Heating Ventilation and Air-Conditioning Recommendations for Personal Lubricant Manufacture (HVAC)

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Reference Document

- WHO Expert Committee for Pharmaceutical Preparation 52nd Report
- WHO Technical Report Series 1010, 2018
- Annex 8 Guidelines on heating, ventilation and air-conditioning systems for non-sterile pharmaceutical products*

* https://www.who.int/docs/defaultsource/medicines/norms-and-standards/guidelines/production/trs1010-annex8-who-gmp-heating-ventilation-airconditioning.pdf?sfvrsn=c77698e2_0

Microbiological Requirements for Water Based Personal Lubricants

- Non-sterile, preserved liquid preparations
- Subject to bioburden control
- Appropriate measures required to maintain bioburden levels below 100 cfu/g
- Absence of specified pathogens
  - *Pseudomonas aeruginosa*
  - *Staphylococcus aureus*
  - *Candida albicans*
  - *Escherichia coli*
  - *Burkholderia cepacia complex*

General Principles

- The manufacture of lubricants should take place in a controlled environment, as defined by the manufacturer
- The level of air cleanliness for different areas should be determined according to the products manufactured, the process used and the products' susceptibility to degradation
- Starting materials, products, primary packing materials, utensils and equipment should have the same level of cleanliness or classification as the area in which the products are produced
- Where a clean room classification is specified, the manufacturer should state whether the classification is rated for the "as-built", "at-rest" or "operational" condition
- Appropriate design and controls for the premises and HVAC systems should be in place to achieve containment, cleanliness and the appropriate levels of protection of the product, personnel and the environment

Containment, cleanliness and protection may be facilitated through, for example:

- Correct building layout
- Building finishes
- The use of airlocks such as personnel airlocks (PAL) and/or material airlocks (MAL)
- Pass-through hatches (PTH)
- Changing rooms and passages
- Where possible, personnel and materials should not move from a higher cleanliness zone to a lower cleanliness zone and back to a higher cleanliness zone Where this is unavoidable, risks should be identified and controlled

HVC System

- The design of the HVAC system should be closely coordinated with the architectural design of the building
- The HVAC system should ensure that the specified room conditions are attained, for example through heating, cooling, air filtration, air distribution, airflow rates and air exchange rates
- Ingress of unfiltered air into a manufacturing facility should be prevented as this can be a source of contamination
- Manufacturing facilities should normally be maintained at a positive pressure relative to the outside, to prevent the ingress of contaminants

Air Filtration

- Full fresh air or recirculation type HVAC systems may be used. Fresh air should be adequately filtered to remove contaminants
- Where recirculation systems are used, there should be no risk of contamination or cross contamination
- HEPA filters may be installed (in the supply air stream or return air stream) to remove contaminants and thus prevent cross-contamination
- HEPA filters in such an application should have an EN 1822 classification of at least H13 or equivalent
- HEPA filters may not be required to control cross-contamination where evidence that cross-contamination would not be possible has been obtained by other robust technical means, or where the air-handling system is serving a single product facility

Airflow Directions

- Airflow directions should be appropriate, taking operator and equipment locations into consideration
- Airflow should not disrupt the accuracy of balances
- The position of the operator, equipment and containers should not obstruct airflow patterns and result in risks
- Pressure differential should be designed so that the direction of airflow is from the clean area, resulting in dust containment, for example, from the corridor to the cubicle

Monitoring Pressure Differentials

- Pressure differential indication should be provided.
- Pressure gauges or suitable electronic systems such as EMS or BMS
- Pressure indication gauges should have a range and graduation scales that can be read to an appropriate accuracy.
- The normal operating range, alert and action limits should be defined and displayed at the point of indication or EMS/BMS
- Pressure control and monitoring devices used should be calibrated
- Compliance with specifications should be regularly verified and the results recorded
- Pressure control devices should be linked to an alarm system

Factors and Requirements to be Considered

- Temperature and relative humidity control requirements
- Dust vapour and fume control
- Protection of the environment
- Commissioning
- Qualification and validation of the HVAC system
- Documented maintenance procedures and schedules

Questions?

Thank you for your attention