Specac

XRF Sample Preparation Catalogue

High-throughput sample prep for XRF and elemental analysis. Electrically powered and manual hydraulic presses

Contents

Specac XRF sample preparation

Specac offer the only high throughput benchtop press with a truly automated pressing cycle, designed with industries such as mining, cement, metals, and all other customers who regularly use XRF analysis.

Our expertise has been gained over decades of experience in the field of analytical chemistry. Specac presses have been sold the world over, winning the seal of approval from customers everywhere.

Part 1. Atlas® Presses and Dies

Part 2. Consumables and Supplies

Typical XRF Samples:

Iron ores + mining tailings
Soil and plant matter
Refractory slags + fluxes
Cement components
Glass-making additives

XRF Applications

Our Team

Introduction to Specac

Specac has been in business for approaching 50 years. Our sample preparation offering has evolved from the humble Atlas™ manual press, known to chemistry labs the world over, to the latest in high throughput benchtop pressing solutions for XRF. We now serve customers across the globe through our network of international dealers and won the Queen's Award for Enterprise in 2018. Heading into the new decade, we look forward to continuing to offer cutting edge solutions to our customers, wherever they are and whatever industry they are in.

What does Specac bring to the market?

We recognise the value fast and reliable sample preparation has in X-Ray fluorescence spectrometry, which is normally used in demanding applications and industries. We focus in creating innovative ways to make it easier and more accessible for users to be able to quickly analyse their samples. We offer the only high throughput semi-automated benchtop press, eliminating user intervention during the pressing stage, all in a small footprint format. We are continuously developing new products to keep up with the needs of sample preparation in XRF.

What support can I expect for technical and product enquiries?

The technical support team are always available to help you find a solution to your spectroscopic sampling application needs, via email or via our website. We are there too, to help in support after purchase. If you are having any difficulties with your sampling requirements, Specac can be contacted to provide you with the right, experienced advice to resolve the problem. With our state of the art demo lab we can provide hands on training, or conduct proof of concept experiments for you.

techsupport@specac.co.uk

Part 1. Atlas Series & Dies

Specac's hydraulic presses have been specially designed to meet demanding XRF applications. We offer the fastest benchtop electronic press in the market.

Our presses are robust and easy to use. The benchtop format allows analysts to save in space without compromising on performance or reliability

Autotouch™ Presses

Powered, programmable hydraulic presses for high-throughput sample prep

Manual Press

Manually pumped laboratory press for occasional sample prep

Dies and accessories

A range of dies to suit all applications

Milling and grinding

Accessories for processing samples prior to pressing

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Atlas™ Autotouch Press & Apex™

Pellet pressing is fast and easy with the Atlas™ Autotouch press when paired with the Apex™ Quick Release die: pressing cycles are sped up, operation and cleaning is much easier.

With a compact footprint and weighing in at just 95 kg (130 kg for 40 Ton model), the Atlas™ Autotouch press still maintains a large, easily accessible working area and retractable safety guards that prevents application of a load unless closed in the safe position.

Fully programmable load cycles ensure maximum consistency and repeatability of sample preparation for sensitive XRF measurements. Utilizing ordinary single-phase power supplies, the Atlas™ Autotouch press can be installed in any laboratory and is ready for use without any additional set-up.

Key Features

Fastest benchtop press in the market

- Up to 40 tonnes load
- Programmable load cycle, controlling ramp, dwell, and release rates for maximum reproducibility
- Pressing cycle can complete in under 3 minutes when partnered with the Apex™ Die
- Store up to 6 programs internally
- LED Touchscreen operation
- Smooth opening polycarbonate safety glass

Load Options

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The first of its kind on the market, the new Apex™ Quick Release XRF die makes routine pellet preparation simpler and faster than ever before. The unique, patented sleeve design completely eliminates the effort- intensive pellet extraction step.

Unlike traditional dies, which require the die set to be removed from the press, partly disassembled, and then returned to the press, the Apex™ Quick Release® Die requires only application of a light secondary load to eject the pellet from the die. The entire cycle can take as little as 2-3 minutes from loading the sample to retrieving the finished pellet.

Once the pellet is removed, the release mechanism is reset with the press of a button, and the die is ready immediately for the next sample.

