# CONCRUENCE

**Congruence**
ˈ***kɒŋgrʊəns*** / noun: congruence
"Agreement or harmony; compatibility."

**Concrete**
ˈ**kɒŋkriːt** / adjective: Concrete
"A building material made from a mixture of broken stone or gravel, sand, cement, and water, which can be spread or poured into moulds and forms a stone-like mass on hardening."

**Manifesto,**

As architects, urbanists and designers, we have worked a lot on public spaces in developing countries. Those spaces are often treated as left over when they are not just designed as highways by civil engineers.

This unfortunate situation can be reversed and we are working to provide tools for the civil society to take over and regain calm and kindness to the city. We are working in the direction whereby we would address designing for public space as we would design for interiors, making sculptural and appealing pieces.

What pushed us into concrete is the fact that it is a raw material entirely made in Lebanon, and because it produces an inert waste, which can be safely used in landfill.

**BITS** TO **ATOMS**

**CG Render.**
The chair is sculptural, low height, generously large, with voluptuous, yet logical, shapes.

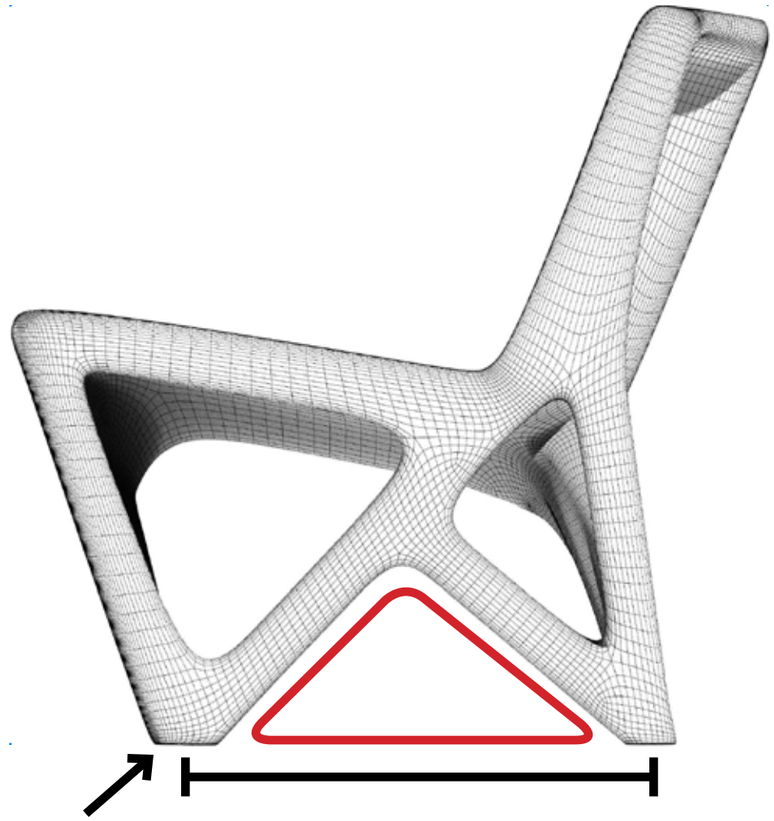
3Dprinted Scale model.

CNC scale 1 mock-up in polystyrene.

Various scales of scale models to check the **iteration** on the geometry.

CNC **scale 1** cut on the 7 axis robot arm, to check size, proportion and sculptural qualities.

CNC scale 1 mock-up for **ergonomic tests** (with comments in red).
We made a second one which was successful. Ergonomic has to be very good because the chair is in concrete and nothing else but good ergonomics will provide comfort.

