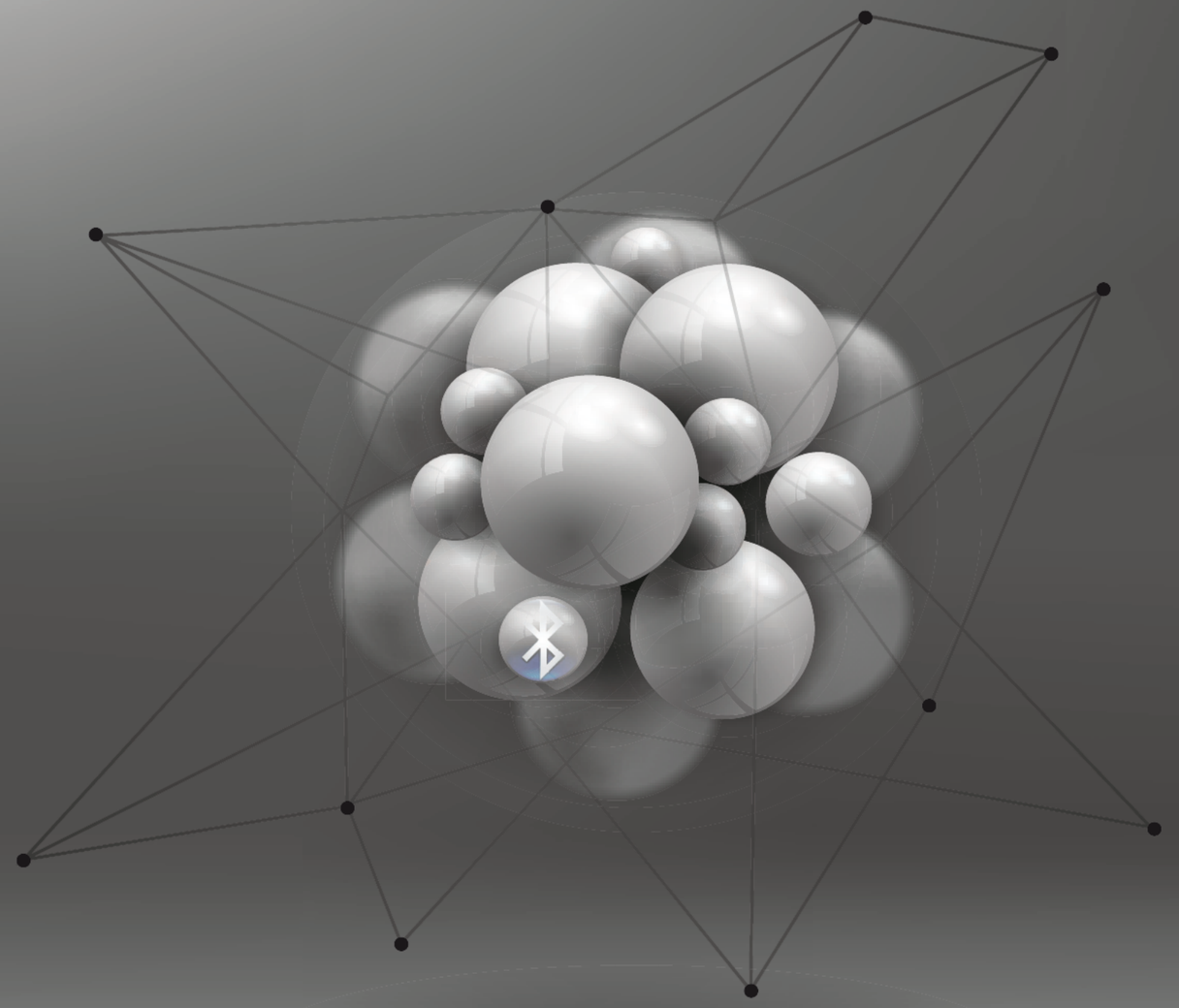
δ(μN) Dynamic Friction Polymer

PROGRAMMABLE MATERIALITY



Team: Xu wang, Wanli cheng, Guillermo Bernal

δ(μN) Dynamic Friction Polymer

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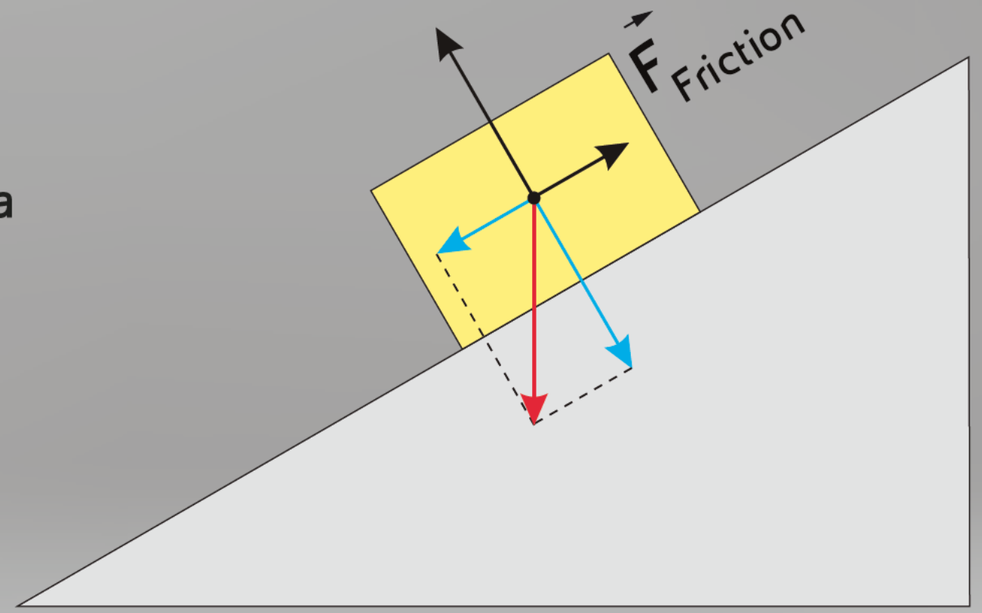
How can radical atoms change the way we experience the world?

Motivation

Friction is resistance for objects static or in motion, and is a material property for every object in our world. We propose a new material that is capable of changing it's coefficient of friction as needed to achieve a specific goal; a Dynamic Friction Polymer.



What if polymers have digital behaviors?

