



PANalytical
get insight



CONSUMABLES CATALOG 2016

XRF Accessories and Consumables
Catalog

PANalytical Accessories and Consumables Catalogue

PANalytical offers a full range of accessories and consumable items for your PANalytical x-ray spectrometer system. All of the sample preparation items are evaluated by our team of XRF application specialists and are in routine use in our Westborough, MA application lab.

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Sample Holders for Solid Samples

PANalytical offers a wide selection of sample holders for solid materials to fit your requirements for pressed pellets, fused beads or metals.

Sample Holders for AxiosmAX, Axios, Axios-FAST, MagiX, MagiX-FAST, PW240X, PW260X Spectrometers:

Sample Holder, viewing size	Part Number	Notes
Stainless Steel, 6 mm	9430 044 23061	Includes clamping spring
Stainless Steel, 10 mm	9430 044 23101	Includes clamping spring
Stainless Steel, 20 mm	9430 044 23201	
Stainless Steel, 27 mm	9430 044 23271	
Stainless Steel, 27 mm	9430 044 29521	Includes clamping spring
Stainless Steel, 32 mm	9430 044 23321	
Stainless Steel, 37 mm	9430 044 23371	
Stainless Steel, 37 mm	9430 044 25371	Includes clamping spring
Stainless Steel, 48 mm	9430 044 23481	
Stainless Steel with gold plating, 27 mm	9430 044 24271	Gold plated measuring surface
Stainless Steel with gold plating, 32 mm	9430 044 24321	Gold plated measuring surface
Stainless Steel with gold plating, 37 mm	9430 044 24371	Gold plated measuring surface

Steel Ring Holders		
Press rings, 35 mm	9430 018 12351	
26 mm filters and pellets	9430 018 13261	
32 mm filters and pellets	9430 018 13321	
41 mm filters and pellets	9430 018 13411	
Backing clip for steel rings	9430 018 13991	

Centering inserts		
25 mm plastic	9430 044 22251	
33 mm plastic	9430 044 22331	
41 mm plastic	9430 044 22411	
41 mm plastic (for "lollypop" samples)	9430 044 22421	
25 mm stainless steel	9430 050 11251	
33 mm stainless steel	9430 050 11321	
41 mm stainless steel	9430 050 11411	

Sample Holders for Epsilon 5, CubiX-XRF, Epsilon 3X series, Venus and Minipal Spectrometers:

Sample Holder, viewing size	Part Number	Notes
Epsilon 5, stainless steel, 22 mm	9430 050 01221	Minimum sample size: 25 mm Maximum sample size: 51 mm
Epsilon 5, stainless steel, 35 mm	9430 050 01351	Minimum sample size: 40 mm Maximum sample size: 51 mm
CubiX-XRF, stainless steel, 37 mm	9430 016 29441	40 mm sample
CubiX-XRF, stainless Steel with gold plating, 37 mm	9430 016 29371	40 mm sample
Epsilon 3 ^X series sample holder	9430 042 11161	Minimum sample size: 25mm Maximum sample size: 45 mm
Epsilon 3 ^X series sample holder for steel press rings	9430 042 31221	
Venus sample holder, 37 mm	9430 040 21371	
Venus sample holder, 30 mm	9430 040 21301	
Venus sample holder, 25 mm	9430 040 21251	
Minipal sample holder, non-spinning	9430 040 29101	Includes plastic inserts
Minipal sample holder, spinning	9430 040 31101	Includes plastic inserts
Centering inserts		
Epsilon 5, 25 mm stainless steel	9430 050 11251	
Epsilon 5, 33 mm stainless steel	9430 050 11321	
Epsilon 5, 41 mm stainless steel	9430 050 11411	
Epsilon 5, Air filter inserts	9430 050 11501	
Epsilon 3 ^X series, 32 mm	9430 042 11321	
Epsilon 3 ^X series, 41 mm	9430 042 07191	



Figure 1: Sample holders for Axios^{MAX}, Axios, Axios-FAST, MagiX, MagiX-FAST, PW240X, PW260X



Figure 2: Sample holders for Axios^{MAX}, Axios, Axios-FAST, MagiX, MagiX-FAST, PW240X, PW260X - Inverted



Figure 3: Epsilon 5 sample holders



Figure 4: CubiX-XRF sample holder



Figure 5: Venus sample holders



Figure 6: Venus sample holders - inverted



Figure 7: Epsilon 3^X series sample holders



Figure 8: MiniPal sample holder



Figure 9: Plastic inserts



Figure 10: Stainless steel inserts

Sample Changer Trays

Expand your sample throughput with additional trays for your sample changer.

