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DIASPEC\_SPS\_2-8\_D\_03.DOC

## **FLOW SORT DIAMOND RECOVERY MACHINES**

### **TECHNICAL SPECIFICATION FOR SINGLE PARTICLE SORTER MODELS**

# **XR 2/8 D SPS & 10/25 D SPS**

## **GENERAL**

Our single particle sorter concept stems from one of Wolf's machine designs from the mid 1970's.

The quad channel feeding system is based on achieving particle singulation with spiral bowl feeders (utilising a unique patented discharge lip) followed by gravitational particle separation.

Diamond detection is by means of a highly stabilised x-ray source and optic fibre coupled photo multipliers.

Diamond separation is done by high speed electro mechanical ejectors which are designed to remove individual particles from the feed stream.

The sorters 4 channels are set up for specific 2:1 particle size ranges. Optimal set-up is achieved by interchangeable feeder bowls and ejector rotors.

Note that the sorter can be set-up to simultaneously sort a different size material at each of the 4 channels.

## **ELECTRIC SUPPLY:**

**STANDARD:** 220 Volt (+/- 10%), 50 Hz, Single Phase  
Power consumption approx. 3kVA,

**OTHER SUPPLY:** ON REQUEST.

## **X-RAY TUBE COOLING WATER SUPPLY:**

**QUALITY:** Only potable water may be used.

**PRESSURE:** Not be less than 400 kPa and not exceeding 800 kPa.

**VOLUME:** Water flow rate at 400 kPa is approx. 4.0 litres per min.

**TEMPERATURE:** Inlet Temperature max. 28 °C

## **SORTING PARAMETERS OF SPS SORTER MODELS**

FLOW SORT SINGLE PARTICLE SORTERS (SPS) are available with a SMALL feed assembly with designation **XR 2/8 D SPS** or with a LARGE feed assembly with designation **XR 10/25 D-SPS**.

### **FEED ASSEMBLY “SMALL” XR 2/8 D SPS**

**MINIMUM SIZE:** The minimum size is 1mm  
The recommended minimum is 2mm.

**MAXIMUM SIZE:** The maximum size is 10mm  
Recommended maximum is 8mm.

**SIZE RATIO:** Maximum ratio of particle size in feed is 2:1.

### **RECOMMENDED SPLITS ARE:**

FEED ASSEMBLY SMALL: + 1mm - 2mm  
+ 2mm - 4mm  
+ 4mm - 8mm

### **FEED ASSEMBLY “LARGE” XR 8/25 D SPS**

**MINIMUM SIZE:** The minimum size is 6mm  
The recommended minimum is 8mm.

**MAXIMUM SIZE:** The maximum size is 35mm  
Recommended maximum is 25mm.

**SIZE RATIO:** Maximum ratio of particle size in feed is 2:1.

### **RECOMMENDED SPLITS ARE:**

FEED ASSEMBLY LARGE: + 8mm - 16mm  
+ 16mm - 20mm

**FEED RATE:** The maximum feed rate per hour “FR” is computed by using the following approximation:

$$\text{FR (in kg/h)} = 0.4 \times d^2 \times \text{SF} \times \text{S.G.}$$

SF = “SHAPE FACTOR” i.e. The particle volume expressed as a portion of the volume of a sphere with average particle diameter. (i.e. 60% of volume of a sphere results in a “SHAPE FACTOR” = 0.6)

d = AVERAGE PARTICLE DIAMETER ( in mm)

S.G. = AVERAGE SPECIFIC GRAVITY OF FEED MATERIAL

**CONCENTRATION:** Concentration of ejected particles is higher than 98%.

Note that these sorters are designed to eject either the luminescent particles or the non-luminescent particles present in the feed material.

**DIMENSIONS:** Refer to GENERAL Arrangement Drawing **SPS\_GA\_03.DWG**

**MASS:** \_\_\_\_\_  
Sorting machine complete.....**600 kg.**  
Electric control panel .....**120kg.**

**TRANSPORT CRATE DIMENSIONS:** Depending on mode of transport and final destination.

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