**University of Würzburg**



Office of Occupational Health and Safety, Animal Welfare and Environmental Protection

# Safety Guidelines

**Vacuums**

Last update:

Workplace/activity:

|  |  |
| --- | --- |
| **Scope** | |
|  | Safe handling of evacuated glass or Dewar vessels; vacuum distillation; safe operation of rotary evaporators. |
| Safety, health, and environmental risks | |
| L:\StabsstelleAU\Fischer\Ingrid\Betriebsanweisungen\Symbole\W00.WMF | * Implosion hazards arising from improper operation of equipment and/or use of non-vacuum-rated glassware. * Under a water jet vacuum (20 hPa), vessels are subject to pressure loads of approx. 1000 g/cm2; under a high vacuum, pressure loads are only 10-20 g/cm2 higher. * Injury from flying glass shards. |
| Safety practices | |
| http://upload.wikimedia.org/wikipedia/commons/thumb/c/cc/DIN_4844-2_Warnung_vor_heisser_Oberflaeche_D-W026.svg/616px-DIN_4844-2_Warnung_vor_heisser_Oberflaeche_D-W026.svg.png  L:\StabsstelleAU\Fischer\Ingrid\Betriebsanweisungen\Symbole\W02.WMF  L:\StabsstelleAU\Fischer\Ingrid\Betriebsanweisungen\Symbole\M01.WMF | * Always use heavy-walled, round-bottom glass vessels (do **NOT** use conical flasks, measuring cylinders, Erlenmeyer flasks, etc.). Take measures to restrain fragments in case of implosion: Place glassware in wire cage or behind acrylic/blast shield or wrap glass vessels in tape or plastic mesh. Use boiling capillaries, boiling chips, or magnetic stir bars to prevent delayed boiling. Always assemble equipment to avoid strain on tubing and connections. Always wear safety glasses with side shields and eyebrow protection. **Before you start evacuation:** Inspect glassware for cracks (especially ‘star cracks’). Use a cold trap to condense uncondensed vapours or use other method to safely dissipate such vapours. **When you carry out vacuum distillation or use a rotary evaporator: Evacuate before you apply heat.** Never apply heat unevenly to evacuated components. |
| **What to do in the event of equipment failure** | |
| L:\StabsstelleAU\Fischer\Ingrid\Betriebsanweisungen\Symbole\M13.WMF | Immediately remove heat sources, after that: ventilate apparatus, after that: turn off pump. |
| **What to do after an accident** | |
|  | * Turn off apparatus. * Move injured persons to a safe area. * Render first aid (stop the bleeding, place amputated limbs in a plastic bag so that they can be transported to the hospital along with the patient, immobilise fractured limbs). * **Call 112 to alert emergency responders.** * Report accident. |
| **Maintenance, waste disposal** | |
|  | * All maintenance work must be performed by authorised, qualified personnel. |

……………………………………. ……………………………………………….

Date Signature

|  |
| --- |
| June 2021 |