Sample changer trays for Axios ^{MAX} and Axios	Part Number	Notes
Tray for 8 sample holders	9430 044 29081	Up to 8 trays + 1 monitor tray per instrument
Tray for 8 sample holders or samples without holders	9430 044 29001	Up to 8 trays + 1 monitor tray per instrument
Tray for 8 samples in steel rings	9430 050 10521	Up to 8 trays + 1 monitor tray per instrument
Tray for 10 samples, 41 mm	9430 050 10411	Up to 8 trays + 1 monitor tray per instrument
Tray for 12 samples, 32 mm	9430 050 10321	Up to 8 trays + 1 monitor tray per instrument
Tray for 21 samples, 25 mm	9430 050 10251	Up to 8 trays + 1 monitor tray per instrument
SPC/Monitor Tray (4 position)	9430 044 29041	Only 1 per instrument

Sample changer trays for Axios-FAST, MagiX, MagiX-FAST, PW240X* and PW260X*	Part number	
Tray for 12 sample holders or samples without holders	9430 025 41121	Up to 10 per instrument
Tray for 24 sample holders or samples without holders	9430 025 41241	Only 1 per instrument

* With VRC sample changer

Sample changer trays for Epsilon 5	Part number	
Tray for 8 sample holders	9430 050 10601	Up to 6 trays + 1 monitor tray per instrument
Tray for 8 samples in steel rings	9430 050 10521	Up to 6 trays + 1 monitor tray per instrument
Tray for 10 samples, 41 mm	9430 050 10411	Up to 6 trays + 1 monitor tray per instrument
Tray for 12 samples, 32 mm	9430 050 10321	Up to 6 trays + 1 monitor tray per instrument
Tray for 21 samples, 25 mm	9430 050 10251	Up to 6 trays + 1 monitor tray per instrument
SPC/Monitor Tray (4 position)	9430 050 60601	Only 1 per instrument

Sample changer cassettes for CubiX-XRF	Part number	
Cassette for 10 steel ring samples	9430 025 21101	
Cassette for 5 sample holders	9430 025 21051	

Sample tray for Epsilon 3 ^X series	Part number	
10 position sample changer tray	9430 042 31001	

Sample changer tray for Epsilon 3 ^X series	Part number	
12 position sample changer tray without sample spinner	9430 040 29001	Non spinning
12 position sample changer tray with sample spinner	9430 040 31101	

Sample Storage Containers

Sample Storage Containers	Part number	
Sample storage containers, 38 mm x 15 mm	9200 130 09461	Set of 100
Sample storage containers, 45 mm x 16 mm	9200 130 09451	Set of 100
Storage box for containers	9200 130 09471	125 position



Figure 11: 5 position sample cassette for CubiX-XRF



Figure 12: 10 position sample cassette for CubiX-XRF



Figure 13: 12 position sample changer tray for Axios-FAST, MagiX, MagiX-FAST, PW240X and PW260X (samples not included)



