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TECHNICAL SPECIFICATION

FLOW X-RAY DIAMOND RECOVERY CONTAINER

- HIGH SECURITY:** LOCKABLE STEEL CONTAINER WITH REMOTE CONTROLLED CAMERA SURVEILLANCE SYSTEM
- HIGHLY TRANSPORTABLE:** CAN BE MADE READY TO TRANSPORT OR SET-UP FOR OPERATION WITHIN 3 HOURS!
- PEACE OF MIND OPERATION:** CAN BE FITTED WITH A REMOTE SORTER / PLANT CONTROL AND MONITORING SYSTEM

CONTAINERISED FLOW X-RAY DIAMOND RECOVERY PLANTS are specifically designed to sort WET (or DRY) diamondiferous material.

FLOW offers containerized X-ray recovery plants fitted with one or two **SINGLE STAGE MODELS** coded as **XR 2/50 DW** or alternatively fitted with one or two **TWIN-STAGE MODELS (double pass sorters)** labelled **TSXR 2/50 DW**.

Our container plant design follows the same robustness, reliability, high recovery efficiency, easy operation and low maintenance concept, as well as our uncompromising after sales service that earned our products acceptance in the market place.

Optionally FLOW X-RAY X-RAY DIAMOND RECOVERY CONTAINER PLANTS can be supplied with an integral diesel generator power-plant, sufficiently sized to not only supply the electric power to all the container plant components but with some 5 kVA extra for powering some auxiliary plant equipment.

A low voltage (12 Volt solar charged) power back-up system comes standard with our container X-ray plants. This provides uninterrupted power for the containers emergency lighting as well as the sorters remote monitoring system (if fitted) and camera system (if fitted) as well as the containers communication links.

EXTERNAL ELECTRIC SUPPLY SPECIFICATION:

- Standard XR:** 380 Volt (+/- 10%), 50 Hz, 3 Phase + Neutral, + Earth.
Power consumption approx. 3kVA.
- Standard TSXR:** 380 Volt (+/- 10%), 50 Hz, 3 Phase + Neutral, + Earth.
Power consumption approx. 4kVA.
- General Container:** 380 Volt (+/- 10%), 50 Hz, 3 Phase, Neutral, Earth.
Power consumption approx. 2kVA.

Other Electrical Supply Specifications (Voltage, Frequency) can be accommodated on request.
Lightning protection, surge and phase failure protection, are standard on all FLOW container plants.

INTERNAL ELECTRIC SUPPLY (OPTIONAL):

FLOW CONTAINER PLANTS CAN BE SUPPLIED WITH a 3 Phase, 15 kVA, Diesel Generator Set making the unit totally independent from any external power source.

EXTERNAL WATER SUPPLY SPECIFICATION:

- QUALITY:** Water supply must be filtered through a 100 Micron filter.
- PRESSURE:** Water supply pressure must not be less than 400 kPa and not exceed 800kPa.

TEMPERATURE: MIN: +2.5°C MAX: +30°C
Volume PER XR-: Typically 15 litres / min. Water flow rate (volume) however varies depending on feed-rate, material size and type of material to be sorted.
Volume PER TSXR-: Typically 25 litres / min. Water flow rate (volume) however varies depending on feed-rate, material size and type of material to be sorted.

PARTIAL EXTERNAL WATER SUPPLY SPECIFICATION:

FLOW container plants are fitted with an internal water re-circulation system designed to minimise water consumption of the container plant.

If this “water safe” mode is selected (via internal valves) the containers water consumption will be reduced to approximately 10% (ten percent) of the FULLY EXTERNAL WATER SUPPLY OPTION.

OPERATING TEMPERATURE RANGE:

CONTAINER INTERNAL TEMP: MIN: +2.5°C MAX: +45°C
RELATIVE HUMIDITY: 95% non-condensing

Note that our container plants are fitted with air-conditioning and ventilation units!

FEED MATERIAL SPECIFICATIONS:

MODELS XR 2/50 DW & TSXR 2/50 DW

Min SIZE for XR- & TSXR- 2/50DW: There is no minimum size limit!
Recommended minimum is 2mm.

Max SIZE for XR- & TSXR- 2/50DW: Recommended maximum is 42mm.

Absolute maximum is 50mm

No particle may exceed 50 mm in any dimension.

PARTICLE SIZE RATIO:

For maximum recovery efficiency we recommend a size ratio of 2:1 for material below 4mm and up to 3:1 for material above 3mm.

RECOMMENDED SIZE FRACTIONS:

FLOW SORT OFFERS A PROFESSIONAL CONSULTING SERVICE TO ADVISE ON OPTIMAL SIZE SPLITS FOR SPECIFIC APPLICATIONS.