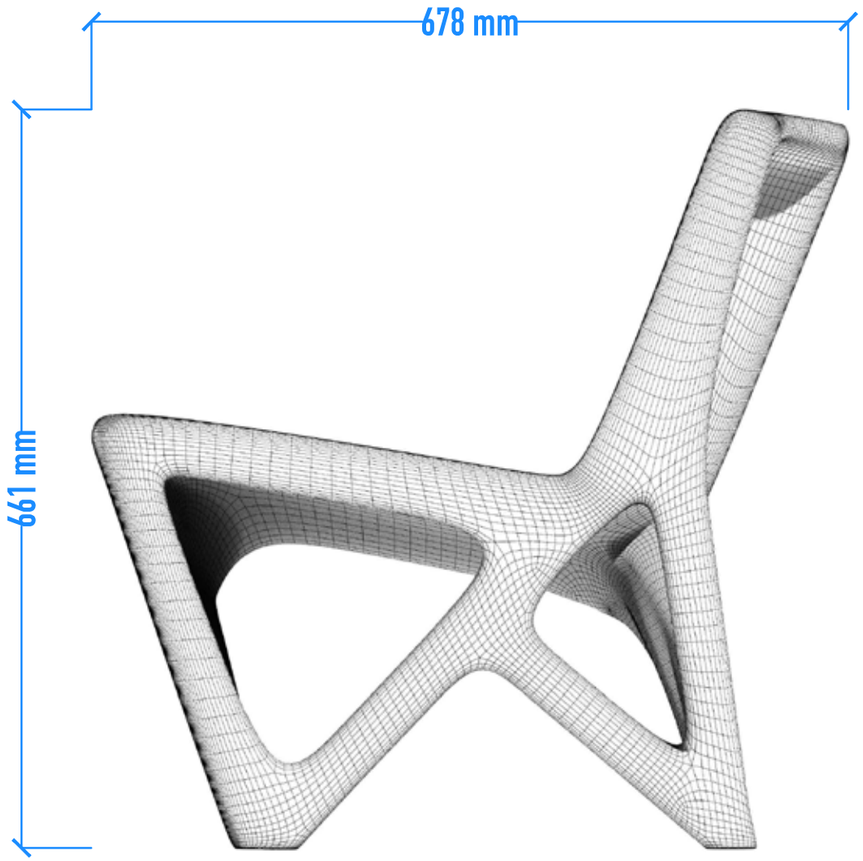


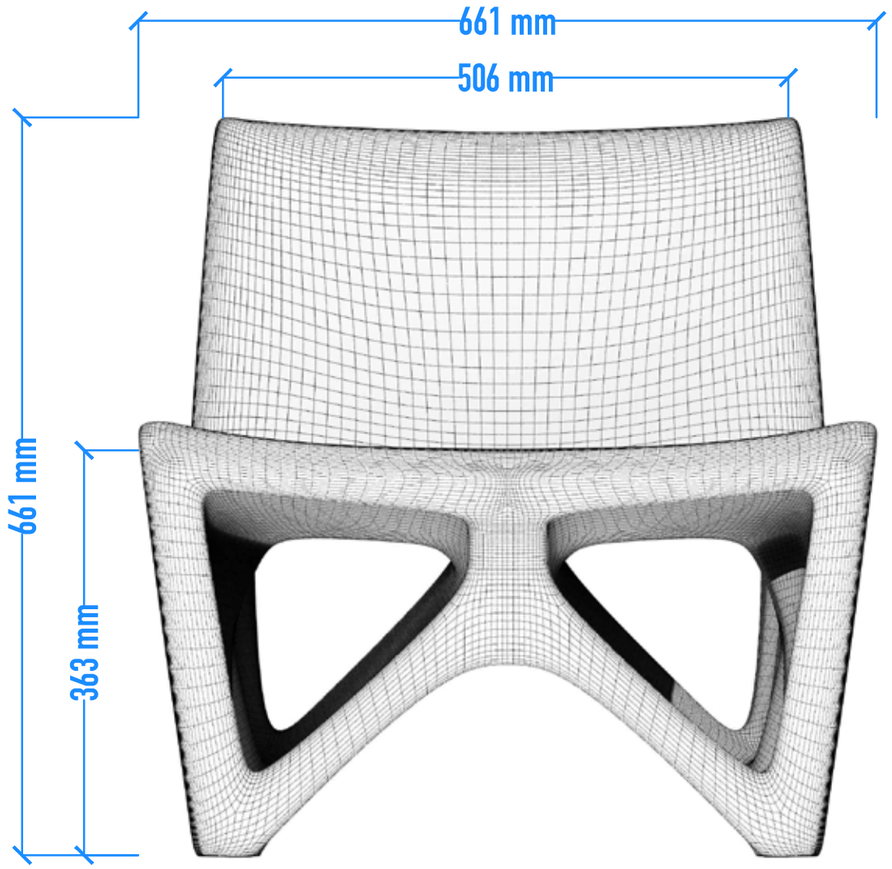
Latex pads ensure a very tight contact with the ground.
Ground works to close the triangle and all elements are in compression.

Minimum thickness is 18mm.