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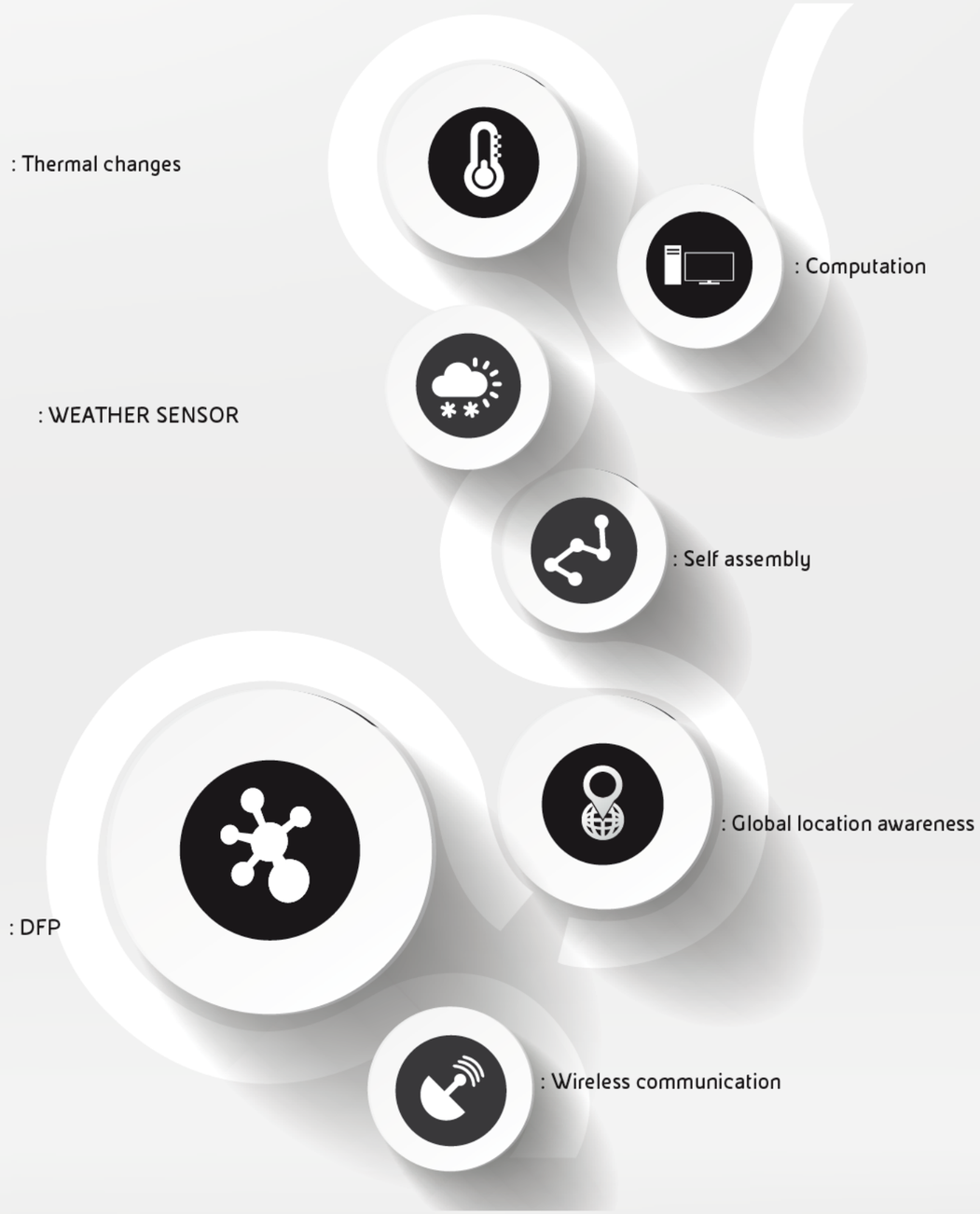


