



above (l-r): FoxLin, Bubbles; Frei Otto, Bubbles; Ernesto Neto, Park Avenue Armory Installation

Hypertension

Part 1a: Membranes

Due in class Tuesday

Hypertension is about excess, about exceeding a merely structural performance and observing what is gained (and lost). In this exercise, we'll begin to study multiple ways that a tensile membrane can perform.

We'll start with something easy and prescriptive that yields analyzable results, testing a method of inquiry that has been developed in the last century for tensile membranes and formfinding. In our case, it is also a chance to establish practices of formalizing research and of making performative models; to do something material and experimental as a means into our inquiry; and to build a group body of studies that are iterative, that build on one another successively.

This exercise will investigate physical tension in the development of structural surfaces through performative models, in each of which a known input, processing, and output can be identified. These will explore actual surface tension: buoyancy, surface strength, orientation. These, in turn, can be understood as indicators for organization of movement, space, and interactions of other kinds. We begin with soap bubbles and membrane structures, as demonstrated at length in Frei Otto's *Pneus in Nature* and in Martin Bechthold's *Innovative Surface Structures*.

References:

Frei Otto, *Pneus in der Natur*

Martin Bechthold, *Innovative Surface Structures*

Kolarevic & Malkawi, ed.s, *Performative Architecture: Beyond Instrumentality*

Statement of Inquiry

Settle on a simple inquiry for soap bubbles, identifying what you aim to learn.

- ★ state the issue you wish to investigate, and your hypothesis
(i.e. cost/thinness/weight/porosity; that cost and weight are exponentially related)
- ★ summarize the methods by which you are investigating (i.e. variable width diaphragms)
- ★ describe the results from that inquiry and analysis

Steps

1. Construct a variable structure for the creation of soap bubbles. This may be hacked together from found objects, built in the shop, laser cut from a digital file, or other. Be creative and think in terms of high degrees of variability, so that your structure can test the performance of soap membranes repeatedly.
2. Test soap in the structure repeatedly, against your statement's goals. Record variables such as diameter openings, ratios of water to soap, air conditions where you are testing it, etc.
3. Document these tests consistently in photographs, each time from the same place and framed the same way, so that results can be compared.
4. Build a model of one of your results to present in class, in which you translate the performance of the soapy water into heat-sealed polyethylene (this can be bought at Home Depot or a supermarket as garbage bags, and sealed with a common household iron). In this, you will determine a relationship to scale, to a static condition and orientation, and to an "excess" condition such as an idea of its order, interaction, or physical sensations.