Figure 14: Sample changer tray for Epsilon 3^X series

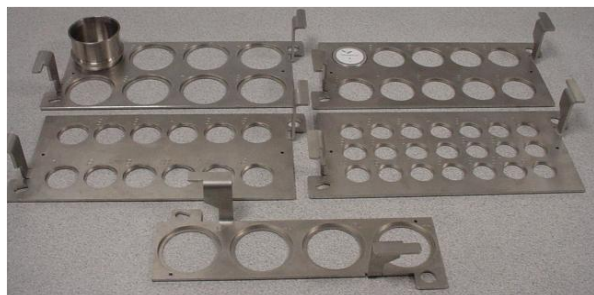


Figure 15: Sample Changer trays for Epsilon 5

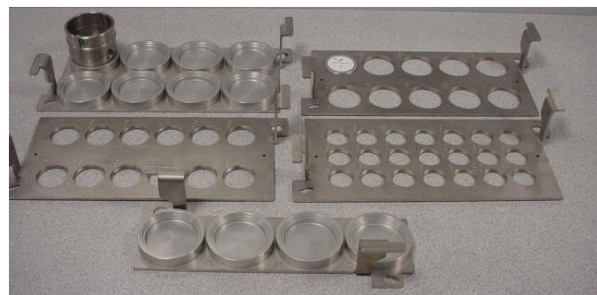


Figure 16: Sample changer trays for Axios^{MAX} and Axios

Preparation of Liquids and Loose Powders

PANalytical offers a wide range of sample holders and consumable items for the analysis of liquids and loose powdered material by XRF, including films, sample cups and assembly tools designed for trouble free assembly of liquid sample cups with a variety of support films.

Support films

When analyzing liquids and loose powders by XRF there are a variety of support films to choose from and the best choice will depend on your specific application requirements (figure 17).

PANalytical offers a range of films for various analytical purposes. All films are used in our application labs and our recommendations for using film for various applications are based on the experience of our application specialists with these products.

The support films offered by PANalytical include the four major film types, Polypropylene, Hostaphan®, Mylar® and Kapton®.

Polypropylene

Polypropylene is a high transmission film that has a relatively low tensile strength and generally weak chemical resistance, but is usually very clean for most contaminants. It can be used where low P and Ca measurements are important. For instance, it is commonly used for energy dispersive instruments that have lower resolution than WDXRF instruments and thus can encounter analytical problems with Ca and P overlaps that would be present when using Mylar film. PANalytical offers an ultra-low sulfur version of Polypropylene that can be used for low level sulfur analysis.

Mylar®

Mylar is a specific type of polyester film patented by DuPont that is an excellent general purpose film for many XRF applications. It has excellent tensile strength and is chemically resistance to most acids. Mylar does contain some contaminants such as P and Ca. Specific ultra-low sulfur versions are excellent for petrochemical applications such as ultra low sulfur analysis.

Selecting a Support Film

When choosing a support film several factors should be considered, including film absorption, film strength, and chemical resistance and film contamination.

Once X-rays are created in your sample, they must pass out of the sample and through the support film before they can be measured by the detector. The support film will attenuate or absorb the outgoing radiation to some degree which has an impact on the sensitivity of various elements, particularly those with longer wavelengths such as sodium. The two main factors that effect sensitivity are film type and or film thickness. Polypropylene typically has the highest transmission, or least absorption, followed by Mylar. The thickness of the support film also has an impact, with the thinnest films providing the best transmission or least absorption.

Film strength and chemical resistance are determined by the film type and thickness. Mylar has the strongest followed by Polypropylene.

Many films have inherent contamination which can impact your choice of films. The PANalytical films were tested with our Axios Advanced WDXRF spectrometer using our Omnia Application and the relative proportions of contaminants detected are shown in table 4. The support films offered by PANalytical are shown in table 5.

Element	Mylar	Polypropylene
Si	No	Yes (+)
P	Yes (+++)	NO
Cl	Yes (++)	NO
Si	No	Yes (+)

Table 4: Relative concentrations of contaminants measured in PANalytical brand films "+++"
Highest contamination found for this element, "+" Lowest Contamination found for this element,
No: No contamination found for this element.