Design Rationale

Scenario 1

Design Rationale

Http://www.youtube.com/watch?v=YcNStXDauRU

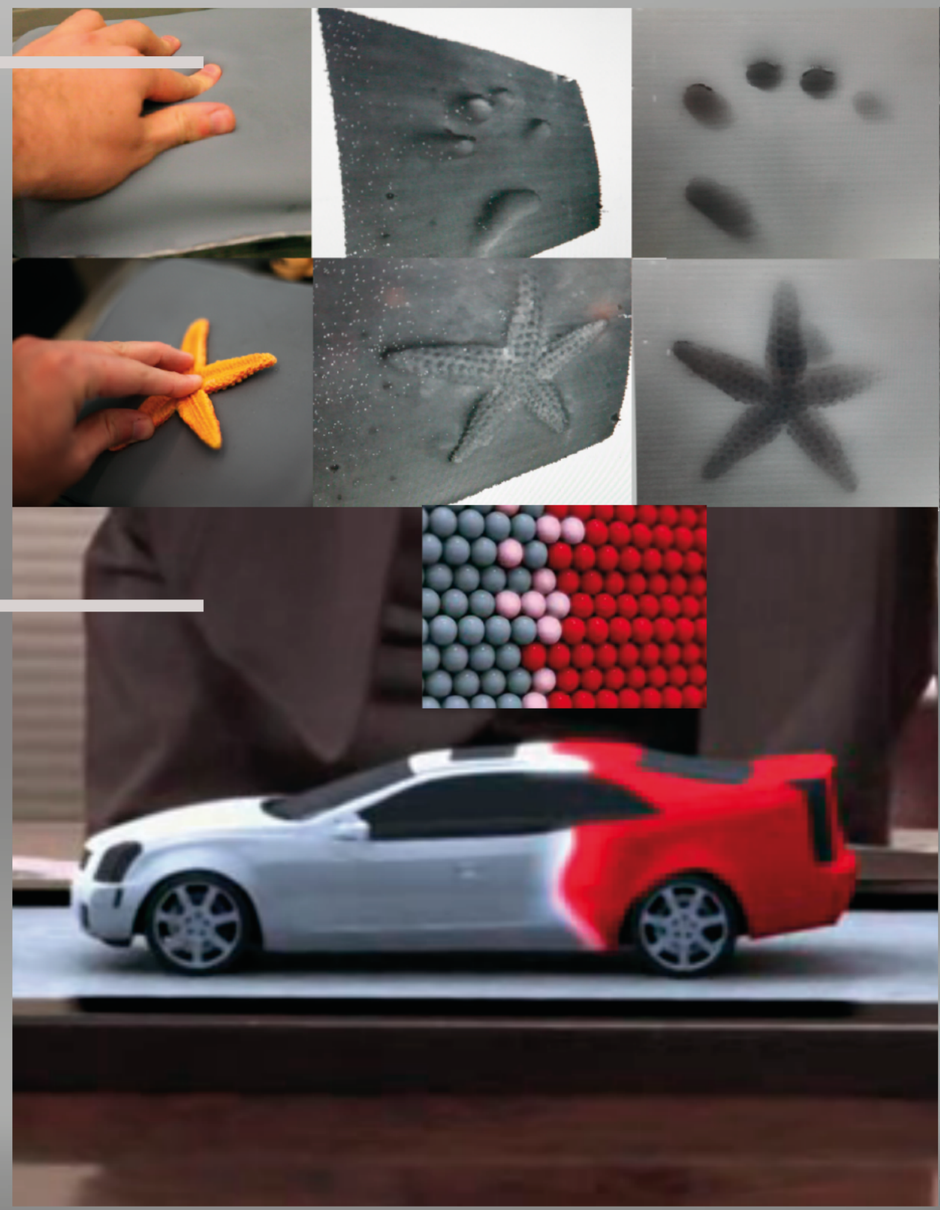
Design Rationale

Design Rationale

Design Rationale

Related Work

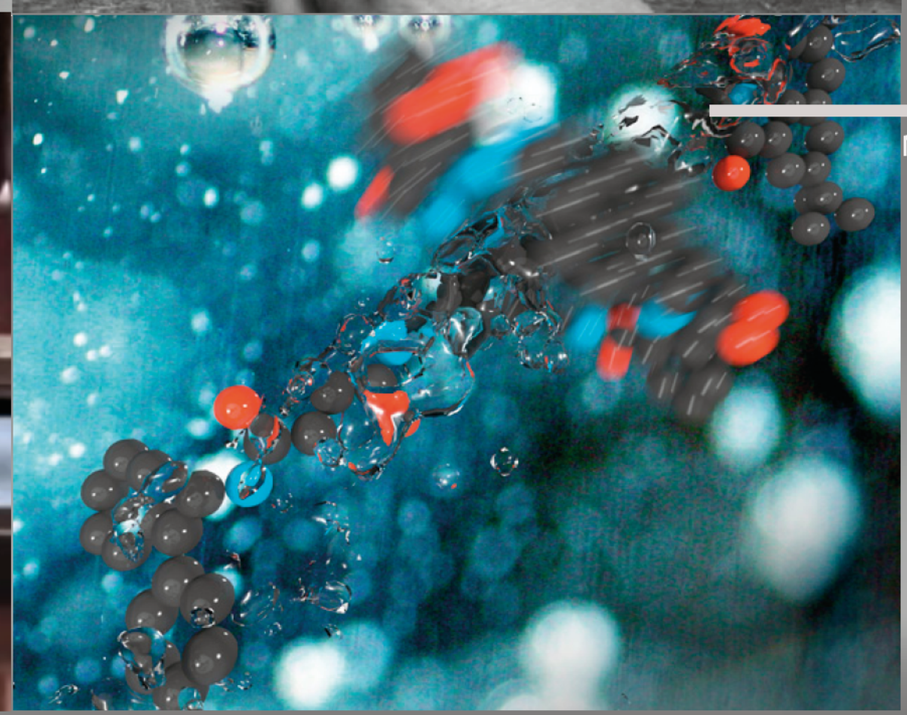
deform



Perfect red

claytronics

NANoMAChines



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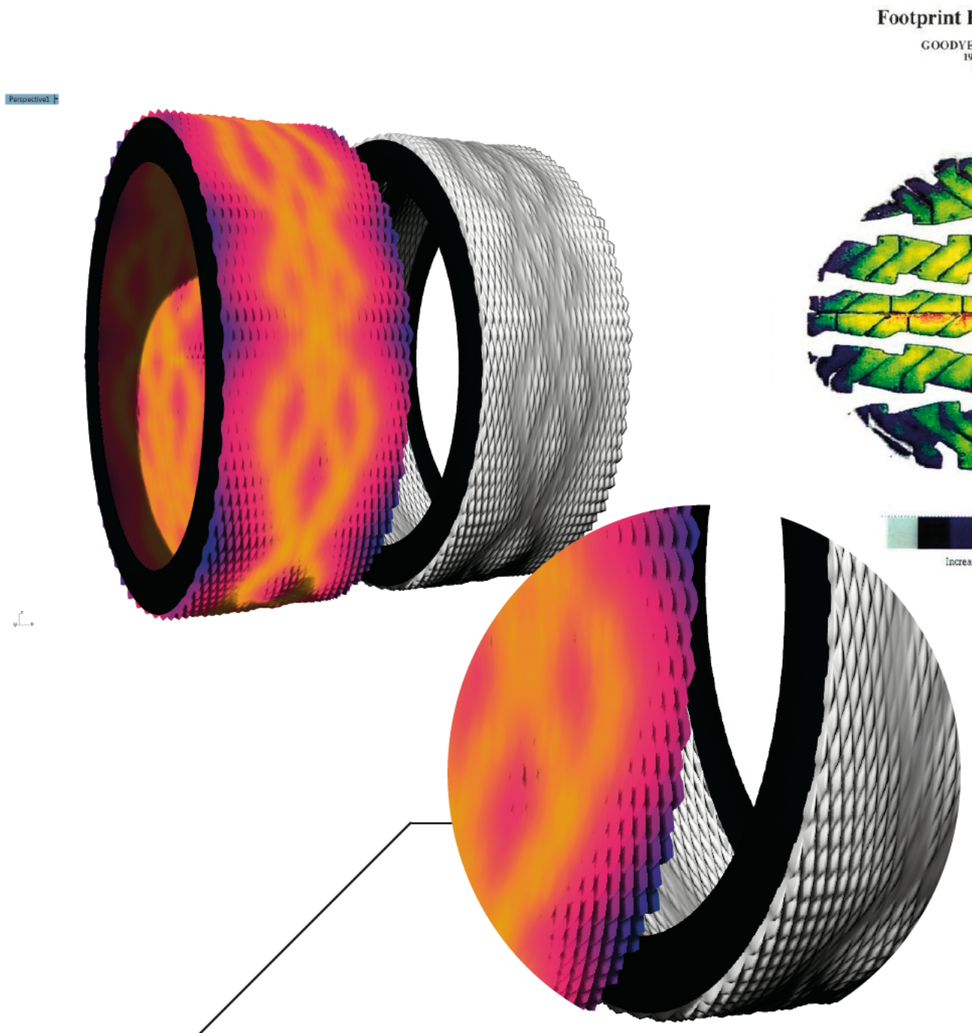
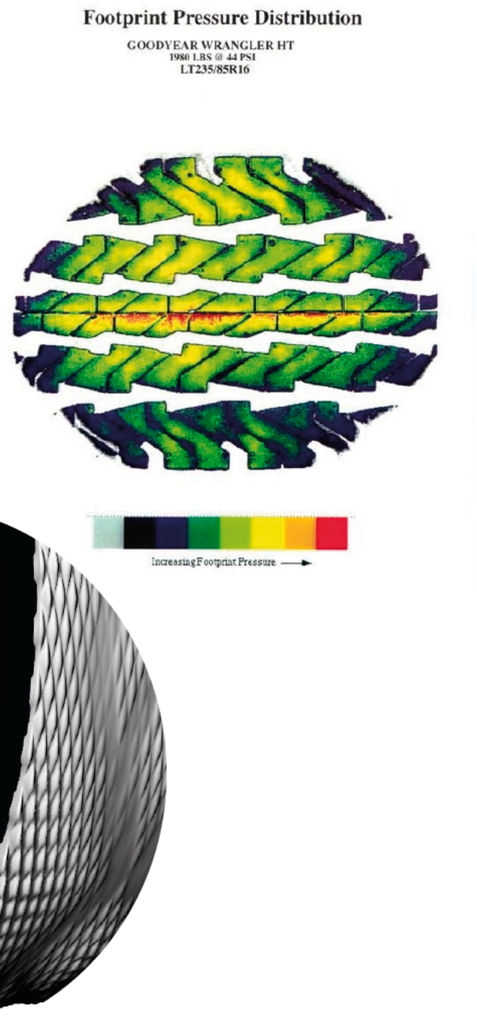
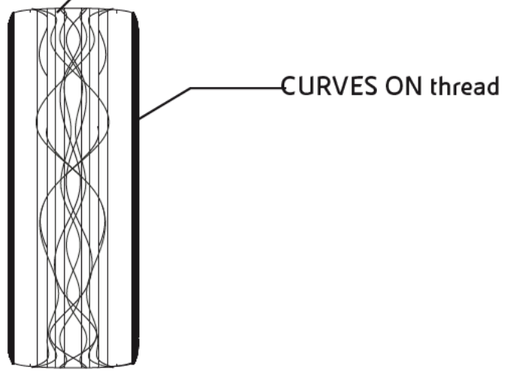
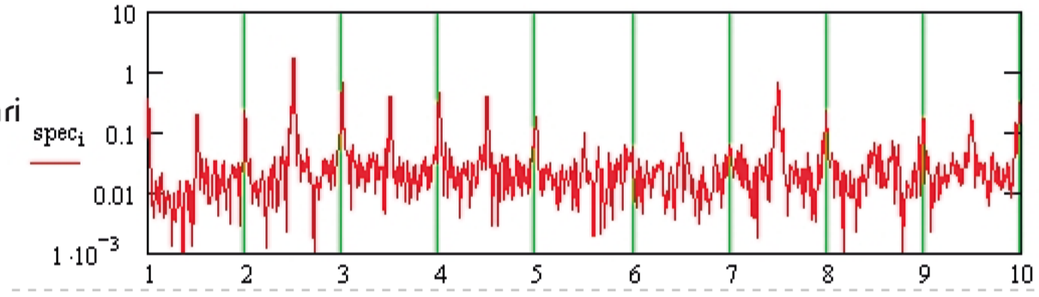






