Novanta Technologies UK Ltd.
Crown Close
Crown Industrial Estate
Taunton
TA2 8RX

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Non-Technical Summary

S19-465/NTS
March 2020

Revision 2

Prepared by :

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On behalf of :

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Contents

1.0 Introduction

The Non-Tech Summary Has been prepared in support of a bespoke Environmental Permit Application. Novanta Technologies UK Ltd are a low output high precision operation, specialising in manufacturing small batches of Beryllium Products, namely machine components and mirrors.

2.0 Material Storage

Materials are delivered to site, and placed in secure storage areas. All hazardous materials are listed in the COSHH Register.

All activities involving the machining of beryllium are carried out within a sealed clean room. The beryllium ingots are stored in this area pending machining.

Other materials are stored near to the point of use where safe to do so, and a JIT system is operated so that stored quantities are kept to a minimum.

3.0 Machining

The first step of the process; beryllium blocks are machined in the required shapes. This is a process similar to CNC machining; this happens inside enclosures which are sealed and water cooled during the machining process.

Mirrors and other optical devices go on for plating, whilst other components such as machine parts, are ready for dispatch at this point.

4.0 Plating

Optical Components such as mirrors are plated with nickel. An electro-less process is used. Beryllium “back plates” are submerged in the plating solution. The reaction is monitored and chemical added when required to maintain the reaction.

Alochrom is also used at this stage, as a corrosion inhibitor. Alocrom is a Chromate conversion coating chemically applied to aluminium (and Beryllium), which provides corrosion protection. It is also applied prior to painting or powder coating and is used when protection and/or electrical conductivity is required.

Alochrom contain Chromium VI. As such utmost care is taken when using it. Not all products are treated with Alochrom. The dipping vat contains a maximum of 25 litres of Alochrom, the vat has a lid in place, except for when it is being loaded and unloaded, this would comprise the vat being open to the indoor air for 20 minutes twice a week, this would constitute an emissions reduction factor of 99% pre-abatement.

Alochrom is disposed of via licenced carrier as hazardous waste. Alochrom is not disposed of in to the effluent treatment system or sewer.

5.0 Polishing

The mirror back plates are now coated with nickel, and are ready to be polished.

5.1 Mounting of Mirrors on Polishing Block

The Mirror is mounted on to a Polishing Block by means of pitch. The pitch is applied to the dull side of the mirror, using a small ring of masking tape to contain the liquid pitch until it hardens. The mirror are then placed face down on a surface, and a large round weight is placed on top of them.

5.2 Polishing

The mounted mirrors are no transferred to the polishing machine, which is a large rotating disk smeared with a very very fine ceramic abrasive compound. The pitch is an amorphous solid so as the polishing disc spins around beneath the mirror the mirror shifts slightly so as to account for aberration in the mirrors surface.

The mounting plate above the mirror is allowed to spin also, this can be used to depart curvature in to the mirror surface if desired, and ensure the mirror is polished in a variety of orientations.

5.3 Pitch Removal

The mirrorare now removed from the polishing block and the pitch is removed using acetone. This operation is carried out in a lidded bath, within a fume cabinet. After the acetone bath some traces of pitch may remain, the mirrors are inspected and given a final clean with ether soaked cotton buds (“q-tips”). This final clean is a manual process.

6.0 Coating

An optical coating is one or more thin layers of material deposited on an optical component such as a lens or mirror, which alters the way in which the optic reflects and transmits light. One type of optical coating is an antireflection coating, which reduces unwanted reflections from surfaces, and is commonly used on spectacle and photographic lenses. Another type is the high-reflector coating which can be used to produce mirrors which reflect greater than 99.99% of the light which falls on them.

A complex piece of machinery is used to produce these optical coatings using the “sputtering technique”, it involves the firing of a radio beam at a crucible of molten metal such as gold. The beam ablates metal ions from the surface of the molten metal and they then are deposited on to any metallic surface.

The deposition of the coating material is complete, the inside of the chamber where the process takes places is coated with aluminium foil. The bulk of the metal ions are adsorbed on to this aluminiumfoil.

7.0 Storage & Transfer

Finished Mirrors are either stored pending completion of a batch, or pending a delayed dispatch date. Mirrors are packages sufficiently so as to prevent physical or chemcial damage during transit.

8.0 Further Details (24 February 2019)

Question from Simon Wigglesworth (Senior Permitting Officer National Permitting Service). EA request in green Response in black.

