Solvent Cleaning SOP

Introduction:

Solvent cleaning is an important preprocessing step for any bonding or coating process, and pertinent to the success of any microfluidic device. A three step process utilizing Acetone, Isopropyl Alcohol, and deionized water is used in conjunction with a sonicator to clean all surfaces of the parts before assembly. Solvent dishes or solvent resistant polypropylene bags are filled with solvent and submerged in a sonicator filled with DI water; please choose the container best suited to your substrate to reduce the necessary quantity of solvent. This allows small quantities of solvent and only one sonicator to be used to complete multiple cleaning steps at once.

Safety Considerations:

- Isopropyl Alcohol and Acetone are flammable materials and cannot be placed directly in the sonicator bath. They must be contained within a separate vessel placed inside the bath
- Large chemical spills are a possibility. Pour all chemicals inside the fume hood.
- Keep fume hood sash at or below maximum opening level to ensure adequate air flow.

Required PPE:

- Gloves (Latex {non permeable to acetone} or Nitrile)
- Eye Protection
- Lab Coat

Procedures:

- Remove the metal lid of the sonicator bath. Check that the bath is filled to the operating level (if not, fill to the line with DI)
    - **Solvent Dish Method**
        - Place the plastic cutouts for evaporating dish across the bath (located adjacent to the sonicator), resting it on the ledges that seat the lid
        - Retrieve the appropriate evaporating dish from the drying rack above the sink in the microfluidics lab. - Select the beakers labeled Acetone, IPA, and DI Water
        - Fill each beaker with the corresponding chemical using the solvent bottles in the cabinet underneath the fume hood
        - Carefully seat each beaker in one of the cutouts. Confirm that the base of the container rests below the water level
        - Using tweezers, Place the parts in the Acetone beaker first. Sonicate for 5 minutes
    - **Plastic Bag Method**
        - Retrieve 3 PP bags from the blue container adjacent to the sonicator. Using a sharpie, label the bags Acetone, IPA, and DI Water
        - Using compressed air, gently pressurize the bags before releasing the pressure. This will break the static adhesion of the inside layers. Failure to do so may cause the solvents to overflow during filling

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    - Fill each bag halfway with the corresponding solvent. Carefully pour the solvents to avoid spills, use the provided rack to keep the bag upright.
    - Using tweezers, place the parts inside the Acetone bag. Seal the bag and clip the filled bag to the rail
    - Hang the rail across the sonicator bath, resting it on the ledges that seat the lid
- Sonicate all substrates for 5 minutes going from Acetone, to IPA, to DI water. Acetone tends to leave a slight film as it evaporates which necessitates the IPA wash following the acetone wash.
- Remove parts and dry with compressed air or filter nitrogen. Place into a clean travel case and close the lid to reduce contamination.
- Discard solvent in the solvent waste bottle found in the cabinet underneath the fume hood. Pour chemicals inside the fume hood and use the funnel (found next to the waste bottle) to minimize spills
- If needed, replenish the DI water in the sonicator bath to the fill line.
- Return hanging rail or plastic cutout shelf in blue container adjacent to the sonicator
- Replace the bath lid

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