Tonal noises often have harmonics. Here is the noise spectrum of Michael Schumacher's Ferrari at 16680 rpm, showing the various harmonics. The x axis is given in terms of multiples of engine speed. The y axis is logarithmic, and uncalibrated.



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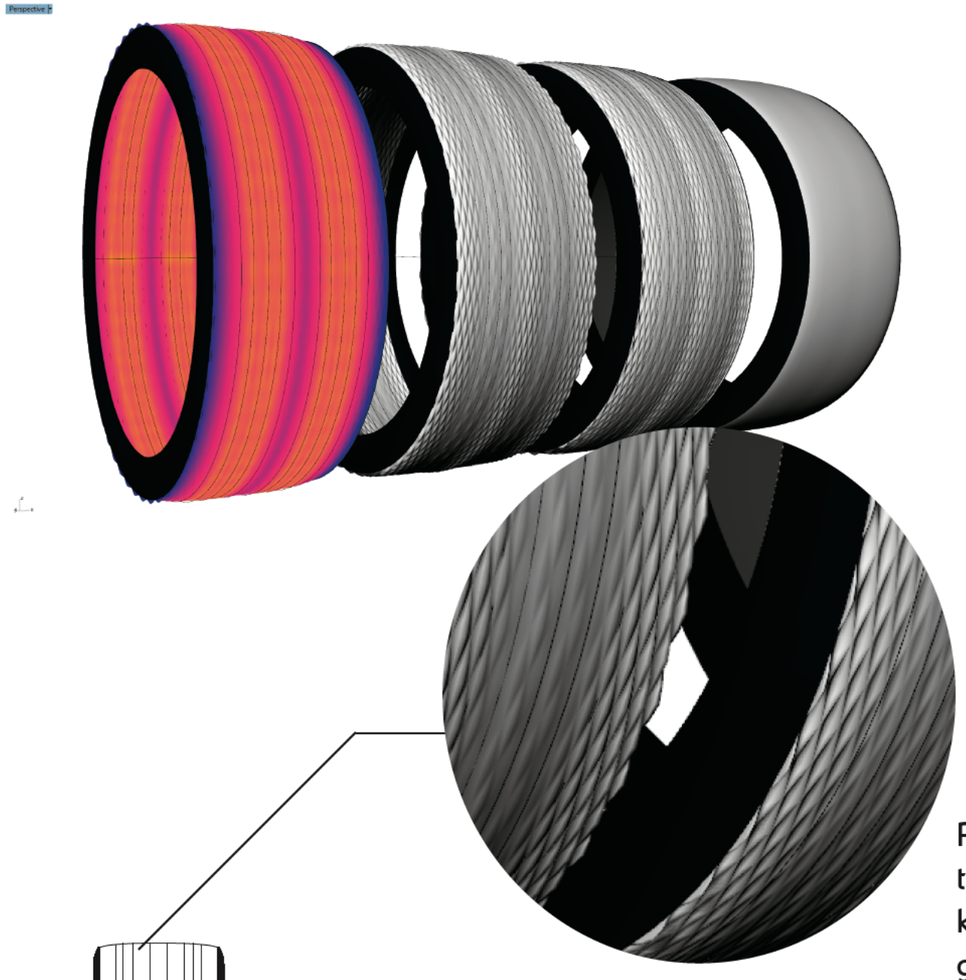
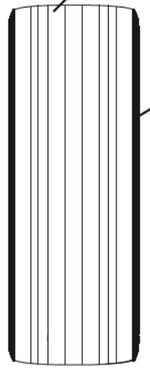
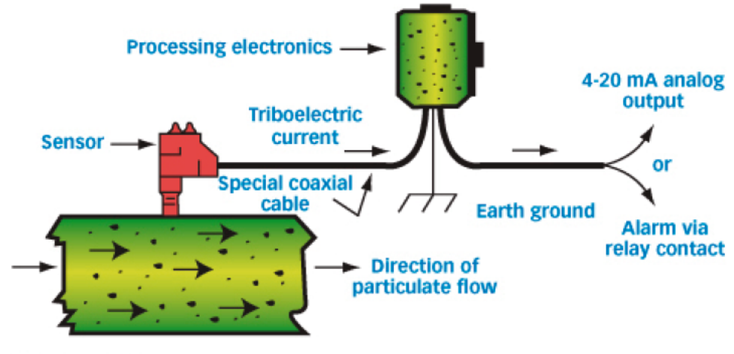




