

Faculty of Medicine Policy re: use of potable water for aspirators and cooling

1. Purpose & Rationale:

- 1.1. Reduction in energy and water consumption costs
- 1.2. Reduction in flooding potential
- 1.3. Adherence to city by-laws: Once-through instrument cooling and flow-through water-based aspirators are in violation of the City of Calgary by-law #40M2006:
 - “No Person shall install or allow the installation of any Once-Through Cooling Equipment connected to The City of Calgary’s Water Supply, in any residential, industrial, commercial or institutional construction, development, retrofitting or restoration project.”
 - “No Person shall interfere in any way with or cause any interference with the use of the Water System by another Customer, and without limiting the generality of the foregoing, shall not attach any device to any water pipe which may create noise, a pressure surge, back-flow or contamination of the Water System;”
 - “Any Person who is convicted of an offence pursuant to this Bylaw is liable on summary conviction to a fine not exceeding \$10,000.00 and in default of payment of any fine imposed, to a period of imprisonment not exceeding six (6) months.”

2. Policy Statement:

- 2.1. The use of water-based aspirators is not permitted.
 - Special notice should be taken that the HRIC building has been outfitted with back-flow protection devices that **must not** be removed by users attempting to fit aspirators salvaged from HSC or HMRB.
 - Alternatives are described in the appendix.
- 2.2. The use of once-through¹ water cooling in new/replacement installations (where cost effective alternatives are available) is not permitted.
- 2.3. Arbitration of matters arising from the Potable Water Policy:
 - Matters referred for arbitration² will be reviewed at regular meetings of the Committee for Research Infrastructure (comprising Institute, Core Facility and Faculty of Veterinary Medicine representatives) with a representative of Campus Infrastructure to be invited as necessary.

3. References:

City of Calgary by-law #40M2006
<http://www.calgary.ca/DocGallery/BU/cityclerks/40m2006.pdf>

4. Effective Date: July 1, 2010

¹ i.e. any non-closed loop of cooling water which flows directly (or via a heat exchanger) to drain.

² E.g. Cost: lack of practical/affordable alternatives when dealing with heat that would be (upon banning once-through-cooling) transferred into the building air system – Microscopy and Imaging Facility: significant heat from electron microscopes would require costly plumbing connections to cooler remotely placed in machine room at top of HSC. Reported cost of chiller ~\$12K USD; installation at ~\$20-\$30K.

Appendix:

Aspiration alternatives

1. Air-based aspirators: air-turret vacuum adaptors are normally stocked in BTSC @\$50.00 ea (including the cost of machining the air turret nozzle). See footnote for direct supply³. The adaptors are designed to provide a suction flow of 12L/min. or a vacuum of 67-KPa /~20" of mercury.

NB: Campus Infrastructure is responsible for the maintenance of air-dryers to remove water from compressors, but users still need to periodically bleed accumulated condensation (especially from infrequently-used air lines) and are advised to refer intractable incidences of excess moisture to C.I. via i-request (<https://ci.ucalgary.ca/irequest/>).

2. Vacuum pumps:
 - o Welch (see footnote for link to pump guide⁴) Std. Duty Dry: Not recommended for pumping acid, base or organic vapours.
 - 2546B-01 (VWR #80077-612) @~\$620.00 – 27.6" Hg, 45 L/min
 - 2522B-01 (VWR #54994-106) @~\$500.00 – 26" Hg, 25 L/min
 - 2585B-50 (VWR #54970-544) @~\$1,700.00 – 27.6" Hg, 201 L/min
 - 2515B-75 (VWR #80089-644) @~\$1,300.00 – 27" Hg, 34 L/min (with fluid trap)
 - o Welch Chemical Duty Dry: Withstands aggressive acid, base, organic vapours.
 - 2047B-01 (VWR #55009-294) @~\$2,300.00 – 35 torr, 70 L/min
 - 2032B-01 (VWR #55009-284) @~\$2,400.00 – 2 torr, 25 L/min
 - o Cole-Parmer (see footnote for suggested Welch alternatives via VWR⁵)
 - Air Cadet diaphragm vacuum/pressure pump (EW-07531-40), 23" Hg, 15.5 L/min, cost @~\$300.00; BTSC stocks parts (<http://www.ucalgary.ca/btsc/>).

³ Air Turret Vacuum Adaptors (Pisco #VHL05-4M5) are sold in quantities of 10ea. @~\$25.00 ea. by:
Peerless Engineering Sales Ltd.
4015 East 1st Ave.
Burnaby, B.C. V5C 3W5
Ph: (604) 659-4100
Fax: (604) 659-4121

⁴ Welch (via VWR) has a large & detailed guide to vacuum pumps; click on the appropriate link to the PDF at: <http://www.welchvacuum.com/> . Contact sales engineer John Brock for selection/advice: john.brock@gardnerdenver.com

⁵ Welch alternative to Cole Parmer pumps: For Cole Parmer EW-07531-40 and EW-79202-00: Welch 2511B01 pressure and vacuum station (VWR #97000-076) @~\$300.00 219 Torr vacuum, 0.39 cfm, 33 psig pressure, oil-less – for non-corrosive aqueous fumes.

- Air Admiral diaphragm vacuum/pressure pump (EW-79202-00), 20” Hg, 10.5 L/min, cost @~375.00; **NOT** for organic, basic or acidic vapours.
 - Water-Jet aspirator pump (EW-35031-00), 29.5” Hg, 18 L/min, cost @~\$1,300.00
3. Local-area-network vacuum systems: these integrated systems provide multiple points of use within an approximate 50 foot radius of a single central vacuum pump. Components are designed with automation, prevention of cross-contamination and chemical resistance in mind.
- Vacuubrand (represented by VWR) @~\$10,000.00-\$14,000.00