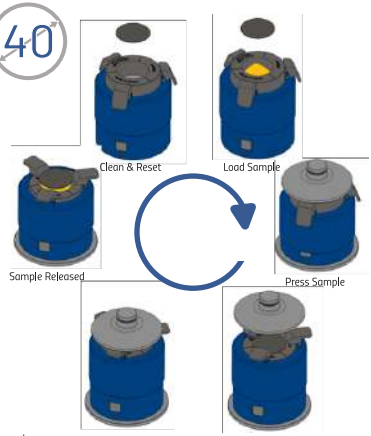
Key Features

Innovative retractable design

- Quick Release Die reduces operator involvement and frees the user to perform vital tasks
- Tedious removal, inversion and replacement of the die set for pellet extraction is completely eliminated
- No die assembly/disassembly required

Diameter Options (mm)

32 40



Apex pressing cycle diagram

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Atlas™ Autotouch Specifications & Features

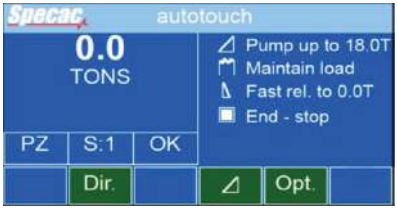
Specifications:

Specification	Autotouch 8T, 15T, 25T	Autotouch 40T
Displayed Load Range	**8T**: 1-8 Tons in 0.2 ton increments **15T**: 2-15 Tons in 0.2 ton increments **25T**: 3-25 Tons in 0.5 ton increments	**40T**: 4-40 Tons in 0.5 ton increments
Footprint (W x D)	425 x 405mm	430 x 405mm
Height	Max. 640mm	660mm
Working area dimensions (Dia. x H)	220 x 115mm	240 x 115mm
Weight	95kg	130kg
Max. Stored Programs	6	6
Max. Program Segments	10	10

Apex™ plus Autotouch™

The introduction of the Apex™ Quick Release die can dramatically cut down on operator involvement and speed up the pellet making process by mechanically automating certain steps.

In combination with the powered and programmable Autotouch™ press, high volume, high throughput sample production for intensive industries such as mining and production is now possible.



Press ready for operation

Benefits of Apex™

Pressing a pellet is a two-stage process involving sample compaction followed by pellet extraction. With a traditional die set, manual upturning and resetting of the die is required after pressing to enable the pellet to be extracted; with Apex™, a patented ejector sleeve design automatically reconfigures the die without the need to remove it. This means the press can be programmed to continue with pellet extraction shortly after the compression step is complete.

Press under load

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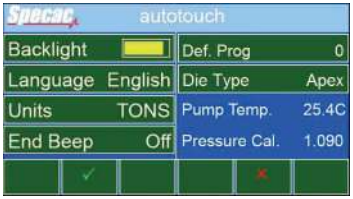
Programming for the Apex™ Quick Release Die



Programming the press is easy and intuitive, an empty program slot is selected, and individual segments are added, edited, or deleted until the desired press- ing cycle has been built.

Provided Apex has been selected as the Die Type in the options menu, a special Apex release segment step (recognised by the Λ symbol) becomes available to add to the programming screen.

The Apex program segment runs a predetermined wait (to ensure the die has had time to reconfigure) then applies a gentle load to push the pellet out of the die.

Safety Features

The Atlas™ Autotouch press has several safety features. No load can be applied if the polycarbonate safety guard is open, and a message to close the guard will be displayed until it is closed. The progress of any program may be interrupted by pressing the stop key, which is a physical button on the front panel of the press. Pressing the stop button will automatically advance the program to the load release step.

Program segment	Description
Pump 	Pumps up to the target load.
Hold 	Insets a hold step with a predefined duration from 0.1 to 99.9 minutes, or until commanded by the user.
Maintain 	The applied load is maintained by the "Auto Top-up" feature that periodically tops up the pressure in the system for a predefined duration from 0.1 to 99.9 minutes, or until commanded by the user.
Release 	Releases the applied at one of three pre-determined rates: fast, medium or slow.
Stop 	Ends the program.
Apex 	Apex mode replaces stop button and release of the pellet is done automatically.

Programming screen

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Atlas™ Manual Hydraulic Press

Specification	
Displayed Load Range	15T: 0-15 Tons 25T: 0-25 Tons
Footprint (W x D)	310mm x 190mm
Height	Max. 610mm
Working area dimensions (W x H)	134mm x 141mm
Weight	50kg

The Atlas™ Manual Hydraulic press is ideal for low-volume laboratory sample preparation for XRF, where high levels of repeatability and accuracy are not critical.

Load is applied by manually pumping the pressure system with a hand lever. The presses simple and robust frame ensures reliable operation over many years and is readily convertible to other uses.