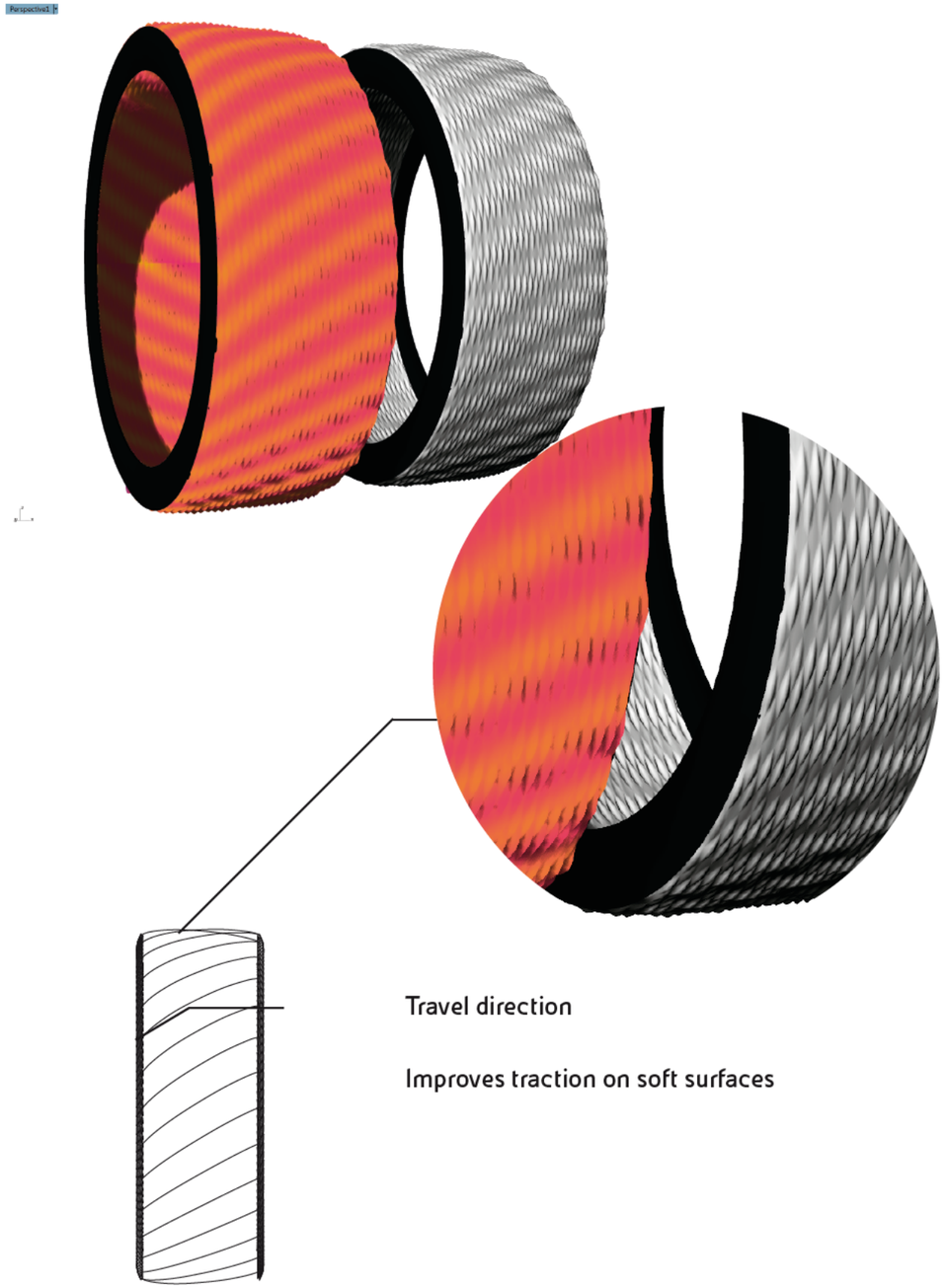
LINEAR direction

Improves performance efficiency thread could be convex or concave depending on the weather conditions

Rubber is a great electrical insulator, which is part the reason that tires store electricity. The rubber keeps the electricity that the tire produces from going to ground through the tread; so it flows through the wheel bearings and body instead. So, why don't all drivers get shocked when they touch the car's body? Because modern tires also contain carbon black, which is a fine electrical conductor. Carbon black routes the electrical charge from the tire down into the road, releasing pent-up energy before it can go through the body.



the triboelectric effect



Travel direction

Improves traction on soft surfaces

A broad flat crown with long deep lugs give the tirea low slip rate and minimal rolling resistance, giving more traction, and resulting in time and fuel savings.