Brief summary of reasoning for changing from old to new location and your plan i.e. is it to be that old operation will fully cease before new installation starts or will there will be dual operation for a period of time.

We would anticipate a 6 month overlap between grant of new (Crown Close) permit and application for surrender of old permit (Lisieux Way).

Confirmation there will be no shared activities between old and new facilities and land for new installation is completely independent of old installation area.

After elapse of this transition period, there will be no interdependence between sites.

Site Location c/w National Grid Reference for centre of site. Please include a summary of local features – residences, habitats etc.

Site grid reference is: ST 24320 25852

Plan S19-465/005 (Appendix 1 Site Condition Report) shows local features.

Paragraph summarising EPR scheduled activities within installation after review as discussed under question 1.

Please see response to EPRDMQrev1.doc.

Confirmation of what existing equipment will be re-used from old installation and what facilities are new.

Reused equipment will include:

- Furniture (Office, Production and Labs)
- Small Items (Kettles & Computers)
- Existing Lap Wheel
- All Vats
- Spectro Analyser
- Vacuum Plater

New Equipment:

- Additional Lap Wheels
- Additional Vats

The capacity of new facility and capacity of old one; are these figures the same or different? Application form B3 Table 1a mentions 3 as a capacity. Please confirm units per annum.

Have supplied updated B3. 5 Metric Tons is anticipated throughput. This is is to allow for 40% increase over coming years.

Number of emission points to air within installation boundary and summary of surface water and sewer discharges from installation boundary.

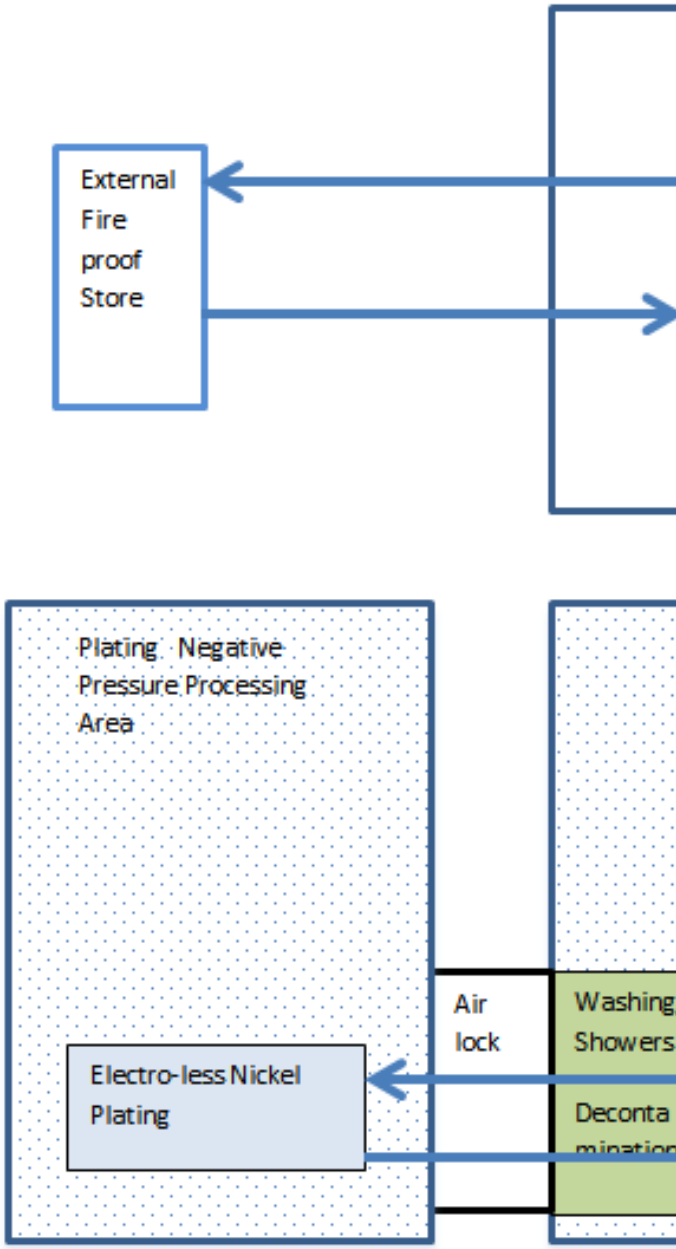
Plan S19-465/009 (Appendix 1 Site Condition Report) shows emission points. Six emission points to air, and one each for surface water and foul sewer.

