
PDI-SOTB001	Single box for a pellet with dimensions ø4,5 x 1,2 cm ø4,5 x 1,2 cm

Should you have any questions concerning fused samples for X-ray fluorescence analysis, contact us and we will provide you with information and help.



Notatki

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