Key Features

Award winning Press

- Robust and reliable hydraulic press for low-volume sample preparation
- Manual load application using hand pump
- Quick pressure release
- Analog pressure gauge
- Loads up to 25 Tons
- Polycarbonate safety shields

Load Options

15 TONNE 25 TONNE

Golden Seal of Quality

★★★★★

Application area: Materials testing lab

"Overall robust and continues to work as new after 5 years"

Manual Hydraulic Press

★★★★★

Application area: XRF Sample Preparation

"This press machine fulfils expectations. Only a few touches for operation and the new Apex Die eliminates unnecessary time for Sample Preparation"

Atlas Autotouch Press and Apex Die

★★★★★

Application area: Pressing of ceramic powders

"This is a great press and an instrumental part of my research"

Manual Hydraulic Press

★★★★★

Application area: Milk Powder Sample pellets

"The product is easy to use with maintenance free operations for years. An excellent buy"

Atlas Autotouch Press

★★★★★

Application area: Preparation of Potassium Bromide discs

"An extremely reliable product Easy to use. Low maintenance. Low cost of ownership"

Manual Hydraulic Press

★★★★★

Application area: Sample Prep for QC tests

"Cover almost all of our expectations. Nice to have a wider range of platens to cover all samples"

Atlas Autotouch Press

Pellet Dies

Standard XRF Dies

Key Features

Classic 5-Piece Dies

- Polished, precision-engineered pellet dies
- Compatible with all Specac presses and many others too
- (Optional) Tungsten carbide internal pellets to avoid Fe contamination
- (Optional) evacuation port

Diameter	Dimensions	Weight
40mm	Ø65mm x H110mm	2.50kg
32mm	Ø65mm x H110mm	2.45kg

Apex™ Quick Release Dies

Key Features

Innovative retractable design

- Quick Release Die reduces operator involvement and frees the user to perform vital tasks
- Tedious removal, inversion and replacement of the die set for pellet extraction is completely eliminated
- No die assembly/disassembly required
- Comes with press adaptor kit

Diameter	Dimensions	Weight
40mm	Ø96mm x H118mm	2.7kg
32mm	Ø96mm x H118mm	2.7kg

Pellet Accessories

Key Features

- Compressible support cups that wrap under and around the sample under load
- Provide support to poorly binding samples that cannot form free-standing pellets
- Available in aluminium or plastic
- Suitable for 32mm and 40mm die sets

Sample pressing cups

Protective pellet films

Key Features

- Protect pressing surfaces from cross-sample contamination
- Applied to the surface in direct contact with the sample
- 32, 35 and 40mm diameters

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Planetary Ball Mill

The P6 Planetary Ball Mill is a high-performance benchtop grinding mill for XRF applications. Fitted with up to two grinding bowls, sample quantities up to 450ml may be quickly and efficiently reduced to tens of microns in size. Its user-friendly design makes the P6 is easy to operate both in the field and in the lab.

Grinding Media

As grinding media we recommend either zirconia or for harder materials tungsten carbide if you are not sure, this will suit the majority of applications. The max feed size is 10mm in diameter.

Material (bowl+balls)	Main components of the material	Density (g/cm^3)	Abrasion resistance	Sample type
Agate	(99.9% SiO_2)	2.65	Good	Soft Samples
Zirconium oxide	(96.2% ZrO_2)	5.7	Very good	Fibrous, abrasive samples
Turgsten carbide	(93% WC+6% Co)	14.9	Very good	Hard, abrasive samples
Silicon nitride	(90% Si_3N_4)	3.25	Extremely good	Metal-free grinding
Hardened steel	Bowl: (11-12% Cr) Balls: (1.0-1.65% Cr)	7.9	Good	Hard, brittle samples

Key Features

- High speed planetary ball mill (up to 650rpm)
- Produces fine powders 40-200µm in size
- Grinding balls and bowls in a range of materials and capacities
- Maximum useful sample capacity of 450ml
- User friendly safe-lock-system to prevent accidents
- Benchtop deisgn makes it portable for in field and lab work
- Easily grind hard, medium-hard, brittle and moist materials

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Milling samples for XRF analysis