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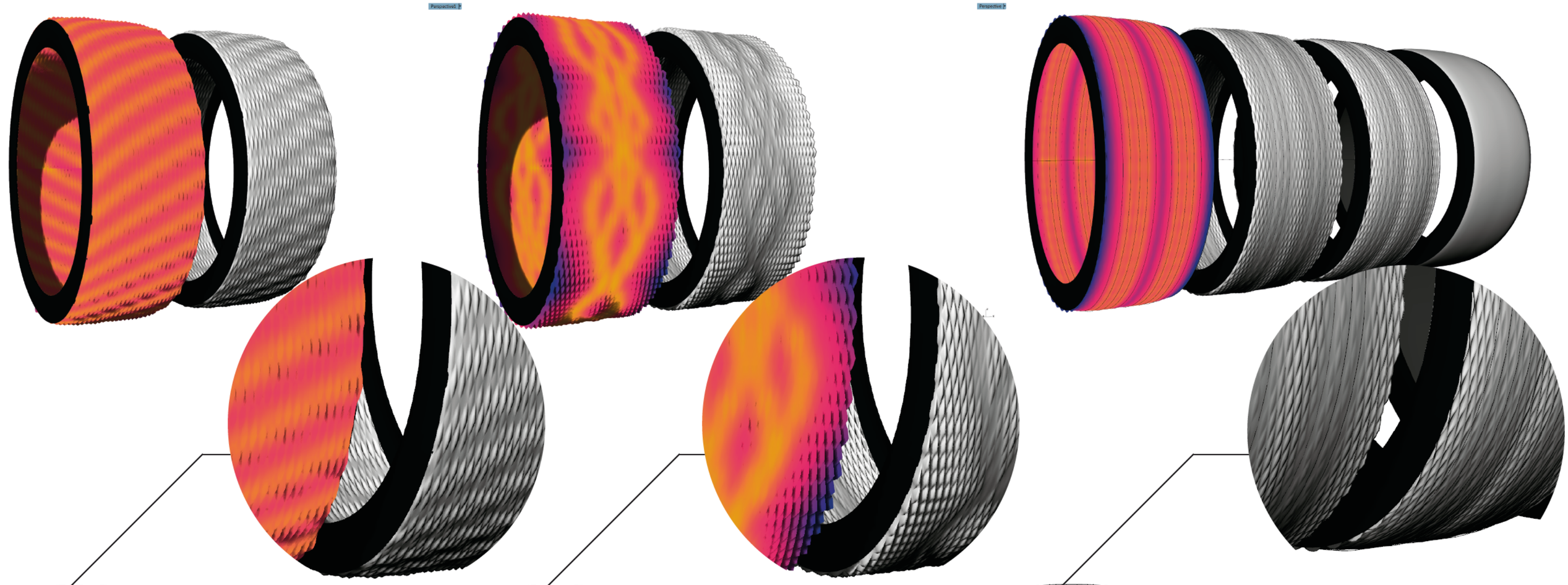
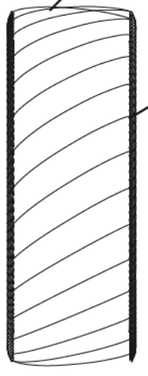
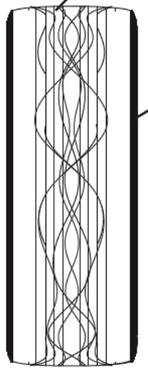




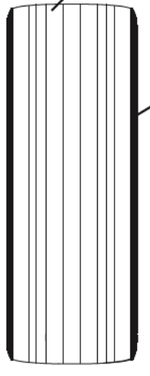
Travel direction

Improves traction on soft surfaces



CURVES ON thread

Improves NOISE ROAD AND MOVES
WATER TO SIDEWALLS



LINEAR direction

Improves PERFORMANCE EFFICIENCY
THREAD COULD BE CONVEX OR CONCAVE
DEPENDING ON THE WEATHER CONDITIONS

δ(μN) Dynamic Friction Polymer

PROGRAMMABLE MATERIALITY

Scenario 2

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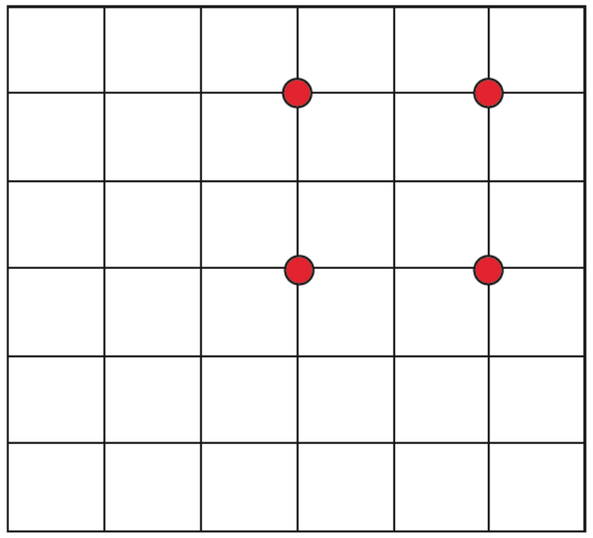
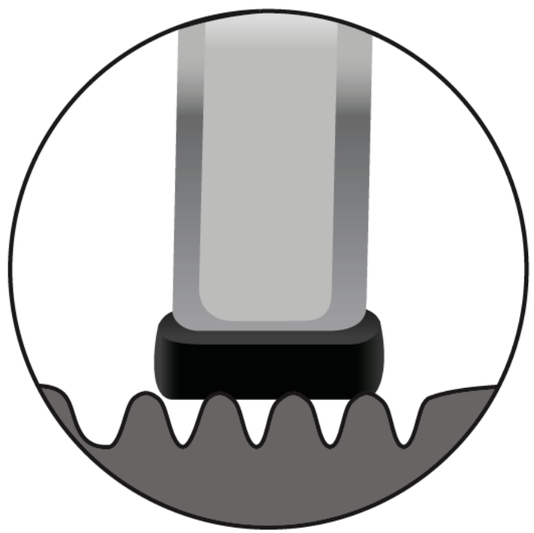
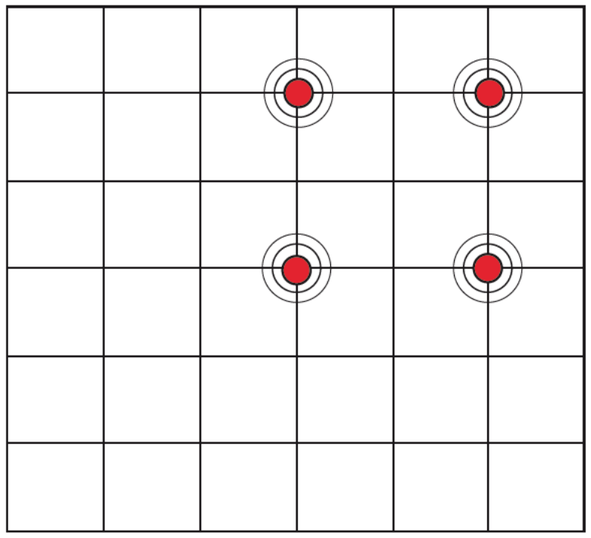
POSITION



