

WHO IS SOFTSTAR SHOES?



Softstar Shoes is a custom leather shoe manufacturer located in Philomath, Oregon. Timeliness of their high-end products is essential to maintaining their long-standing commitment to quality. In addition, they are dedicated to environmental mindfulness, working sustainably to minimize their footprint.

PROJECT OBJECTIVE

- Reduce overall Work-in-process (WIP) on shop floor by 15-20%.
- Identify the "worst" process and cut that process by 50%.
- Identify which processes involve the most amount of non-value time and prioritize those processes.

CONCLUSIONS

- Reduced Drying time
- 24 to 4 hours
- No leather shrinking
- Reduced watermarks
- IMPLIES → more batches, less WIP

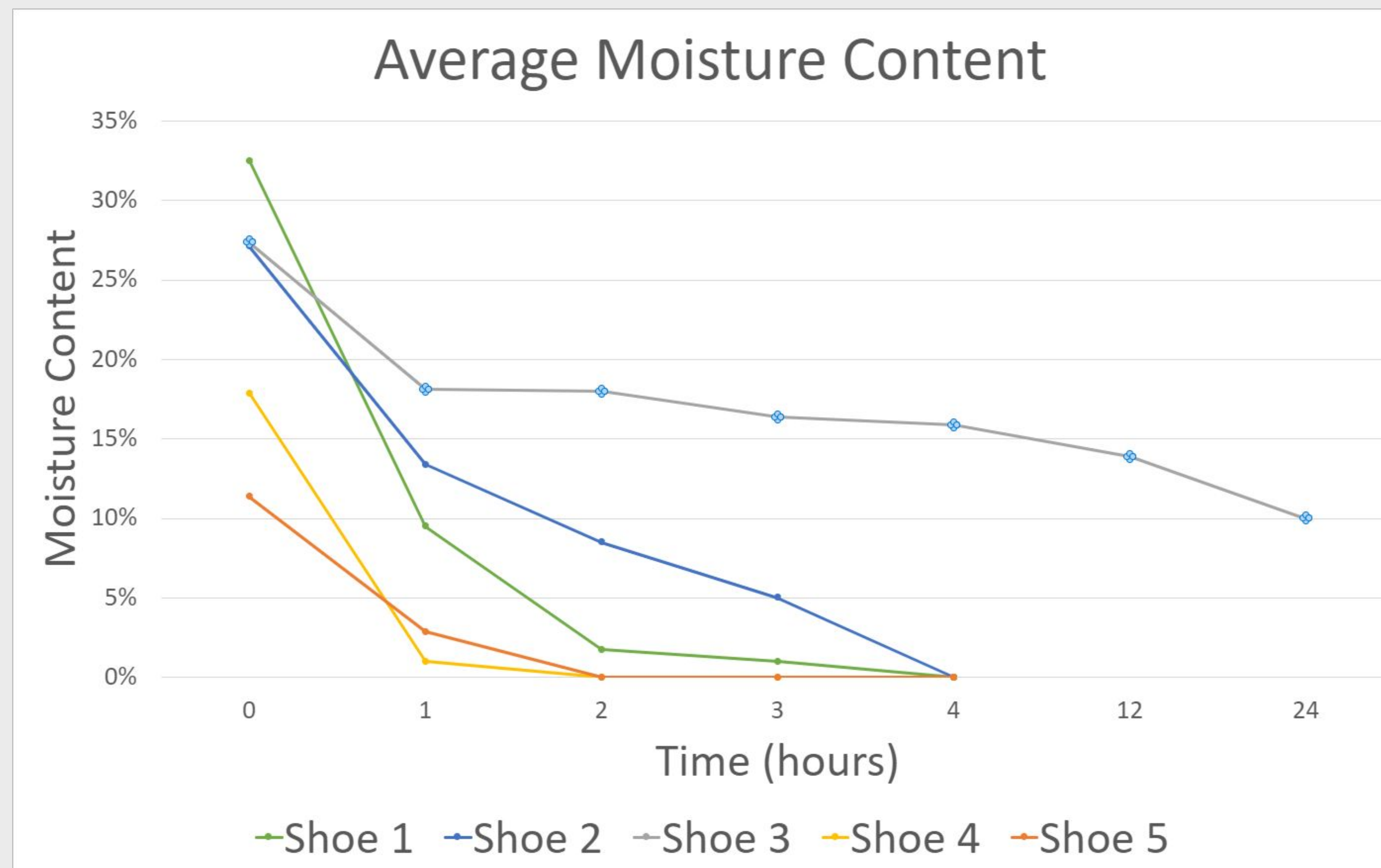


REDUCING WIP IN SHOE MANUFACTURING

Oregon State Advisors: Dr. Sarah Oman, Dr. David Porter, and Dr. Joseph Agor

Softstar Team: Trish S, Keita B, and Lewis L

Project Team: Anshul Prasad, Carter Franiey, and Gabrielle Paul



Graph 1. Average moisture content vs. time dried per shoe type

TIME STUDY

Gaining a clear picture of the specific processes along the manufacturing line, the team concluded that a time study must be conducted to identify areas of non-value-added time. As seen in Table 1, time study sheets were distributed over a 2-week period collecting start times and dates at the 7 workstations. Data was collected and analyzed by the team to identify the workstations with the highest levels of WIP— stations 1, 5, and 7.