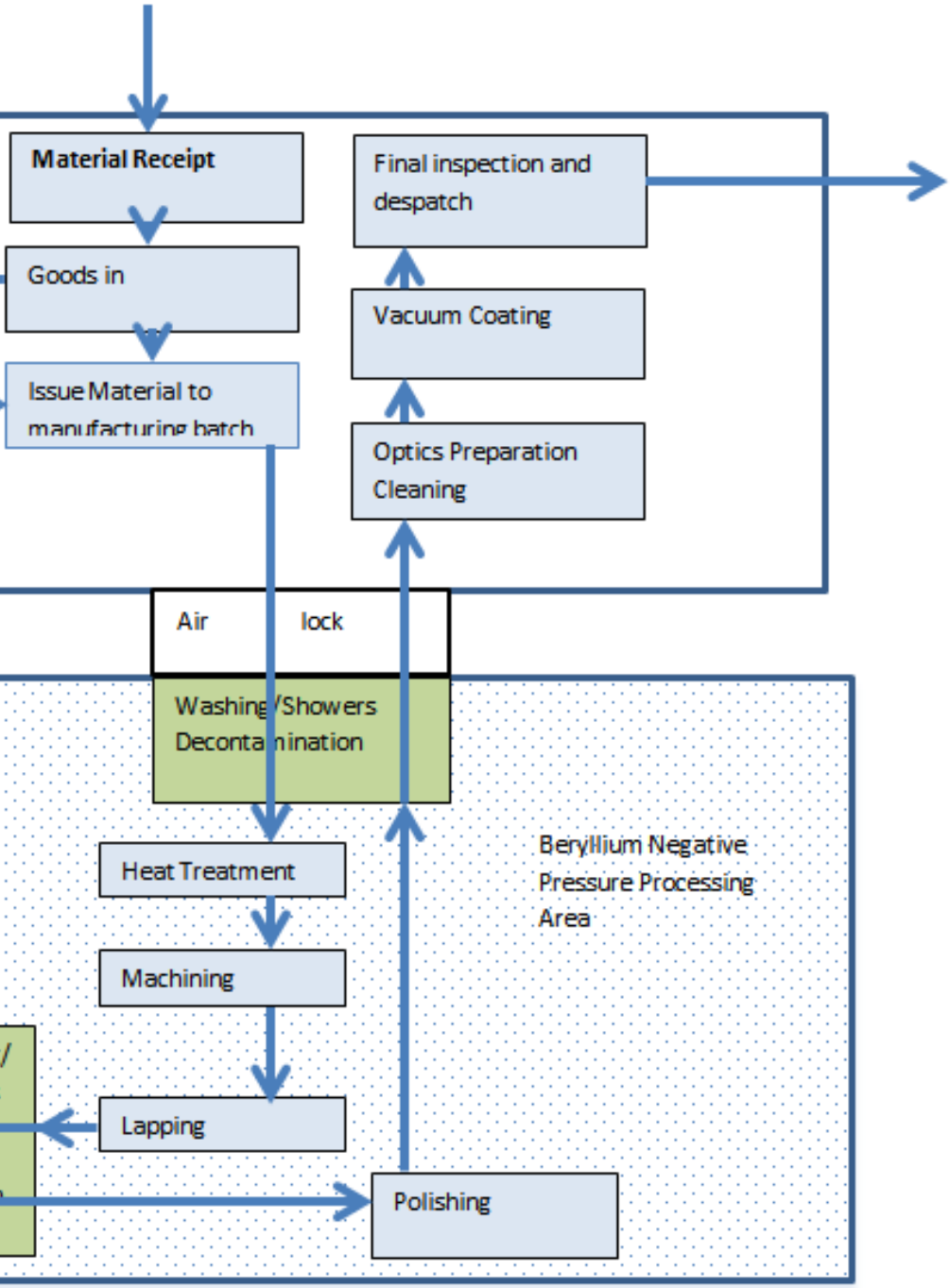
APPENDIX 1

Process Plan

Novanta
Process Diagram

S19-465/PD




Material Receipt
Goods in
Issue Material to
Final inspection and
despatch
Vacuum Coating
Optics Preparation
Cleaning
Air
lock
Washing /Showers
Heat Treatment
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Lapping
Polishing
Beryllium Negative
Pressure Processing
Area