Sample Volume

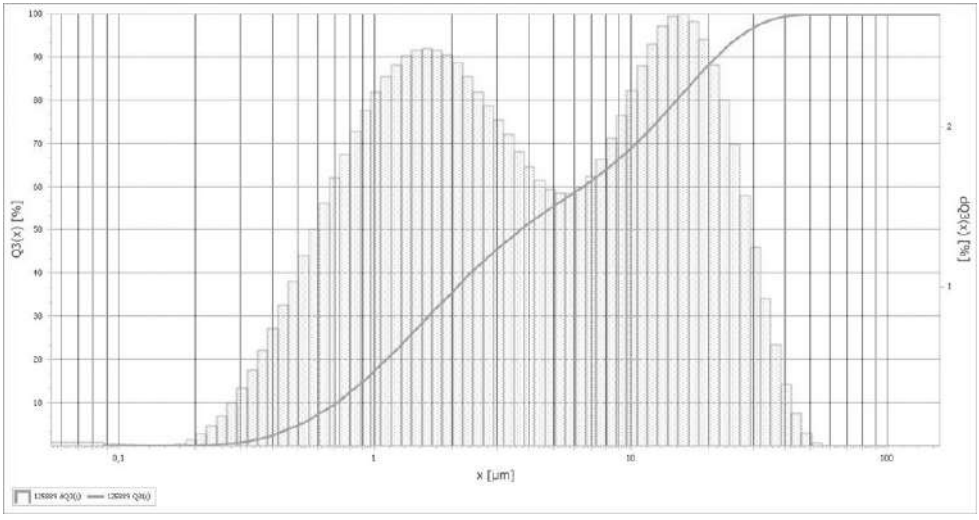
A typical mill to reduce the size of the solid and to produce a homogenous powder, which can be used in the pellet press, is a Planetary ball mill. The P6 is able to work with one 250ml bowl for 100ml of sample or with two 80ml bowls with 30ml of sample.

Number of grinding balls per bowl

Ball diameter (mm)	Number of balls (80 ml bowl)	Number of balls (250 ml bowl)
5	250 - 300	1200 - 1300
10	25 - 30	50 - 150
15	10	45 - 50
20	5	15 - 20
30	-	5 - 6

Results

The specification for the particle size is typically < 45 µm. After 10 minutes of grinding cement clinker in a 250 ml bowl the following particle size distribution is obtained:



The result is that 99.4% of the sample is reduced to under 45 µm after ten minutes. The two peaks correspond to material found at the center (larger particles) and edges (smaller particles) of the bowl.

Analysis of Portland cement pellets by XRF

(Application note AN18-03)

Particle size, mineral composition, or density can all affect the intensity of the characteristic emission peaks and increase background scattering. These effects rule out reliable quantification of sample composition (1).

Grinding sample powders to a fine particle size and pressing them into a smooth, flat pellet should reduce scattering and improve the detection of light elements.

Experimental

Samples of Type 1 Ordinary Portland Cement (Dragon Alfa, UK) were used as-purchased.

Loose powder preparation

10 g of sample was placed into an open-ended sample cup and covered with a 6 µm Mylar® film window.

Pressed pellet preparation

The sample was milled and homogenized with 20wt% of cellulose binder (SpectroBlend®) using a planetary ball mill. Pellets were pressed in aluminium sample cups at 20 tonnes using a 25 T Atlas® Autotouch Press and a 40 mm APEXTM Quick Release Die.

Spectral acquisition

Spectra were recorded on a high-throughput wavelength dispersive XRF instrument with vacuum capability.

Results & Discussion

Compound	Powder (%)	Pellet (%)	Expected (2)
SiO_2	7.75	18.90	19.0-21.8
Al_2O_3	1.16	4.35	3.9-6.1
Fe_2O_3	5.70	2.32	2.0-3.6
MgO	0.12	1.06	0.8-4.5
CaO	78.57	65.60	61.5-65.2
Na_2O	Not detected	0.25	0.2-1.2

Table 1 Results of Portland Cement fundamental parameter quantification

Heavy and light elements

XRF spectra for the loose powders and pressed pellets show clear differences (Figure 1). The lightest element Na is undetectable in the powders, while the signals from Mg, Al, and Si are much reduced. As expected, the signal from the heavier elements such as Fe is not affected.

The samples prepared as pellets show higher signal-to-noise and allow the lightest elements to be detected easily above the background. The detection of light elements is further improved by avoiding the use of thin film coverings, which allows measurement under a vacuum.

Quantification of composition

The ability to clearly detect all the elements in the sample becomes critical for accurate quantification, as can be seen in Table 1. In the powder samples, underestimation of the lighter Al, Mg, and Na elements leads to overestimation of Fe and Ca in the cement. The pellet samples result in a quantification which is within the range established by averaged laboratory experiments.

Conclusions

Loose powder sample preparation is a low-intensity method for the detection of heavy elements, however, quantification is unreliable due to the inability to detect lighter elements.