PANalytical Brand Support Films

Film Type	Part Number	Thickness	Description	Recommended	Notes
Mylar®	9200 130 07831	1.5 µm	1000 pre cut sheets (76mm X 76mm)	45 mm	
Mylar®	9200 130 07791	2.5 µm	1000 pre cut sheets (76mm X 76mm)	45 mm	
Mylar®	9200 130 07741	3.5 µm	1000 pre cut sheets (76mm X 76mm)	45 mm	
Mylar®	9200 130 07751	3.5 µm	1000 pre cut circles (63.5mm in diameter)	35 mm	
Mylar®	9200 130 07691	3.5 µm	100 pre cut circles (76mm in diameter)	45 mm	
Mylar®	9200 130 07471	3.5 µm Low Sulfur	100 pre cut circles (76mm in diameter)	35 mm	
Mylar®	9200 130 08041	3.5 µm Low Sulfur	500 Pre cut circles (88.9mm in diameter)	45 mm	Larger diameter film recommended for most petrochemical applications
Mylar®	9425 888 00028	6.0 µm	500 pre cut sheets (76mm X 76mm)	45 mm	
Mylar®	9200 130 07121	6.0 µm	500 pre cut circles (63.5mm in diameter)	35 mm	
Mylar®	9425 888 00064	6.0 µm	100 pre cut circles (76mm in diameter)	45 mm	
Polypropylene	9425 888 00029	4.0 µm	500 Pre cut circles (63.5mm in diameter)	35 mm	
Polypropylene	9200 130 07821	4.0 µm	1000 pre cut sheets (76mm X 76mm)	45 mm	
Polypropylene	9425 888 00037	4.0 µm	110 Pre cut circles (76mm in diameter)	45 mm	
Polypropylene	9425 888 00039	6.0 µm	100 Pre cut circles (76mm in diameter)	45 mm	
Polypropylene	9425 888 00038	6.0 µm	500 Pre cut circles (63.5mm in diameter)	35 mm	
Polypropylene	9200 130 07911	4.0 µm	1000 Pre cut circles (63.5mm in diameter)	35 mm	
Polypropylene	9425 888 00034	4.0 µm Low Sulfur	500 Pre cut circles (63.5mm in diameter)	35 mm	

Table 5: Support films offered by PANalytical.

Liquid Sample Cups and Sample Holders

PANalytical offers a range of disposable sample cups for the analysis of liquids and loose powders. Each sample cup is comprised of three pre-cut and individually bagged pieces for easy assembly. All sample cups are vented and have an overflow reservoir in the lid (figure 19). The two most common sample cups are the 35mm and 45mm cups. The 35mm cups are ideal for use with the Epsilon 3X series of instruments but can also be used with the Axios, PW2400 and MagiX instruments in conjunction with the 35mm stainless steel sample holder (part number 9430 044 27951), or with the Epsilon 5 using the stainless steel sample holder (part number 9430 050 02321)(figure 22 and table 6).

The 45mm sample cups are primarily used with the Axios, Venus and Epsilon 5 instruments and fit into the respective sample holders for liquid analysis for these instruments (table 6). PANalytical also offers assembly tools for both 35mm and 45mm sample cups to insure easy and uniform assembly of the sample cups (figure 20). The complete list of sample cups and holders are shown in table 6.

Pre-assembled Sample Cups

PANalytical now offers pre-assembled sample cups with in 2 sizes with a variety of films. The pre-assembled cups are designed to make routine analysis easier and limit sample leaks in fast paced lab environments where many operators are preparing samples. The pre-assembled cups are packaged in cases containing either 768 cups/case for 45 mm cups or 1152 cups/case for 35 mm cups.



Figure 19: left: 35mm sample cup shown in the three individual pieces prior to assembly. right: 35mm cup assembled and ready for sample introduction

Sample holders and cups for the analysis of liquids and loose powders.