Weight = 25lb

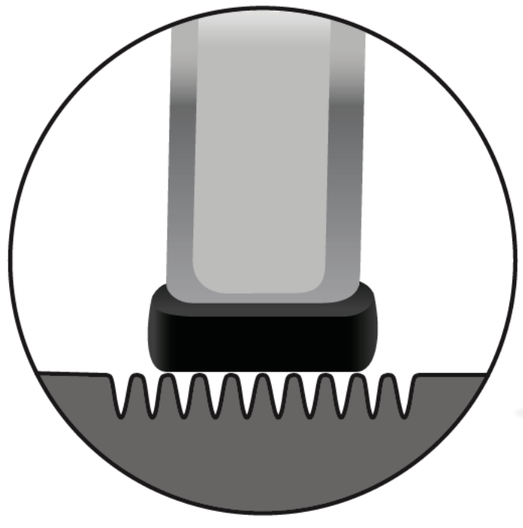


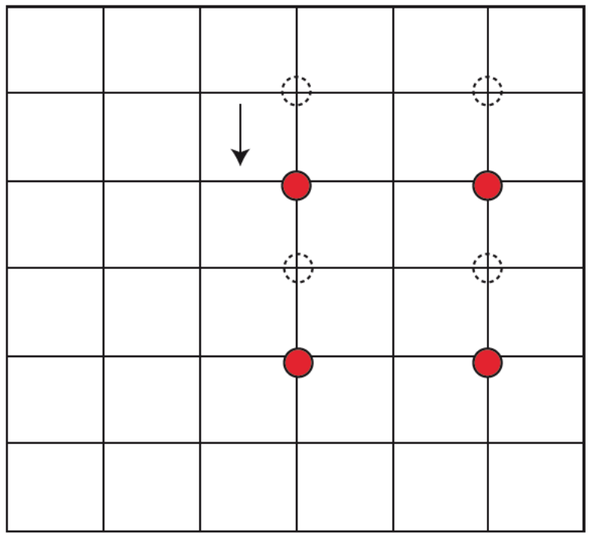
Measuring the weight of the object and it's position on the material



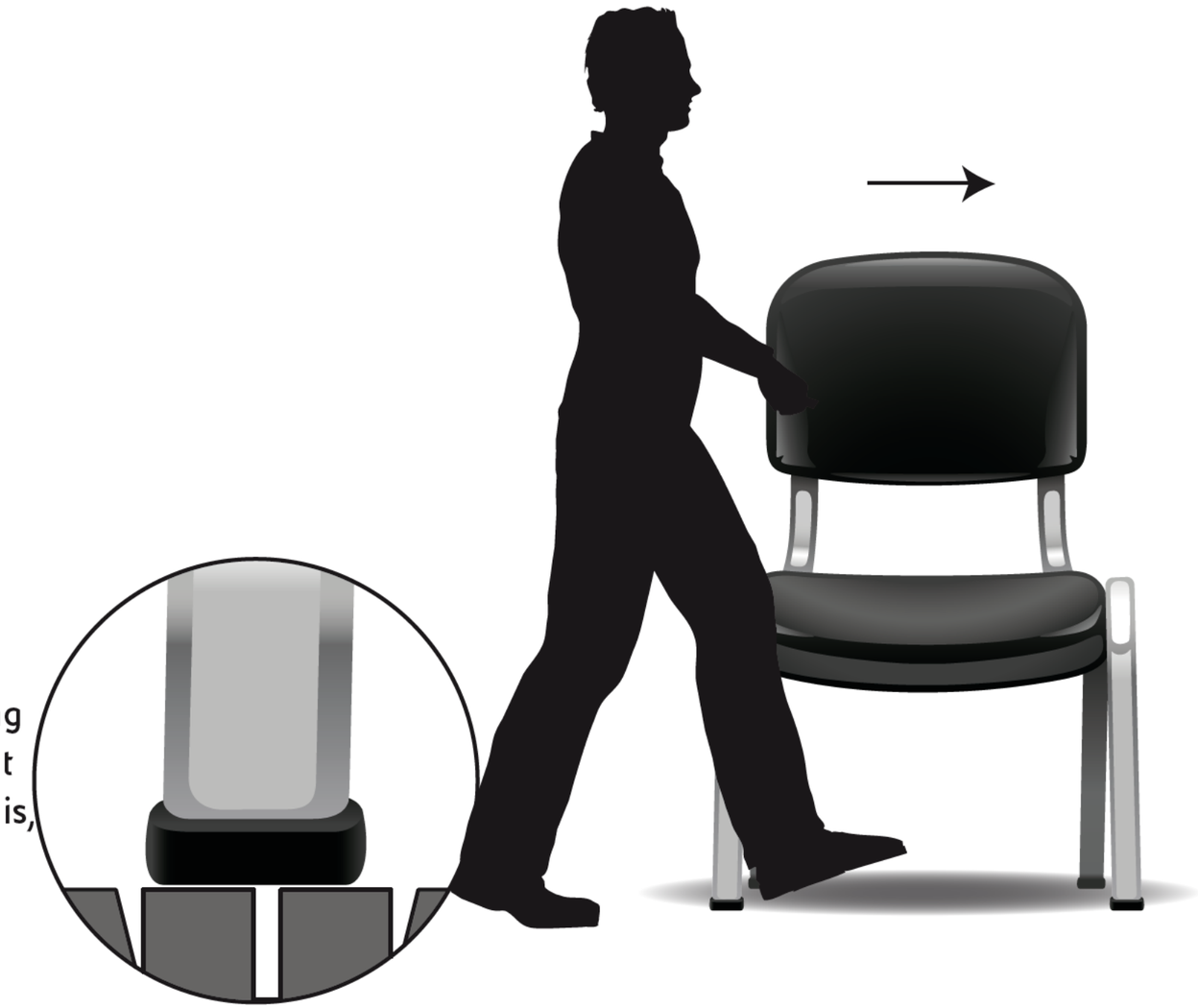
DFM finds an increase in weight, it increases the friction