Therefore, pellet preparation is essential for accurate quantification of sample composition. It allows detection of the lightest elements and prevents underestimation of the other light elements.

[1] **Jenkins, Ron.** Quantitative X-Ray Spectrometry, Second Edition. New York: Marcel Dekker, Inc., 1995

[2] **Kosmatka, Steven H., Kerkhoff, Beatrix, and Panarese, William C.** Design and Control of Cenrete Mix- tures, 14th Edition. Skakie: Portland Cement Associa- tion, 2002.

Ordering Information

Atlas™ Presses and Dies

Presses & Dies:

Part Number	Description	Product Family
GS2583X GS2582X GS2581X GS2580X	Atlas AutoTouch 40T Hydraulic Press Atlas AutoTouch 25T Hydraulic Press Atlas AutoTouch 15T Hydraulic Press Atlas AutoTouch 8T Hydraulic Press	Atlas™ Autotouch (Page 3)
GS25011 GS15011	Atlas Manual 25T Hydraulic Press Atlas Manual 15T Hydraulic Press	Atlas™ Manual (Page 8)
GS26301 GS26302 GS26303 GS26304	40mm Apex™ Quick Release Die for 8,15 and 25T Atlas™ Presses 32mm Apex™ Quick Release Die for 8,15 and 25T Atlas™ Presses 40mm Apex™ Quick Release Die for 40T Autotouch 32mm Apex™ Quick Release Die for 40T Autotouch	Apex™ Quick Release Die (Page 4/9)
GS26104 GS26103 GS26102 GS26101	40mm Atlas Standard Die Set (no evacuation port) 32mm Atlas Standard Die Set (no evacuation port) 40mm Atlas Standard Die Set (with evacuation port) 32mm Atlas Standard Die Set (with evacuation port)	Standard XRF Dies (Page 9)

X is a power supply code. Please quote the following region codes.

0 – 230v 50Hz (UK/EU)
1 – 110v 60Hz (USA)
2 – 100v 50/60Hz (JAPAN)
3 – 220v 50Hz (CHINA)
4 – 220v 60Hz (KOREA/SAUDI)

Selected spares & accessories:

Part Number	Description	Product Family
GS15100 GS15101	Replacement seals and gaskets kit Hydraulic oil (1 litre)	Atlas™ Manual (Page 9)
GS26310 GS26311 GS26330	Apex Die Pressing Anvil for 40T Autotouch Press Apex Die Pressing Anvil for all other Atlas™ Presses Base Locator Place for Apex Dies	Apex™ Quick Release Die (Page 5/10)
GS26134 GS26133 GS26161	40mm **Tungsten Carbide** internal pellets 32mm **Tungsten Carbide** internal pellets Extractor cap for 32mm and 40mm Standard dies	Standard XRF Dies (Page 10)

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Ordering Information

Pellet Dies and Mills

Pelletising Aids:

Part Number	Description	Product Family
GS26005 GS26006 GS26007 GS26008	32mm Aluminium Cups Tapered Wall 1,000/pk 40mm Aluminium Cups Tapered Wall 600/pk 32mm Aluminium Cups Straight Wall 1,000/pk 40mm Aluminium Cups Straight Wall 1,000/pk	Aluminium Pressing Cups (Page 10)
CX0552E CX0553E CX0554E	Plastic Briquetting Cup, 31.0mm Dia. x 6.4mm Tall 500/pk Plastic Briquetting Cup, 34.3mm Dia. x 6.4mm Tall 500/pk Plastic Briquetting Cup, 39.7mm Dia. x 6.4mm Tall 500/pk	Plastic Pressing Cups (Page 10)
CX7032E CX7035E CX7040E	SpectroPellet® Protective Die Pellet Film for 32mm dies; 500 per pkg SpectroPellet® Protective Die Pellet Film for 35mm dies; 500 per pkg SpectroPellet® Protective Die Pellet Film for 40mm dies; 500 per pkg	Protective Pellet Films (Page 10)

Planetary Ball Mill:

Part Number	Description	Product Family
FRO6200000	Planetary Mono Mil Classic Line 100-120/200-240V, 50-60Hz, 1000 Watt	P6 Planetary Ball Mill (Page 11)

Grinding bowls for Planetary Ball Mill

	250 ml	80 ml
Agate	FR50205500	FR50405500
Sintered corundum	FR50206000	FR50406000
Hardmetal tungsten carbide	FR50208000	FR50408000
Hardened stainless steel	FR50209000	FR50409000
Zirconium oxide	FR50211000	FR50411000
Silicon nitride	FR50231000	FR50431000

