

Bulk hydrogel films can be synthesized with 2 steps – pre-polymer mixing and crosslinking. Hydrogel thin films can be synthesized and patterned with 3 steps – pre-polymer mixing, wafer treatment and spin coating, and photo-crosslinking.

The manual will first list high-level steps, and then walk you through detailed step-by-step instruction using UV-crosslinked HEMA-DMAEMA (2-hydroxyethyl methacrylate; N,N-dimethylaminoethyl methacrylate) as an archetypical example for both bulk and thin film processes for its wide usage in sensing [1] and drug delivery [2]. Frequently asked questions and recommended trainings are included.

The fabrication manual is organized as:

1. Bulk fabrication
2. Thin film fabrication
3. FAQ: Silanization
4. FAQ: Fabrication and Characterization
5. FAQ: Material Procurement and Handling Safety
6. Recommended list of trainings
7. List of references

Please note, the parameters listed in the manual have not been optimized for best resolution or repeatability yet and can only be used as a starting point. The manual aims to identify the relevant tools and set up a baseline procedure to introduce hydrogel thin film fabrication and characterization at the SNF facility. The parameter can be optimized further for the HEMA-DMAEMA hydrogel and will be re-characterized when introducing new type of hydrogels into SNF.

As SNF is mainly a research facility located in electrical engineering, most lab spaces do not come with all necessary chemical equipment and many lab-members are unfamiliar with hydrogel compound chemicals involved in the process, Therefore, please remember to be courteous to the lab-members by labeling all chemicals properly and cleaning up the lab space when you are done. Refer to safety notes on the exact procedure.