Table 1. Average work in progress each each workstation

SOLUTION: Proofing Oven

- Temperature setting: 75-80°F
- Air baffle and circulating air blower provides even heat distribution throughout the chamber
- Humidity controls: 30%
- Extension cord with timer
- 120V electrical connection
- Capacity for 20-24 shoes



Figure 1. Proofing oven solution

DESIGN OF EXPERIMENT

To meet customer expectations, we designed and conducted an experiment on leather drying. Our final design involved converting an old chest into a controlled testing environment. Airflow holes and heat lamps were added to allow for warm air circulation. Leather is cut into 2-square inch squares and placed on silicone-covered racking to prevent leather from being overcooked.

The process of the experiment includes:

1. Gather and set up materials
2. Ensure fridge temperature is at equilibrium at specific temperature
3. Dip leather in hot water (95 – 105°F)
4. Place leather in heated fridge (multiple locations)
5. Test moisture content with moisture meter at 0, 1, 2, 3, 4, and 24 hours
6. Measure size of leather at 0, 1, 2, 3, 4, and 24 hours
7. Record data in spreadsheet
8. Repeat steps 2-7 at all temperatures
9. Repeat process on all shoes

Necessary features:

- Heat source: 75-80F
- Enclosed space to hold temperature
- Circulating air: fan, wire racks
- Moisture control
- Timer

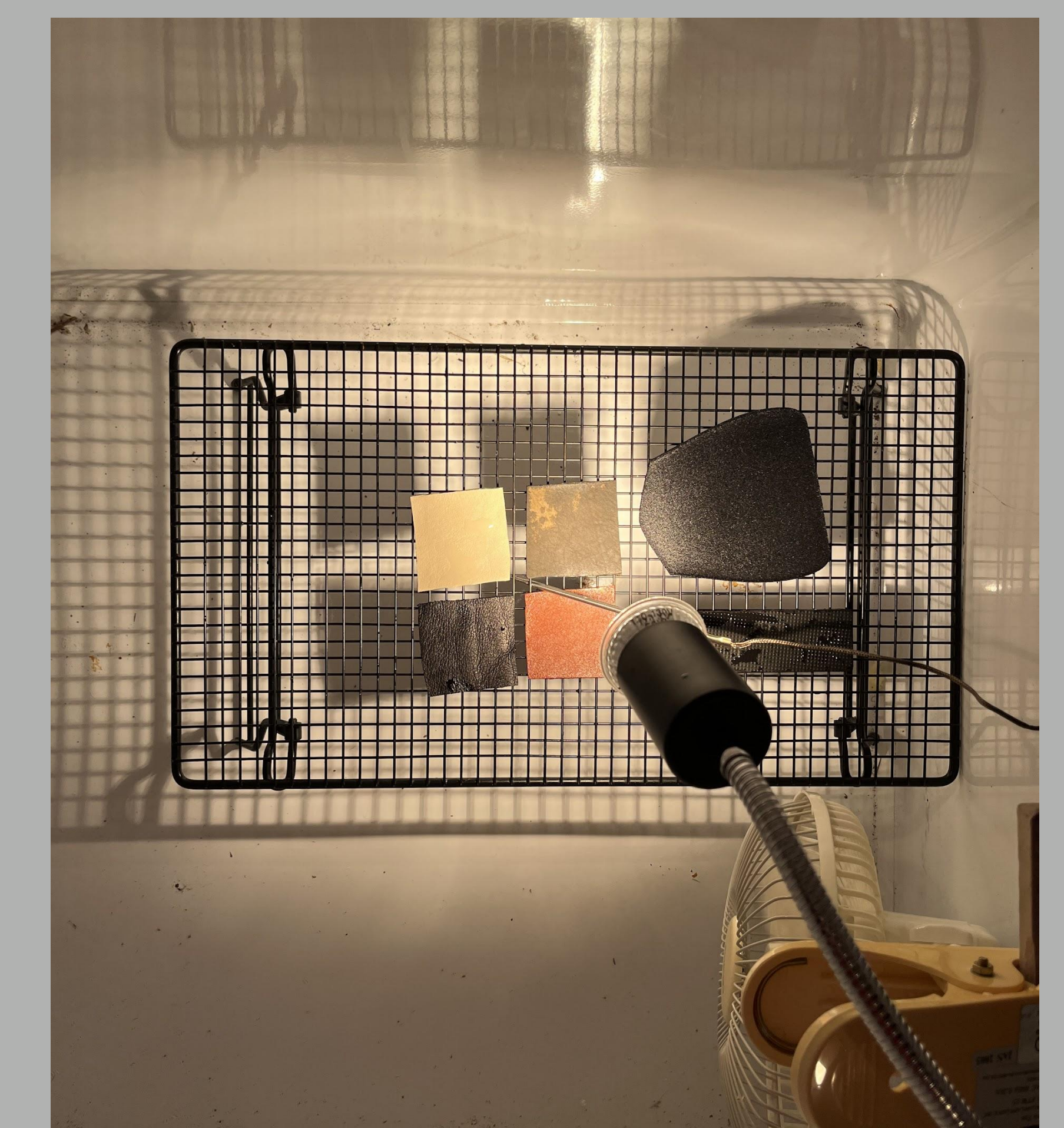


Figure 2. Drying experiment set-up