Grinding balls for Planetary Ball Mill

	ø5 mm	ø 10 mm	ø 15 mm	ø20 mm	ø30 mm
Agate	FR55005005	FR55010005	FR55015005	FR55020005	FR55030005
Sintered corundum	-	FR55010006	FR55015006	FR55020006	FR55030006
Tungsten carbide	FR55005008	FR55010008	FR55015008	FR55020008	FR55030008
Stainless steel	FR55005009	FR55010009	FR55015009	FR55020009	FR55030009
Zirconium oxide	FR55005027	FR55010027	FR55015027	FR55020027	FR55030027
Silicon nitride	-	FR55010031	FR55015031	FR55020031	FR55030031

Part 2. Consumables for liquid and solid sampling

Specac offer a range of consumables for sampling of liquids and loose, uncompressed powders including sample cups and thin-film sample support windows.

A range of grinding and pelletizing additives may be purchased to aid pressing of certain samples.

Borate fluxes for use with fusion ovens in preparation of fused sample beads are also available.

Solid and Liquid sample cups

Single and double ended sample cups for various spectrometers

Thin film windows

A range of film windows in different materials, thicknesses and formats

Binding and Fluxing

Lithium borate fusion fluxes and grinding additives

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XRF sample cup & thin film window guide

Sample cups are disposable plastic containers used for sampling of liquids and powders, sealed with a thin film window that is transparent to the measuring X-Rays. There is a large variety of sample cups and film windows on offer, and the following serves as a rough guide to choosing the correct type.

Choosing the right size

Different spectrometers require different cup sizes. Consult the documentation for your spectrometer to deter- mine the correct diameter and height of sample cup to fit the holder on the spectrometer. The following table may be consulted as a guide.

Manufacturer	Spectrometer	Sample Cup
Bruker	S2 Puma	2140, 2143, 2144
Bruker	S2 Ranger	2143
Bruker	S4	2140
Bruker	S8 Tiger	2143, 2144, 2195, 1095
Horiba	SLFA, Mesa 7220	1083
Malvern Panalytical	Epsilon 3	2135
Malvern Panalytical	Epsilon 5	2145, 2146
Malvern Panalytical	Venus 200	2195, 1095
Oxford Instruments	Lab-X	1940L
Rigaku	Mini-Z	2140
Rigaku	Primus, Rix, ZSX-100	2195,1095
Spectro	Xepos, X-Lab, Titan	2131, 2135
Spectro	Phoenix, Phoenix II	2131, 2135
Spectro	IQ	2132
Thermo	Advant'x	2146
Xenemetrix	X-Calibur, X-Cite	2131, 2132
XOS	Sindie	1083

Single or double open-ended?

A double open-ended cup is prepared by placing a film window over one end and then filling the cup from the opposite end so that the sample is supported directly by the film window. If the film window is very thin, or is prone to chemical attack by the sample, then it may not be desirable for the window to support the sample in this way for long periods. In these instances a single open-ended cup may be used that allows the sample to be supported by the cup itself during filling and storage, and only be supported by the window once inverted for measurement.

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XRF sample cup & thin film window guide

2100: SpectroCup® Double Open-Ended

- TrimLess® sleeve
- Top sample loading
- Internal overflow reservoir
- Vented friction fitting cap

1000: TrimLess® Sleeved Single & Double Open-Ends

- Eliminates thin-film trimming
- ThermoPlastic® seal venting

1900: "Snap-On Ring" Double Open-Ended

- Top sample loading
- "Snap-On Ring" thin-film attachment

Supporting thin film materials

The supporting window must be transparent to all the signals produced by the analytes of interest, as well as chemically compatible with the sample. There is currently a large range of window materials available in various thicknesses to contain the sample, such as polypropylene, Kapton and Mylar®. Thicker films will be more durable, but will also attenuate the X-Ray signals more strongly.

N.B. — ASTM methods for analyzing sulfur in diesel stipulate the use of Kapton or Etnom windows only.

Check out #SpectroscopyGuides for more analysis tips and advice.

