



Dosing, Cleaning and Fusion QCX[®] DCF820/830

The DCF820/830 Dosing, Cleaning and Fusion device produces fused beads for X-ray fluorescence (XRF) analysis in robotics setups. It is suitable for use with all granular materials with particle size around 100 micron or less that can be dissolved by borate fusion. This includes geological samples and cementitious materials in particular.

DCF820/830 is a completely automated solution. Full automation of all required operational steps removes health and safety risks for your laboratory personnel by avoiding personal exposure to potential harmful materials.

Automation also eliminates human factors that place limitations on accuracy during sample and flux dosing, homogenisation of the material, and cleaning of the crucibles. Not only does this improve efficiency, it frees laboratory staff to be utilised for more demanding tasks and also reduces the consumption of chemicals, therefore reducing operational costs. Further, the fully bidirectional data transmission overcomes errors in the analytical recipes and therefore guarantees high quality analytical results.

Advantages

- Accuracy: the DCF820/830 offers the most reliable heating and precise dosing. This in turn gives you absolutely optimal results for XRF analysis.
- Efficiency: with each stage automatically transitioning to the next, and all recipes mixed perfectly every time, your analytical processes will be substantially faster with no compromise on accuracy.
- Automation: the DCF820/830 is part of our QCX solutions. It is purposefully designed for seamless integration, so installation and future upgrades are effortlessly achieved with minimal disruption.

A multi-stage solution for unbeatable XRF analysis

How it works

The DCF820/830 device is designed to operate in a robot automated laboratory.

Fused beads for XRF analysis are first prepared in a muffle furnace. Along with the robot, the DCF820/830 device is then able to proceed with gravimetric dosing and mixing of flux and sample, as well as cleaning of the crucibles.

Compared to other methods, XRF analysis of fused beads is unaffected by analytical errors normally associated with mineralogy, segregation, or particle size effects. The precise, automated preparation technique ensures a homogenous matrix with an even distribution of analytes.

Automation of the dosing and weighing tasks ensures optimal reproducibility and analytical quality and increases the capacity of your laboratory. Automated fusion preparation is faster than the manual process and thus gives you faster access to data.

User-friendly setup means you can easily adjust dilution ratios and flux types from sample to sample according to tailored recipes. You can also adjust dosing accuracy in accordance with capacity requirements.

Possible configuration

The DCF820/830 device is purposefully designed for integration in robotics labs. Robotic intervention is required to transition samples through each stage of fusion, dosing, mixing, and cleaning. FLSmidth QCX provides ideal compatibility for the most seamless automation setup.



DCF830 with Robot

Specification

Type	820	830
Fusion instrument	1 x Eagon 2 Claisse	2 x Eagon 2 Claisse
Sample material	Dry, non-sticky, max. 5 % residue on a 105 micron sieve	
Flux material	Dry, crystalline, non-sticky	
Sample quantity	36 – 44 cm ³	
Sample frequency	8 beads/hour	16 beads/hour (this may vary with fusion time)
Flux capacity		
Standard	1 removable stainless steel container, 1,500 cm ³	
Option	2 independent containers, each 1,500 cm ³	
Sample dosing accuracy	< ±40 mg	< ±80 mg
Dilution ratio accuracy (sample / [sample + flux])	< ±0.15 %	< ±0.75 %
Weight of dosed sample	0.5 – 3.0 g	
Weight of dosed flux	0 – 10.0 g	
Bead diameter	32 or 40 mm	
Furnace temperature	300°C – 1,200°C	
Crucible cleaning reagent	Tickopur R27 (5 % solution), Citric acid (5 – 10 % solution) or equivalent	
Crucible cleaning method	Heated, ultrasonic bath with cleaning reagent with subsequent washing by tap or distilled water, hot air drying	
Washing water	Tap or/and Distilled water, 0.15 – 0.6 MPa	
Dedusting	0.5 m ³ /min, -16 to -31 kPa	
Exhausting	0.056 m ³ /s	0.102 m ³ /s
Power supply		
Line 1	230 V; 50/60 Hz, max. 1.8 kW	
Line 2	230 V; 50/60 Hz, max. 4.6 kW	
Line 3	– 230 V; 50/60 Hz, max. 4.6 kW	
Compressed air supply	0.6 – 1.0 MPa (Quality 1.4.1 as per ISO 8573-1)	
Operating conditions	Temperature: 15°C to 25°C Humidity: 20 – 80 %	
Weight	Approx. 565 kg	Approx. 710 kg
Dimensions (W x D x H)	930 x 1,010 x 2,000 mm	1,660 x 1,010 x 2,000 mm