

Change Management Decision Tree Hand Sanitizer

STEP 1: Identification

Clearly identify the individual compounds and concentrations that will be handled during this process. Be sure to include cleaning and sanitization products between batches in this list.

Disclaimer The Manufacturing Safety Alliance of BC recommends the manufacturer review all regulatory requirements that include but not limited to:

- BC Fire Code
- BC OHS Regulations and Act
- CSA Z22.1-18 Canadian Electrical Code
- BC Building Code
- NFPA Standards

It is up to the manufacturer to read, understand, and apply the appropriate Standard and Regulation

STEP 2: SDS Documentation

Obtain the product SDS forms including flash points and safe handling information for the compounds being handled and any note of possible reaction with process materials or equipment.

NFPA 30 Flammable and Combustible Liquids

BC OHS Regulations

Part 5 Suppliers SDS Section 5.14, Employer SDS Part 5 Section 5.15

3A: Do you have adequate eyewash/shower facilities?

BC OHS Regulation Part 6 Section 6.95
Part 5 Section 5.82, 5.85, 5.86, 5.87

Can you flush a chemical burn from 15 to 45 minutes depending on the concentration of chemical? For instance, hydrogen peroxide flushing for 45 minutes will require an inline water heater for your shower or eyewash.

STEP 3: Emergency Response

Check your emergency response equipment and procedures



3C: Spill Response

Do you have a spill response plan and disposal plan for the maximum spill volume?

BC OHS Regulation Part 5 Section 5.101, 5.102

3B: Do you and employees have adequate fire suppression equipment and training should fire break out?

NFPA 10 portable fire extinguishers
BC OHS Regulations Part 4 Section 4.16(2)

Example: Ignition of alcohol fumes while mixing product in a temporary open tank using an electric drill for a mixer.

4A: Do you have an electrically safe ventilation system, rated for use in a hazardous location containing flammable vapours? Or large ambient natural ventilation control? Are there areas of concern where vapours could accumulate, such as basements and in floor drains/trenches?



NFPA 70 electrical code article 500

Vapour Generation When flammable liquids are open to the atmosphere, vapours are released in varying amounts. Environmental variables such as humidity, temperature, and ventilation will determine if vapours will form an ignitable mixture.

STEP 4: Transportation & Dispensing

Are materials created on site (for instance, distilling ethanol alcohol) or are they purchased and brought to site in containers (isopropyl alcohol)?



4B: Dispensing

Is there a material transfer process developed to minimize the turbulence during fluid transfer?

NFPA 30 Flammable and Combustible Liquids Code
BC OHS Regulations Part 5 Section 5.30, 5.27

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BC Fire Code Part 4 Division B 4.2.5.3, 4.2.6.3., 4.2.7.4
BC Fire Code Part 4 Division B 4.2.9 Rooms for Storage and Dispensing

The dispensing of flammable liquids from one stage of the process to another needs serious consideration to ensure that alcohol vapours do not reach ignitable concentrations.

5A: Grounding and Bonding

Do you have a grounding and bonding program established to minimize static electricity ignition risk?

NFPA 77 Grounding and Bonding
BC OHS Regulation Part 5 Section 5.28
CSA C22.1-18 Canadian Electrical Code Grounding and Bonding of Lighting Equipment Section 30 Subsection 30-112

Static Electricity Static electricity will be created when transferring a flammable liquid from one container to another.



STEP 5: Ignition Risk

Have sources of ignition been identified and controlled?

BC OHS Regulation Part 5 Flammable and Combustible Substances



5C: Lighting should meet electrically safe guidelines. Does the lighting system in your workplace meet regulations to ensure it won't ignite explosive vapours?
Canadian Electrical Code Part 1 Section 30 Installation Subsection Location of Lighting 30-200 Near or over Combustible Material

5B: Electrical Equipment Sources

Is the area where vapours will be present designed to be electrically safe for the hazard present?

NFPA 70 electrical code article 500
BC OHS Regulation Part 5 Section 5.27
CSA C22.1-18 Canadian Electrical Code Section 30 Subsection 30-200 Lighting Near or over Combustible Material

Equipment Ignition Risk Ensure electrical equipment, lighting, cabling and connections in the area meet the electrical code requirements for flammable vapour hazards. Are mobile equipment and power hand tools safe to operate in this environment?



6A: Alarm/Alerting Systems

Install gas/vapour/fume detecting systems To alert workers before hazardous levels occur.



STEP 6: Monitoring Process

Are there systems in place to alarm should flammable levels reach the lower flammable limit of the products in the process?



6B: Exposure Control Plan

Consult the SDS for the appropriate controls to eliminate or reduce exposure. If needed, develop ECP specific to the process and materials.

BC OHS Regulation Part 5 Section 5.54

7A: FR Clothing

Research for the correct rating of Flame Resistant (FR) clothing.
NFPA 2113 Standard for FR clothing

STEP 7: PPE Review

Protective Clothing/FR Rated

If there are flammable vapours present as a result of the process, do employees require flame-resistant clothing and PPE to reduce the risk of injury should a flash fire occur?



7B: Protective Clothing/PPE

Ensure the PPE such as Eye and Face shields are rated for flash and flame incidents.

BC OHS Regulation Part 8
Section 8.3, 8.14 to 8.17, 8.19, 8.22

8A: Process Storage

Consult local fire codes on allowable storage of flammable or combustible materials. Consult municipal bylaws and fire codes on storage requirements.

NFPA 30 (alcohol base) or
NFPA 432 (hydrogen peroxide based)

BC Fire Code Part 4 Division B General Storage 4.2.8.4

STEP 8: Storage

How much flammable product will have to be stored to feed the process, how much finished product will have to be stored waiting for delivery to consumer?

8B: Finished Product Storage

Consider the final product combustibility or flammability in conjunction with fire codes and municipal bylaws on storage requirements.

NFPA 30 or NFPA 432
BC Fire Code Part 4 Division B 4.2.9 Rooms for Storage and Dispensing

STEP 9: Training

What training will be required to educate employees on the hazards present and the actions required in the manufacturing process and in event of emergency response? A test of the response plan should also be conducted to verify its effectiveness.

STEP 10: Confined Space Procedures

Have confined space procedures been updated to reflect the additional hazard present when cleaning vessels and tanks that could have flammable vapours and jell residues from hand sanitizer production? **BC OHS Regulation Part 9**

STEP 11: SDS Development

Has an SDS been created to send with the deliveries to consumers institutions listing the product properties as required under the WHMIS 2015 legislation? **Employer SDS Part 5 Section 5.15**