Chemical	Mylar®	Poly-Carbonate	ETNOM®	Polypro-pylene®	Kapton®	Prolene®	Ultra Polyester®	Zthene™
Acids, Dilut.	Yes	Yes	Yes	Best	No	Yes	Yes	Yes
Acids, conc.	Yes	Yes	Yes	Best	No	Best	Yes	Yes
Alcohols	No	Yes	Yes	Best	Yes	Best	No	Yes
Aldehydes	??	Maybe	Maybe	Best	Best	Best	??	Maybe
Alkalis, conc.	No	No	Yes	Best	Best	Best	No	Yes
Esters	No	No	Maybe	Yes	Yes	Yes	No	Maybe
Ethers	Maybe	No	Maybe	No	??	No	Maybe	Maybe
Aliphatic HC	Yes	No	Best	Yes	Best	Yes	Yes	Best
Aromatic HC	No	No	Best	No	Best	No	No	Best
Halogenated HC	Maybe	No	Maybe	No	Maybe	No	Maybe	Maybe
Ketones	No	No	Yes	Yes	Yes	Yes	No	Yes
Oxidizing Agents	Maybe	No	Maybe	Maybe	No	Maybe	Maybe	Maybe

XRF thin film windows

Fabricated and stored under environmentally controlled conditions to avoid introducing trace levels of contaminant, they are available in a variety of formats including rolls (continuous and perforated), pre-cut sheets, or supported in a card frame for ease of application.

Thin-Film Sample Support Windows

Available formats:

- 76.2 mm wide roll (continuous or pre-perforated), 91.4 metres in length
- Pre-cut circles of 35 mm, 45 mm, 63.5 mm, or 76.2 mm diameter (500 or 1000 per pack)
- SpectroMembrane® (See below)

Available materials:

Polypropylene, Mylar®, Zythene®, Etnom®, Polycarbonate®, Kapton®, Prolene®, Ultra-polyester®

The above are available in thicknesses from 1.5 µm to 12.0 µm (material and format dependent)

SpectroMembrane®

Key Features

- Thin film sample support in a frame for easy handling and to avoid contamination
- Automatically detaches from the carrier frame leaving a taut wrinkle-free sample support window.
- Packaged in 100 units to match 100 Sample Cup Sets
- Available in Etnom®, Kapton®, Mylar®, Polypropylene, Prolene®, Ultra-Polyester®, and Zythene®
- Available in pre-set thicknesses, from 2µm to 12 µm

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Grinding and fusion consumables

Grinding and pelletizing additives

- **X-Ray Mix® pre-weighted tablets (1/4g)**
  composition C: 48.7%; O: 42.6%; H: 8.1%; B: 0.6%
- **SpectroBlend® pre-weighted tablets (1/2g)**
  composition C: 81.0%; O: 2.9%; H: 13.5%; N: 2.6%)
- **Boric Acid pre-weighted tablets (1/2g)**
  composition O: 77.6%; H: 4.9%; B: 17.5%)
- **Liquid Binder® for difficult-to-bond samples**
  Polymer ingredient (C_6H_9ON) in methylene chloride solvent.

FusionFlux® borax fluxing agent

- Lithium Tetraborate $Li_2B_4O_7$ based fluxes
- Blended with lithium bromide (LiBr) or lithium iodide LiI in blends from 0.5% to 1.5%
- Additional blends with 33% to 100% Lithium Metaborate $LiBO_2$
- Formulations with non-wetting agents

See ordering information for blends

Other accessories

- Sample powder compactors to flatten and level surface before pelletization
- Sample storage pods with 5 or 10 pods: catalog, store and protect briquetted powder samples, etallographic specimens, gems, optical glasses and many other delicate items.

Ordering Information

Consumables and Supplies

Sample Cups

Double Open-Ended SpectroCup® Sample Cups				
Part Number	Series	Dia.	H.	Vol.
CX2131E	2100	30.9mm	29.2mm	12
CX2132E	2100	31.5mm	29.2mm	9
CX2135E	2100	34.3mm	29.7mm	9
CX2140E	2100	40.1mm	29.7mm	9
CX2143E	2100	40.1mm	29.7mm	19
CX2144E	2100	40.1mm	33.8mm	19
CX2145E	2100	44.7mm	29.5mm	25
CX2146E	2100	44.7mm	33.5mm	22
CX2147E	2100	44.7mm	29.5mm	11
CX2148E	2100	44.7mm	33.5mm	12
CX2149E	2100	44.7mm	39.2mm	22
CX2195E	2100	43.4mm	40.7mm	12

TrimLess® Sleeved Sample Cups				
Part Number	Series	Dia.	H.	Vol.
CX1083E	1000	42.9mm	18.5mm	9
CX1095E	1000	43.4mm	39.9mm	7

Double Open-Ended Sample Cups				
Part Number	Series	Dia.	H.	Vol.
CX2131E	1900	39.4mm	35.3mm	15