Sample Holders and Cups	Part Number	Description
45mm sample cups for liquids and loose powders (P2)	9200 130 09851	Bag of 100 cups (45mm in diameter)
45mm sample cups for liquids and loose powders (P2) with extra vent holes	9430 500 00671	Set of 1000
35mm sample cups for liquids and loose powders (P1)	9425 888 00024	Bag of 100 cups (35mm in diameter)
Sample cups for volatile liquids (Venus XRF only)	9430 500 00621	Set of 100
Assembly tool for 45 mm sample cups	9430 044 26001	1 Assembly Tool
Assembly tool for 35 mm sample cups	9430 040 27001	1 Assembly Tool
Sample holder for 45mm sample cups for Axios, MagiX, PW 2400 and PW 2600 series instruments	9430 044 27941	1 Sample Holder
Sample holder for 35mm sample cups for Axios, MagiX, PW 2400 and PW 2600 series instruments	9430 044 27951	1 Sample Holder
Sample holder for 45mm sample cups for the Epsilon 5	9430 050 02421	Set of 4 sample holders
Sample holder for 35mm sample cups for the Epsilon 5	9430 050 02321	Set of 4 sample holders
Sample holder for 45mm sample cups for the Venus	9430 040 21371	Set of 4 sample holders
Sample holder for 45mm sample cups for the Venus, volatile liquids	9430 040 21501	Set of 10 sample holders
Sample holder for 35mm sample cups for the Epsilon 3 ^X series	9430 040 29101	1 Sample Holder with Inserts
Sample holder for 35mm sample cups for the Epsilon 3 ^X series with sample spinner	9430 040 31101	1 Sample Holder with Inserts
Pre-assembled sample cups		
45 mm cups, 89 mm diameter, 3.5 µm low sulfur Mylar film (high flush lids)	9200 130 09891	1 Case of 768
45 mm cups, 89 mm diameter, 6 µm low sulfur Mylar film (high flush lids)	9200 130 09861	1 Case of 768
45 mm cups, 89 mm dia., 4 µm low sulfur polypropylene film (high flush lids)	9200 130 09871	1 Case of 768
45 mm cups with 89 mm diameter, 5 µm polypropylene film	9200 130 09361	1 Case of 768
45 mm cups, 89 mm diameter, 3.5 µm low sulfur Mylar film	9200 130 08631	1 Case of 768
45 mm cups, 89 mm diameter, 6 µm low sulfur Mylar film	9200 130 08671	1 Case of 768
45 mm cups, 89 mm dia., 4 µm low sulfur polypropylene film	9200 130 09111	1 Case of 768
35 mm cups with 89 mm diameter, 3.5 µm low sulfur Mylar film	9200 130 08681	1 Case of 1152 pre-assembled cups
35 mm cups with 89 mm diameter, 3.5 µm low sulfur Mylar film	9200 130 10001	Box of 192 pre-assembled cups
35 cups with 89 mm diameter, 6 µm low sulfur Mylar film	9200 130 08961	1 Case of 1152 pre-assembled cups
Other film type are available upon request		

Table 6: details of PANalytical sample cups and holders for the analysis of liquids and loose powders.

Preparation of Fused Beads



PANalytical supplies a range of basic fusion fluxes that can be used for a wide range of applications. The fluxes are all pre-fused and re-ground into large granules to eliminate problems caused by differences in the loss on ignition between different batches of flux which will impact your analyses. Lithium Tetraborate is the most common and most versatile flux that is used for a wide range of materials including cement, geological materials and slags (figure 23).

Lithium Metaborate is a flux with a low melting temperature that should only be used for specialty XRF applications or fusions for ICP Analysis as it does not easily cast into XRF disks without crystallization. The mixed 50% Lithium Tetraborate/ 50% Lithium Metaborate flux is a specialty flux that maintains the good casting characteristics of the Lithium Tetraborate flux, but allows complete dissolution of samples at lower temperatures. This flux is ideal where low fusion temperatures are required to prevent volatilization of elements such as S and halogens. The details of the fluxes offered by PANalytical are shown in table 7. An example of fusion beads of geological materials prepared with the PANalytical brand Lithium Tetraborate flux are shown in figure 24.

Fusion Fluxes

Flux	Part Number	Description	Applications
Lithium Tetraborate	9425 888 00033	2Kg container of Lithium Tetraborate flux for general purpose applications. Ideal for PANalytical application solutions including CemOxi or WROXI.	General purpose for most applications. Ideal for PANalytical Application Solutions including WROXI and CemOxi
Lithium Metaborate	9425 888 00046	2Kg Container of Lithium Metaborate Flux	Generally only for ICP fusions
50% Lithium Tetraborate 50% Lithium Metaborate Mixed Flux	9425 888 00032	2Kg Container of 50/50 mixed Lithium Tetraborate/ Lithium Metaborate Mixed Flux	Used for specialty applications where lower fusion temp is required
66% Lithium Tetraborate 34% Lithium Metaborate	9430 500 73781	2Kg Container of 66/34 mixed Lithium Tetraborate/ Lithium Metaborate Mixed Flux	
35% Lithium Tetraborate 65% Lithium Metaborate	9430 500 73801	2Kg Container of 35/65 mixed Lithium Tetraborate/ Lithium Metaborate Mixed Flux	
Ammonium Iodide release agent tablets	9430 500 73571	Bottle of 1000 tablets. Average weight of 21.4 mg (±1 mg)	

Table 7: Details of fusion fluxes offered by PANalytical.