TYPICAL SPLITS for XR-2/50 DW & TSXR- 2/50 DW are:

4 fractions: + 2mm – 4mm, + 4mm – 10mm, + 10mm – 22mm, + 22mm – 42mm

3 fractions: +2mm – 5mm, +5mm – 12mm, +12mm – 32mm

FEED MATERIAL PRESENTED TO THE SORTERS MAY BE WET OR DRY. IT IS HOWEVER IMPORTANT THAT THE MATERIAL IS “CLEAN” i.e. FREE OF CLAY, SLIME, VEGETATION OR OTHER FOREIGN OBJECTS.

THE MATERIAL TO BE SORTED MUST BE APPROPRIATELY SIZED AND FREE OF UNDERSIZED AS WELL AS OVERSIZED MATERIAL.

FLOW SORT CONCENTRATE BINS

FLOW CONTAINER PLANTS ARE SUPPLIED WITH 2 (TWO) SPECIAL HIGH SECURITY CONCENTRATE BINS (THAT FIT DIRECTLY ONTO THE SORTERS CONCENTRATE OUTLETS) PER SORTER STAGE.

FEED RATE SPECIFICATIONS FOR PRIMARY FEED MODELS XR-2/50 DW & TSXR-2/50 DW

Sorter feed rate per hour “FR” is computed by using the following approximations:

For primary recovery: $FR \text{ (in kg/h)} = 150 * d \text{ (in mm)} * SF * s.g.$

d = AVERAGE PARTICLE DIAMETER (IN A GIVEN SIZE FRACTION) in mm

150 = SORTER CONSTANT for primary recovery machines

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

s.g. = AVERAGE SPECIFIC GRAVITY OF FEED MATERIAL (g/cm³)

For a simplified “RULE OF THUMB” feed rate calculation for a Primary Recovery XR- or TSXR-machine (assuming “NORMAL” shaped material (SF ± 0.6) with a s.g. of ± 2.7) use:
FR (kg/h) ≈ 230 * d(mm). I.e. **230 times the value of the average particle diameter (in mm)**
For example a sorter will handle 1150kg/h of material with an average specific gravity of 2.7 and an average particle size of 5mm.

YIELD:

YIELD of primary recovery machines:

Each ejection produces concentrate equivalent to approximately

12 * FR (kg/h) * 10⁻⁶ or

0.0012% of FR (kg/h)

If for example a sorter is treating 1000kg/h then each ejection will deflect approx. 12 gram of feed material (including the diamond that triggered the ejector) to concentrate.

RECOVERY EFFICIENCY:

Theoretical diamond recovery efficiency figures depend on many factors such as feed rate, feed material particle size ratio and feed material temperature, cleanliness of feed material, colour, impurities and nitrogen content of diamonds etc.

In practice however with over 500 FLOW SORT machines operating around the world, we are proud to say, we have never encountered a case where actual diamond recovery efficiency of a properly set-up and maintained sorter was below 98 percent! When basing diamond recovery on value rather than number, diamond recovery efficiency figures run very close to 100 percent!

FLOW SORT OFFERS A DIAMOND FLUORESCENCE EVALUATION SERVICE, GEARED TO DETERMINE EXACTLY WHAT RECOVERY EFFICIENCY CAN BE EXPECTED IN SPECIFIC SORTER APPLICATIONS.

DIMENSIONS OF FLOW CONTAINER PLANT:

TRANSPORT DIMENSIONS OF A FLOW SORT CONTAINER PLANT ARE IDENTICAL TO THE INTERNATIONAL STANDARD OF A 6m (TWENTY FOOT) SHIPPING CONTAINER:

NOTE: No additional packaging is required for shipping of a FLOW container plant.

WEIGHT OF X-RAY CONTAINER PLANT:

The weight of a FLOW X-RAY CONTAINER PLANT varies greatly with plant configuration:

The “empty” container plant weighs in at about **2500kg**

Per XR sorter fitted add: **600kg**

Per TSXR sorter fitted add: **1000kg**

If fitted with a diesel generator-set add: **500kg**

FLOW SORT (PTY) LTD. RESERVES THE RIGHT TO REVISE THIS SPECIFICATION AND TO MAKE CHANGES FROM TIME TO TIME IN THE CONTENTS THEREOF WITHOUT OBLIGATION TO NOTIFY ANY PERSON OF SUCH REVISION OR CHANGES.



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Flow Sort

LEADERS IN DIAMOND RECOVERY TECHNOLOGY