Thin Film Windows

Materials	Thickness	Roll	Pre-cut Circles	SpectroMembrane®			
				Ø35mm	Ø45mm	Ø63.5mm	Ø76.2mm
Polypropylene	6.0 µm	Y	Y	-	Y	Y	Y
	12.0 µm	Y	Y	-	Y	Y	Y
Ultra-polyester®	1.5 µm	-	-	-	-	-	Y
Kapton®	1.5 µm	-	Y	-	-	Y	Y
Mylar®	2.5 µm	Y	Y	-	-	Y	Y
	3.6 µm	Y	Y	Y	-	Y	Y
	6.0 µm	Y	Y	-	-	Y	Y
Prolene®	3.0 µm	-	-	Y	-	Y	Y
	4.0 µm	Y	Y	Y	-	Y	Y
Etnom®	2.0 µm	Y	-	-	-	Y	Y
	2.5 µm	Y	-	Y	-	Y	Y
	3.0 µm	Y	-	-	-	Y	Y
Zythene®	6.0 µm	-	-	-	-	Y	Y

Please contact Specac for ordering information for thin film windows

Ordering Information

Consumables and Supplies

Grinding and Pelletizing Additives

Part Number	Description
CX600E	X-Ray Mix®, Powder; 1lb per bottle
CX625E	X-Ray Mix®, 1/4gm Tablets; 500 tablets per bottle
CX650E	X-Ray Mix®, 1/2gm Tablets; 500 tablets per bottle
CX660E	SpectroBlend®, 44µm Powder; 1lb per bottle
CX690E	SpectroBlend®, 1/2gm Tablets; 500 tablets per bottle
CX750E	Boric Acid,1/2gm Tablets; 1000 tablets per bottle
CX800E	Liquid Binder® Additive; 1 Pint
CX2532E	PelletCups® Powdered Sample Compactors; 32mm Dia.
CX2535E	PelletCups® Powdered Sample Compactors; 35mm Dia.
CX2540E	PelletCups® Powdered Sample Compactors; 40mm Dia.
CX2545E	PelletCups® Powdered Sample Compactors; 45mm Dia.
CX2030-10E	Sample Storage Kit with 10 Sample Pods
CX2030-1E	Sample Pod Replacement (single pod)
CX2030-5E	Sample Storage Kit with 5 Sample Pods

Fluxing Agents

Part Number	Description
CX30-1000E	FusionFlux® 100% $Li_2B_4O_7$; 1 lb
CX30-1100E	FusionFlux® with Non-wetting agent 99.5% $Li_2B_4O_7$ / 0.5%, LiBr; 1 lb
CX30-1200E	FusionFlux® with Non-wetting agent 99.5% $Li_2B_4O_7$ /0.5%, LiI; 1 lb
CX30-2000E	FusionFlux® 100%$LiBO_2$; 1lb
CX30-2100E	FusionFlux® with Non-wetting agent, 99.5% $LiBO_2$/ 0.5% LiB; 1 lb
CX30-21500E	FusionFlux® with Non-wetting agent, 98.5% $LiBO_2$/ 1.5% LiB; 1 lb
CX30-3000E	FusionFlux® 80% $Li_2B_4O_7$/ 20% $LiBO_2$, 1 lb
CX30-4000E	FusionFlux® 67% $Li_2B_4O_7$/ 33% $LiBO_2$, 1 lb
CX30-4100E	FusionFlux® with Non-wetting agent, 66.67% $Li_2B_4O_7$/ 32.83% $LiBO_2$/ 0.5% LiB, 1 lb
CX30-4200E	FusionFlux® with Non-wetting agent, 66.67% $Li_2B_4O_7$/ 32.83% $LiBO_2$/ 0.5% LiI, 1 lb
CX30-5000E	FusionFlux® 50% $Li_2B_4O_7$/ 50% $LiBO_2$, 1 lb
CX30-5100E	FusionFlux® with Non-wetting agent, 49.75% $Li_2B_4O_7$/ 49.75% $LiBO_2$/ 0.5% LiB 1 lb
CX30-5200E	FusionFlux® with Non-wetting agent, 49.75% $Li_2B_4O_7$/ 49.75% $LiBO_2$/ 0.5% LiI 1 lb
CX30-6000E	FusionFlux® 35% $Li_2B_4O_7$/ 65% $LiBO_2$; 1 lb
CX30-6600E	FusionFlux® 66% $Li_2B_4O_7$/ 34% $LiBO_2$; 1 lb
CX30-6650E	FusionFlux® with Non-wetting agent, 34.83% $Li_2B_4O_7$/ 64.67% $LiBO_2$/ 0.5% LiB 1 lb

Specac

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