Preparation of Pressed Pellets

Binders

Pellet Blend Binder

The pellet blend binder is a low moisture (44u) binding and grinding formulation additive, successfully utilized with samples that exhibit hard to abrasive characteristics with inhomogeneous sample materials. Pellet Blend has a well-balanced blend of self-binding properties along with grinding abrasiveness and can withstand moderate to high grinding cycles without degradation from heat.

This binder is chemically clean and ideal for most pelletizing applications including cements, slags and geological materials. This is the binder most used and recommended by our application specialists. This binder is also most commonly used to make pellets using 12g of sample and 3g of binder for Pro Trace and general analysis (figure 25).

MultiMix Binder

The MultiMix is a low moisture (<30u) wax based select mixture. Successfully utilized with samples that exhibit moderate to hard properties including some homogenous and many inhomogeneous sample materials. A highly lubricous additive, MultiMix has excellent self-binding properties with adequate grinding abrasiveness during short to moderate grinding cycles without degradation from heat.

Boric Acid Binder

A select granular grade of boric acid material able to withstand extreme high temperatures incurred during the grinding process of very hard and inhomogeneous sample materials. Boric acid is ideal as a backing agent used when making pressed pellets where sample size is limited.

Additional Items for the Preparation of Pressed Pellets

PANalytical also offers press dies for pressing 32 and 40mm pellets (figure 11), Aluminum backing support cups for 32 and 40mm pressed pellets as well as pellet film to prevent materials from sticking to the press die during preparation of the pressed pellets (figure 28). The details of the products available for preparing pressed pellets are shown in table 8.



Figure 23: Container of 500, 0.5g tablets of Pellet Blend Binder and Container of 1lb of Pellet Blend Binder.

Consumables for the preparation of pressed pellets

Item	Part Number	Description	Notes
Pellet Blend Binder	9425 888 00027	1 lb. bottle of powder	For most applications for hard to abrasive materials
Pellet Blend Binder	9200 130 07781	Bottle containing 500, 0.25 g tablets	
Pellet Blend Binder	9200 130 07711	Bottle containing 500, 0.5 g tablets	
Boric Acid Binder	9200 130 07771	500 g bottle of powder	For binding or backing pressed powders
MultiMix Binder	9425 888 00043	Bottle containing 500, 0.25 g tablets	For materials with moderate to hard properties
MultiMix Binder	9425 888 00067	Bottle containing 500, 0.5 g tablets	
Elvacite Sample Binder	9200 130 07061	200 g bottle of powder	Acrylic binder
Brickettblend Sample Binder	9425 888 00042	250 g bottle of powder	Excellent choice for iron ore, slag and magnesite materials. Suitable for milling moderate to hard inhomogeneous materials. 250 gram bottle
Press Die Set	9425 888 00030	Die for pressing 32 mm diameter pellets	
Press Die Set	9425 888 00031	Die for pressing 40 mm diameter pellets	
Replacement Pellets for Press Die Set	9200 130 07801	2 polished replacement pellets for 32 mm die set	
Replacement Pellets for Press Die Set	9200 130 07811	2 polished replacement pellets for 40 mm die set	
Aluminum Backing Cups for Pressed Pellets	9425 888 00025	1000 aluminum backing cups for 32 mm pressed pellets	
Aluminum Backing Cups for Pressed Pellets	9425 888 00026	600 aluminum backing cups for 40 mm pressed pellets	
Pellet Film	9200 130 07721	500 pre-cut circles for 32 mm pellets	
Pellet Film	9200 130 07731	500 pre-cut circles for 40 mm pellets	

Table 8: Details of the consumables for pressing pellets offered by PANalytical.



Figure 24: Example of pressed pellets prepared using 120 g of sample and 3 g of Pellet Blend Binder



Figure 25: 32 mm die assembly for pressing 32 mm pellets

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Global and near

