IBS Fertigungs- und Vertriebs-GmbH

IBS GERMANY PRODUCT

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WS 22 High Precision Wire Saw

Application and Configuration

The *WS 22* wire saw has been developed to meet two important requirements: cutting should not introduce deformations or defects, and losses of the material should be minimized. These two requirements have been met by the development of an improved cutting technology which utilizes the precision guidance of a wire and uniform application of the abrasive slurry. The saw is semiautomatic and requires no supervision during its operation.

The saw can be used for precision cuts on semiconductors, ferrites, metals, glass, as well as many other solids, including very hard or brittle ones.

The wire saw enables cutting of very thin slices (down to thickness of 50µm) with smooth cut surfaces (surface roughness does not exceed 1µm). The *WS 22* saw is particularly recommended for cutting materials where minimal material losses and high surface demands are important. When using the thinnest wire (40µm diameter), and proper abrasive powder grid sizes, material losses do not exceed 70 µm on average.

The obtained slices are perfectly parallel, thus additional lapping is unnecessary. Cutting under any desired angle is possible due to the rotational capability of the sample holder. Use of special accessories (goniometers, orientation devices) extends the *WS 22* saw´s application to precision cutting of crystallographically oriented crystals.

General Characteristics

A thin tungsten wire, moistened with an oil- or glycerine suspended abrasive slurry, is used during the cutting process. This slurry is applied continuously to the cutting area. The wire moves rapidly back and forth in an oscillatory motion. A high accuracy of cuts is guaranteed because of the following features:

1. The sample is in a oscillatory motion around the axis perpendicular to the cutting plane.
2. The saw wire slides on two guide bars which move in tandem with the swinging motion.
3. The wire load on the sample is precisely controlled.
4. To prevent wire wear, new wire is fed continuously to the cutting area.

The cutting speed depends mainly on wire load, sample hardness, sample shape, and for such materials as Ge, InSb, HgTe, GaAs, etc. is approximately between 1 to 3 cm^2/h. The *WS 22* saw is equipped with a horizontal sample carriage mechanism of high precision. A displacement of the sample by +/-30mm (deviation less than 0.002mm) is possible. The sample holder can rotate around the vertical axis and be fixed in any desired position.

The saw is equipped with an automatic switch-off (AUTO-STOP) which turns the saw off when the cutting wire is torn, the cutting process is completed, or the desired cutting depth is achieved. The saw is also equipped with a magnetically driven mixing device, by means of which the cutting slurry is being batched. Mixing and batching procedures are automatically controlled by an electronic system which enables the drip frequency and time to form a drop (dependent on the viscosity and density of the slurry) to be programmed.

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Technical Data:

Power requirement:	240V AC / 50 Hz - 110V AC / 60 Hz
Wire diameter available:	40, 50 and 60 µm
Wire oscillation frequency:	300 or 400/min
Weight:	WS 22 - 48 kg / WS 22B - 65 kg
Dimensions:	WS 22 60 x 35 x 40 cm (WxDxH) WS 22B 60 x 55 x 40 cm (WxDxH)
Max. sample sizes:	WS 22 - 40mm dia. WS 22B - 80mm dia.
Max. sample weight:	WS 22 - 150 g WS 22B - 2000 g

Order Information:

a. *WS 22*

b. *WS 22B*

c. Standard Spares Kit consisting of the following consumables:

- 1 liter of glycerin,
- container with 400g of carborundum powder mesh 800
- set of wire guide bars
- spare sample holder
- spare driving belt
- pawl spring
- pawl
- set of felt cleaners for the wire
- instruction manual

d. delivery, set up and customers training for max. 1 manday

Optional Equipment

1.	WS G01	Goniometer for model WS 22
2.	WSXC 22	Goniometer without Laue-screen, but with base to be used with WS 22B
3.	WSXD	WS 22 - mounting-adapter for the Huber Goniometerhead 1005
4.	WSXC 20/32	Optical orientation device based on optical bench, diode laser screen and Goniometerheads WS G01 or WSXC 22
5.	MST 131	Stereo Microscopehead for placing the samples in a defined position to the wire for exact cuts, incl. bench