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updated w concentrate bin maintenance

## RECOMMENDED MAINTENANCE FOR FLOW SORT X-RAY DIAMOND RECOVERY MACHINES

Please Note: Throughout this document “FLOW” shall mean Flow Electronics (Pty) Ltd and its subsidiary company Flow Sort (Pty) Ltd

### 1. GENERAL

- a. When servicing and or maintaining FLOW SORT X-RAY DIAMOND RECOVERY MACHINES it is of utmost importance to take into account that these machines use X-Ray radiation as well as very high voltage potentials.
- b. Only personnel adequately trained and qualified to service FLOW SORT X-RAY DIAMOND RECOVERY MACHINES may conduct any service tasks on these machines.
- c. **FLOW SORT X-RAY DIAMOND RECOVERY MACHINES being serviced by untrained personnel and / or using not approved parts and components in the repair or service of FLOW SORT X-RAY DIAMOND RECOVERY MACHINES, may not only lead to equipment malfunction but also to damage of the machines and even to injury or even death of personnel.**
- d. FLOW conducts regular service personnel training courses. FLOW Candidates who have attended such training course receive a certificate from FLOW stating which level of training they have passed and therefore what type of work they are authorized to. (Operating, Maintenance, Repair).
- e. Only use parts and components for any service and / or repair work on FLOW SORT X-RAY DIAMOND RECOVERY MACHINES
- f. Allowing untrained, not-certified persons to conduct any service or maintenance work or using non-approved parts on FLOW SORT X-RAY DIAMOND RECOVERY MACHINES is in contravention with the prevailing laws governing the usage of radiation emitting devices. This can lead to revoking a customer’s user license as well as possible legal action.

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## 2. SAFETY AND SECURITY

- a. Above all issues relating to the performance and efficiency of a FLOW SORT X-RAY DIAMOND RECOVERY MACHINES is their SAFETY
  - i. Rule No.1 Never ever work on a FLOW SORT X-RAY DIAMOND RECOVERY MACHINE without making 100% sure that there is NO ELECTRIC POWER connected. ISOLATE THE SORTERS CONTROL PANEL FROM THE MAINS SUPPLY and insure that unauthorized or unintentional re-connection of the sorter during service (maintenance) is not possible.
  - ii. Rule No.2 NEVER USE A SAFETY INTERLOCK OF THE FLOW SORT X-RAY DIAMOND RECOVERY MACHINE AS AN “ON / OFF” SWITCH.
  - iii. Rule No 3. Never ask anyone to check if THE POWER TO THE SORTER IS SWITCHED OFF, always check for yourself!

## 3. REFERENCE BASE FOR SERVICE WORK ON A FLOW SORT MACHINE

- a. When a FLOW SORT X-RAY DIAMOND RECOVER MACHINE is commissioned by a qualified FLOW technician a complete “SET-UP RECORD” is recorded. ATTACHED REFER TO
- b. This SET-UP record is to be adhered to at all times unless it is altered and properly recorded by a fully qualified and certified technician.
  - i. A sorters set-up record contains information, for each of the three pre-select positions, about:
    1. the X-ray current
    2. the X-ray voltage
    3. the channel sensitivity dial reading for the left channel
    4. the channel sensitivity dial reading for the right channel
    5. the feeder dial reading
    6. the left P.M. tube current ( $\mu\text{A}$ ) reading
    7. the right P.M. tube current ( $\mu\text{A}$ ) reading
    8. the feeder control gate opening in “mm”
    9. the material size
    10. the “inlet” water pressure
    11. the “feed” water pressure
    12. the X-ray “cooling” water pressure
    13. K45 filter installed or not
    14. K42 filter installed or not
    15. percentage of FLOW SORT TRACER recovery at a specific channel sensitivity setting and  $\mu\text{A}$  reading

## 4. DAILY CHECKS AND SERVICE

- 101 a. COMPARE the actual sorter settings against the SET-UP RECORDS as listed in  
102 3.b.i.1.to 3.b.i.12  
103  
104 b. RECORD the all (actual) sorter settings in the sorters LOG BOOK. ATTACHED  
105  
106 c. DO NOT MAKE ANY ADJUSTMENTS (CORRECTIONS) to any of the sorter  
107 settings without fully understanding why such adjustment has to be made. If in  
108 the slightest doubt consult with a FLOW machine expert.  
109  
110 d. RECORD any changes made with a clear reference to ‘why’, ‘when’ and by  
111 ‘who’s recommendation and / or instructions.  
112  
113 e. Check for any physical wear, damage, blockage, leaks etc. of the sorter itself; i.e.  
114 lamps, LED’s, printer-paper, printer ribbon meters, etc. as well as any connected  
115 components such as chutes, pipes, filters cables etc.  
116  
117 f. Back-wash water filters and clean / replace filter elements when necessary.  
118  
119 g. **KEEP SORTER CLEAN AT ALL TIMES**  
120  
121 h. **CONDUCT A TRACER TEST** compare results with 3.b.i.14 and record results  
122  
123

