

# NANOPARTICLES/NANOMATERIALS USE

## COLLEGE PROTOCOL & TRAINING ACKNOWLEDGEMENT

Date		<input type="checkbox"/> NEW <input type="checkbox"/> RENEWAL #:	
NAME		CONTACT NUMBER	
EMAIL			
Lab/Research Name	<input type="checkbox"/> Pilot Plant (1D04) <input type="checkbox"/> Other:	Lab Room Number(s)	
PI Name		PI Phone Number	
Brief description of NP/NM research			
Current NP/NM SOP Available	<input type="checkbox"/> YES <input type="checkbox"/> NO		

Nanomaterial safety training provided by Safety Resources: <http://safetyresources.usask.ca/services/training/index.php>

### HEALTH AND SAFETY SUMMARY:

- There is increasing use of nanoparticles/nanomaterials (NP/NM) in laboratories in the College of Engineering (CoE) at the University of Saskatchewan. **It is recognized that there are currently unknown risks associated with this work.**
- Because of the relative newness of NP/NM in the laboratory research and occupational setting there is limited data relating to the hazards and health and safety risks to personnel and students using NP/NM. However, some evidence that NP/NM are currently unpredictable in their nature and affects, therefore we must all treat NP/NM as high hazard work until we know better about possible lasting health effects.
- The Principal Investigator (PI) is responsible to ensure compliance with this College Protocol and Training Acknowledgement, as well as ensuring written NP/NM standard operating procedures (SOPs or HAZOPs) are completed and up-to-date.
- **CSA Standard Z12885-12** “Nanotechnologies – Exposure control program for engineered nanomaterials in occupational setting” is available to those working with NP/NM and writing research SOPs & **can be signed out for reference at 1D23.**
- **Annex E of CSA Z12885-12 contains valuable information regarding the use of PPE and fumehoods.**

### RECOGNIZED HEALTH, SAFETY & ENVIRONMENTAL HAZARDS:

**Toxicity:** limited data available, *MODERATE TO HIGH RISK*

**Eye Contact:** may cause irritation, limited data available, *MODERATE RISK*

**Inhalation:** causes irritation and is possibly carcinogenic, *HIGH RISK*

**Skin Contact:** May cause sensitization with prolonged skin contact, limited data available, *MODERATE RISK*

**Ingestion:** Lower oral acute toxicity, but may irritate gastrointestinal tract, *MODERATE TO HIGH RISK*

### RULES FOR WORKING WITH NP/NM IN THE College of Engineering:

1. **Training is required for all users of NP/NM;** including use of this protocol and training document;
2. **Written SOPs (or HAZOP) are required for each specific research activity utilizing or generating NP/NM;**
3. **All NP/NM laboratory research work** is to be performed in a FUMEHOOD (or similar controlled environment);
4. **All NP/NM transport** must be securely contained for any transport within labs and between labs;
5. **All NP/NM waste** must be packaged properly as Hazardous Waste and disposed through the university’s Waste Management Facility (WMF);
6. **All NP/NM exposures/leaks/spills** must be reported immediately to CoE Local Safety Committee (LSC);
7. **NP/NM Safety Data Sheets (SDS or MSDS)** must be readily available and followed diligently; and,
8. **Monthly inspection reports** for labs using NP/NM are required to be provided to the CoE LSC for review.

## SPECIFIC PROTOCOL FOR ELEMENTS OF NP/NM RESEARCH

### CHECK TO ACKNOWLEDGE UNDERSTANDING OF EXPECTATIONS RELATING TO NP/NM RESEARCH WORK:

**NP/NM PERSONAL PROTECTIVE PROTECTION (PPE) USE:**

- Wear appropriate lab attire and footwear
- Wear good quality puncture resistant and chemical-resistant disposable gloves. For added safety a second layer of gloves can be used, as recommended in the CSA Z12885-12 standard
- Wear chemical safety goggles
- Avoid contact with eyes, skin or clothing
- Use appropriate respirator or mask to avoid inhaling NP/NM
- Minimize the number of employees handling NP/NM

 **Fit testing completed**
**NP/NM GENERATION, USE, STORAGE & TRANSPORT:**

- All work is to be performed in a FUMEHOOD (or similar controlled environment)
- Keep tightly sealed in storage and during any transport (use plastic container with secure lid as secondary containment); utilize secondary containment and rolling carts, as appropriate
- Store in a cool, dry and well labelled area ('nanoparticles storage area')
- Do not store together with a) acids, b) oxidizing agents or c) halogens
- Minimize NP/NM handling whenever possible

**PROPER NP/NM WASTE DISPOSAL:**

- NP/NM waste material shall be classified and coded as 'nanoparticle hazardous waste', and depending on the type of waste it can be either:
  - 1) Double wrapped in sealed polythene bags, and placed in a sturdy card board box or in a plastic pail with a gasket sealed lid and labelled with orange hazardous waste labels, (contaminated disposable gloves, clothing, wipe down cloths, etc.)
  - 2) Placed in a sturdy cardboard box or plastic pail with a gasket sealed lid, and labelled with orange hazardous waste labels, (unused material already in the supplier's container)
- Complete the Hazardous Waste Disposal Form and contact Waste Management Facility to pick up the waste

**CLEANING MINOR NP/NM SPILLS OR LEAK REMEDIATION PROCEDURES:**

- Secure the area before initiating clean up procedures
- If exposure is expected, then wear your respirator with HEPA cartridges during clean up procedures
- Wear chemical safety goggles
- Wear good quality puncture resistant and chemical-resistant disposable gloves
- Avoid raising any airborne particulates
- Use good 'wet-wiping' techniques and/or use designated vacuum cleaner, with approved HEPA filter
- Wipe up spilled material and place the contaminated wet wipes and gloves in a double bag, seal properly and dispose of through the University of Saskatchewan Waste Management Facility
- Wash spill site with hot soapy water and dispose of all NP/NM contaminated waste water through the University of Saskatchewan Waste Management Facility

**NP/NM Research Specific SOP(s):**

- SOP(s) are Current (Date: \_\_\_\_\_)  Includes emergency shutdown procedure(s)
- SOP(s) are Posted (Location: \_\_\_\_\_)
- MSDS or SDS are readily available: (Location: \_\_\_\_\_)
- SOP(s) Reviewed by College of Engineering Local Safety Committee (Date: \_\_\_\_\_)

**RESEARCHER/GRADUATE STUDENT ACKNOWLEDGEMENT:**

<b>SIGNATURE</b>	X	<b>DATE</b>	
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**SUPERVISOR REVIEW AND APPROVAL:**

<b>NAME</b>		<b>ROLE</b>	<input type="checkbox"/> PI <input type="checkbox"/> LSC <input type="checkbox"/> Other
<b>SIGNATURE</b>	X	<b>DATE</b>	