Weight = 25 lb +
175 lb

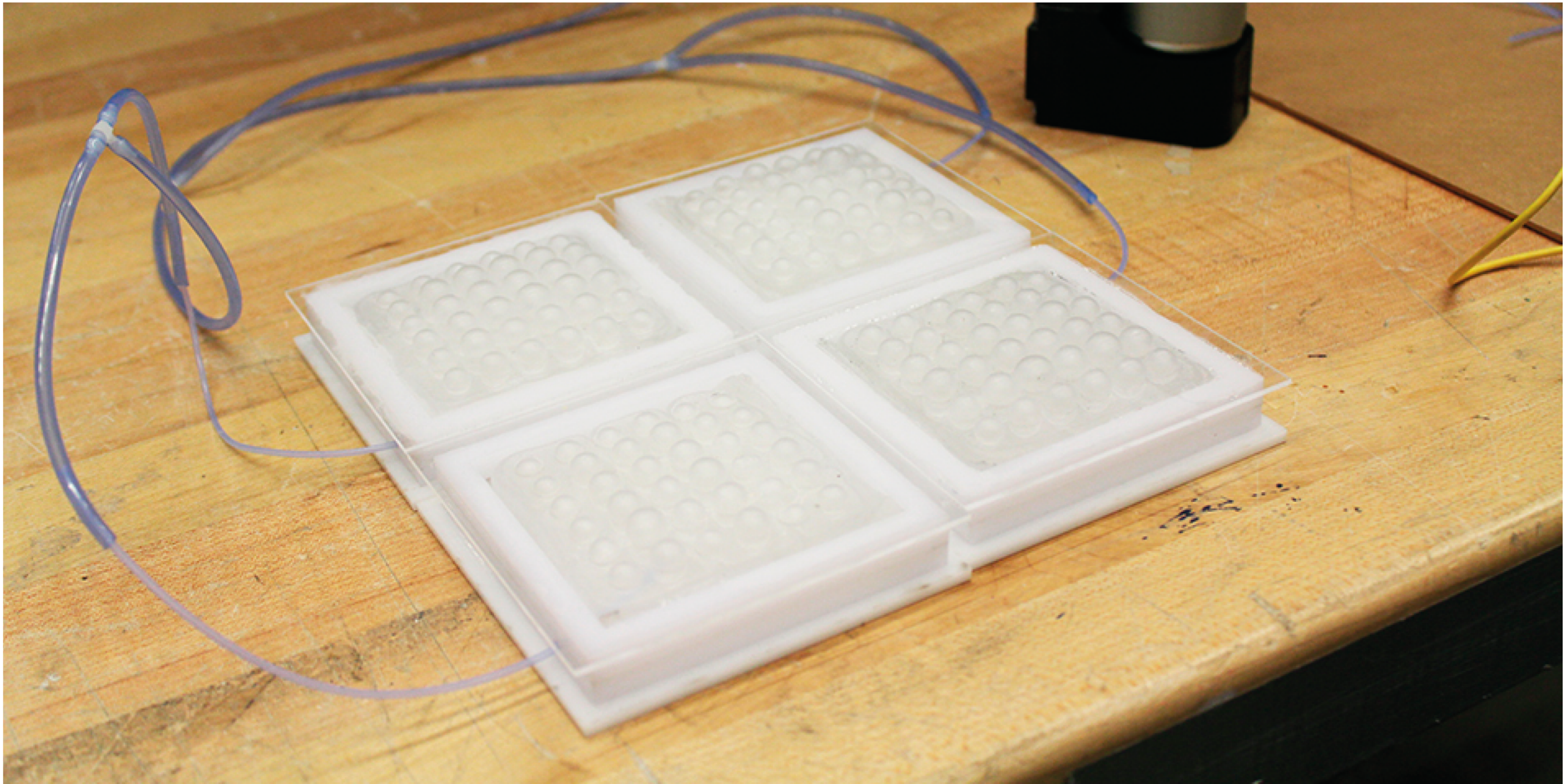




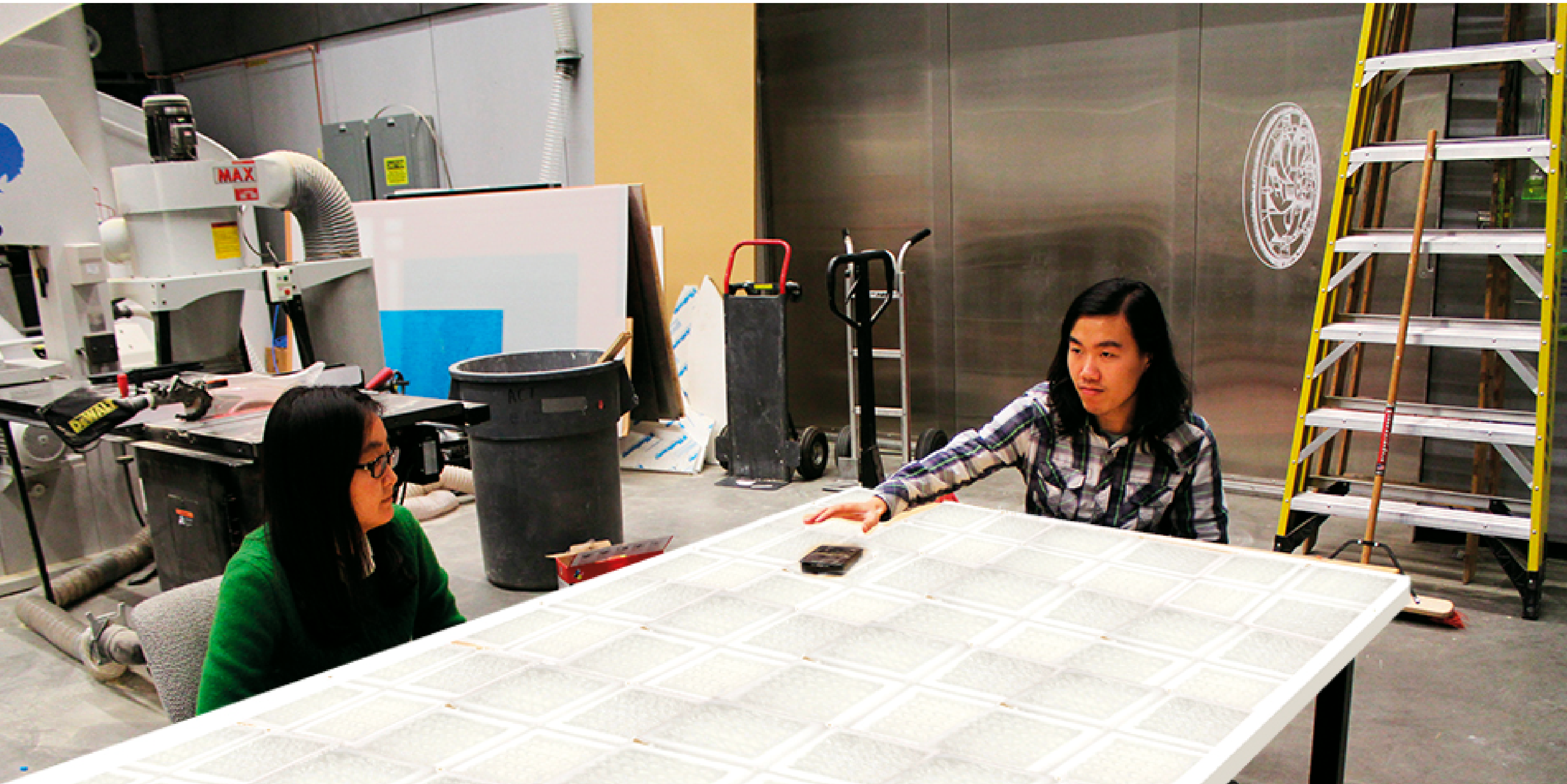
If it finds movement in the object, it decreases the friction while taking into consideration the speed of the movement and the original weight of the object – the faster the movement is, and the heavier the object is, the more friction is reduced.



Demo



Demo



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http://www.michelinag.com
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