## 124 5. WEEKLY CHECKS AND SERVICE

- 125  
126 a. Check WINDOW FRAMES for wear and replace when necessary  
127  
128 b. Check EJECTOR GATES for wear and replace if necessary  
129  
130 c. Check EJECTOR BRAKES for proper friction setting  
131  
132 d. Check FEED CONTROL GATES for wear  
133  
134 e. Check/Clean OVER-FEED PROTECTION components  
135  
136 f. Check transfer chute liners in (TSXR machines only)  
137  
138 g. **Conduct a TRACER TEST** compare results with 3.b.i.14 and record results  
139

## 140 6. MONTHLY CHECKS AND SERVICE

- 141  
142 a. Check FEED SLIDES for wear and replace if necessary  
143  
144 b. Check EJECTOR SHAFTS and BUSHES for wear and replace if necessary  
145  
146 c. Check WATER DEFLECTOR(S)  
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## **7. EVERY TIME A CONCENTRATE BIN IS REMOVED**

- a. Clean the concentrate bin guide rails (bin support ball plungers)
- b. Check plungers and replace faulty ones
- c. Lubricate the clean rails with a water repellent lubricant spray such as Q20
- d. Clean concentrate bin lid after every bin opening
- e. Clean concentrate bin after every emptying

## **8. EVERY TIME AN EJECTOR IS REMOVED**

- a. Clean Ejector slides and gaskets
- b. Check Ejector gates for tightness
- c. Check Ejector gates for wear
- d. Check Ejector liners and frame for wear
- e. Check on models XR 35W and 50W the Ejector centre bush assembly for damage and wear. Replace if necessary.

## **9. EVERY TIME A WINDOW FRAME IS REPLACED**

- a. Clean window frame seat in feed slide
- b. Check Optic Box front gasket and replace if necessary
- c. Check Optic Box window film and replace if necessary
- d. Check micro-switch membrane for fatigue and damage
- e. Insure proper optic box insertion into feed slide
- f. Conduct a TRACER TEST compare results with 3.b.i.14 and record results.

## **10.EVERY TIME A FEED SLIDE IS REPLACED**

- a. Check all feed stabilizing curtains for wear and replace if necessary
- b. Ensure that there are no water leaks after replacing a feed slide
- c. Conduct a TRACER TEST compare results with 3.b.i.14 and record results.

200 **11.EVERY TIME THE PRINTER PAPER ROLL IS REPLACED**

- 201
- 202 a. Check status of the printer ribbon
- 203
- 204 b. Check the inside of the control panel for cleanliness
- 205
- 206 c. Check for any loose plug-in PC boards
- 207
- 208

209 **12.DO NOT SERVICE ANY COMPONENTS LOCATED UNDER**

210 **THE X-RAY COVER**

- 211
- 212 a. If a problem is encountered with any of the components inside the x-ray
- 213 compartment CALL AN OFFICIAL FLOW SERVICE AGENT for assistance.
- 214
- 215

216 **13.DO NOT SERVICE ANY COMPONENTS LOCATED UNDER**

217 **THE X-RAY GENERATOR COVER**

- 218
- 219 a. If a problem is encountered with the high voltage x-ray generator located under
- 220 the x-ray generator cover, CALL AN OFFICIAL FLOW SERVICE AGENT for
- 221 assistance.
- 222
- 223

224 **14.DO NOT SERVICE ANY PARTS INSIDE THE OPTIC BOX**

- 225
- 226 a. If a problem is encountered (suspected) with any of the components inside the
- 227 optic box, CALL AN OFFICIAL FLOW SERVICE AGENT for assistance.
- 228
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230 **15.DO NOT SERVICE ANY PARTS WITHIN THE SORTERS**

231 **CONTROL PANEL WITH THE EXCEPTION OF CHANGING,**

232 **PRINTER PAPER, PRINTER RIBBONS AND FUSES.**

- 233
- 234 a. If a blown fuse is replaced and it blows again DO NOT KEEP ON REPLACING
- 235 IT BUT CALL AN OFFICIAL FLOW SERVICE AGENT.
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- 237

Peter WOLF