

Solvent usage at Xaar Huntingdon manufacturing site - 2012

The two solvents used in manufacturing for surface cleaning are IPA and Acetone and the ratio of usage is 10:1 (IPA:Acetone) – Acetone usage increased from 16:1 due to new processes.

IPA booked from stores : 52,220 Litres [41,418 Kg]

Acetone booked from stores: 4,077.5 Litres [3,221.225 Kg]

Solvent collections : 51,810 Litres [40,411.8 Kg]

Fugitive = (1 – (Collection / Total booked)) * 100 % = 7.97%

FUGITIVE VALUE 7.94%

PERMIT LEVEL 20%

Results from Monitoring (2013: 2012: 2011)

Production levels – 2013 = 7K/month, 2012 = 4K/month

LEV	Location	<u>Checking for - SOLVENTS</u>	Checking Required	75mg/m ³ average	½ hr av. peak	Max
14	Back end assembly	Room extraction solvents 2012 readings 2011 readings	√	0.4 1.1 (0.6)	0.4 2.6 (1.8)	1.0 3.5
16	Validation Lab.	Room extraction – solvents	√	0.5	0.5	1.3
11	C.R. 3 Laser Stack	Possible exhaust from laser chambers clean room 3 – Fluorine	√	Trace level of F ₂ < 0.8 mg/m ³		
13	C.R. 3 room exhaust	Room extraction – solvents 2012 readings 2011 readings	√	9.7 0.3 (0.3)	11.5 0.5 (2.6)	35 0.6
10	C.R. 3 room exhaust	Room extraction from machining area – PZT water vapour from machining	√	Trace level of Pb and Z < 0.01mg/m ³		
5	C.R. 2 room exhaust	Possible exhaust from laser chambers clean room 3 – Fluorine	√	Trace level of F ₂ < 0.5 mg/m ³		
7	C.R. 2 Nitric flush	Extraction from Nitric flush rig	√	HNO ₃ measured at 0.04 mg/m ³		
9	C.R. 2 room exhaust	Room extraction – solvents 2012 readings 2011 readings	√	1.9 18.5 (8.3)	1.88 30.8 (14.9)	9.5 49.7
8	C.R. 2 area exhaust	Room extraction from machining area – PZT water vapour from machining	√	Pb measured at 0.03 Zirconium, trace < 0.01		
6	C.R. 2 Plating line 2	Extraction from plating line 2 – full range of acids	√	HCl 0.08, F ₂ < 0.01, HNO ₃ 0.33, H ₂ SO ₄ 0.01 Nickel < 0.01		

1	C.R. 1 room exhaust	Room extraction - solvents	√	29.1 0.2	40 0.2	123 0.2
3	C.R. 1 laser exhaust	Possible exhaust from laser chambers clean room	√	Trace level of F ₂ < 0.8 mg/m ³		
2	C.R. 1 room exhaust	Room extraction – solvents 2012 readings	√	5.5 0.5	5.75 1.3	7.5 2.2
4	C.R. 1 gas exhaust	Emergency extraction for clean-room 1 laser gas cabinets - fluorine.	X			
12	Bay 3 / 4 roof	Emergency extraction for clean-room 3 laser gas cabinets – fluorine and hydrogen chloride.	X			
15	Bay 2 rear wall	Flammable cabinets for IPA used for IPA flushing rigs	X	- 4.8	- 7	- 16.6
VOC		Permit levels		75mg/m ³ average	112.5 mg/m ³ ½ hr average pk.	
		Doubling production has doubled average solvent emissions.		47.1 25.4	60.3 42.4	177 72.7
ACIDS						
	F ₂	Fluorine lasers – clean room one now on stream with increase in number of laser stations.		2.11 0.86		
	HNO ₃	Nitric acid now used in two additional processes.		0.37 0.25		
	H ₂ SO ₄	Better process control with new plating line and premixed supply of etch.		0.01 0.25		
	HCL	HCL laser in clean room 3 decommissioned.		0.08 0.11		
	Pb	Separate monitoring of Kugler dry PZT machining area.		0.04 ----		

Condition Clause 17 : Average 75 mg /m³, Peak average 1.5 times = 112.5 mg /m³. The solvent readings during emission testing from each stacks was within the permitted levels.

Note: Adding all stack emissions the hourly level average was 47.1 mg /m³, peak average was 60.3 mg /m³ and maximum peak level of 177 mg /m³. Although not part of the permit, the clean-room 1 extract was seen as having the highest peak value – 123 mg /m³ and it would be prudent to reduce the level of solvent usage in this area that can only be due to the use of squeeze bottles for surface cleaning.

Although not part of the permit the acid emissions are shown for completeness. The results show that the acid emissions are well controlled with only trace levels from all relevant stacks.