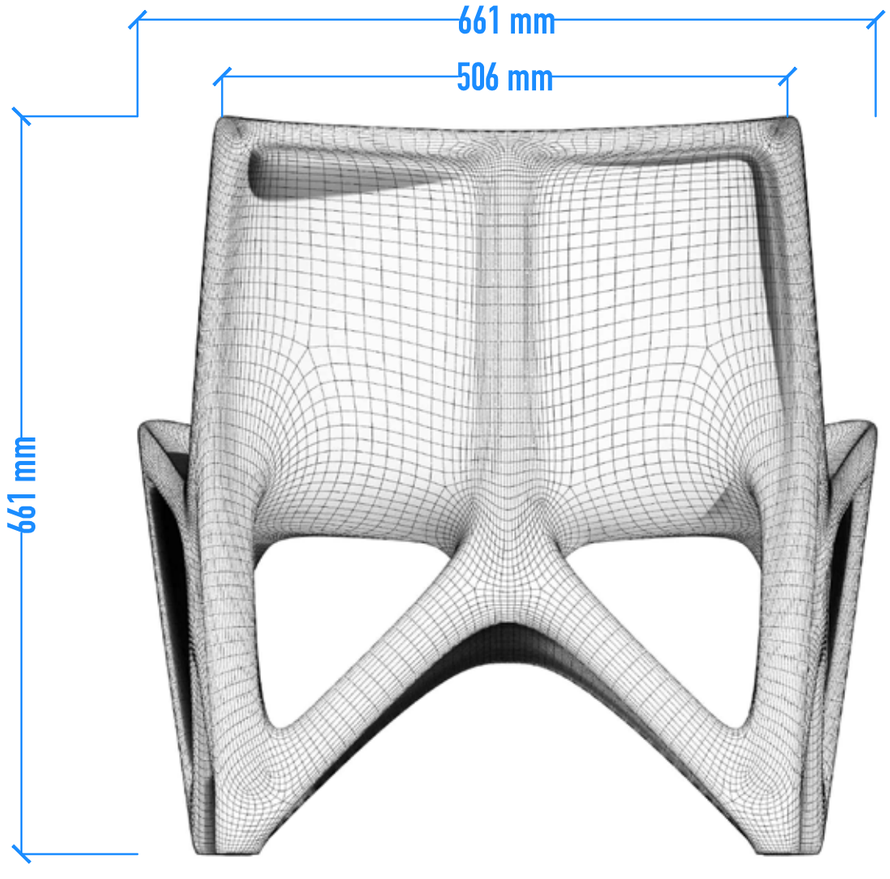
Four metal inserts are laid in the mould before the cast, the chair would be sold with two sets of four tips for the feet: one adhesive rubber (for indoor and fragile ground) and one stainless steel sharp pin (for outdoor and soft grounds)

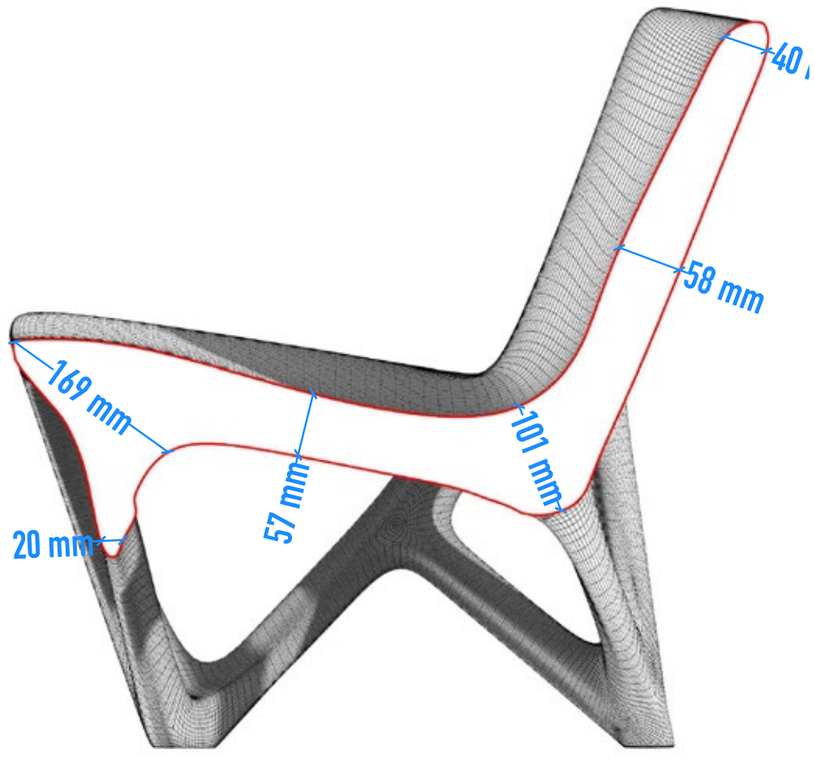
The estimated weight for the chair is about 30kg. It is envisaged as an outdoor chair that do not move much, but it can also find its place indoor where its sculptural quality can shine.



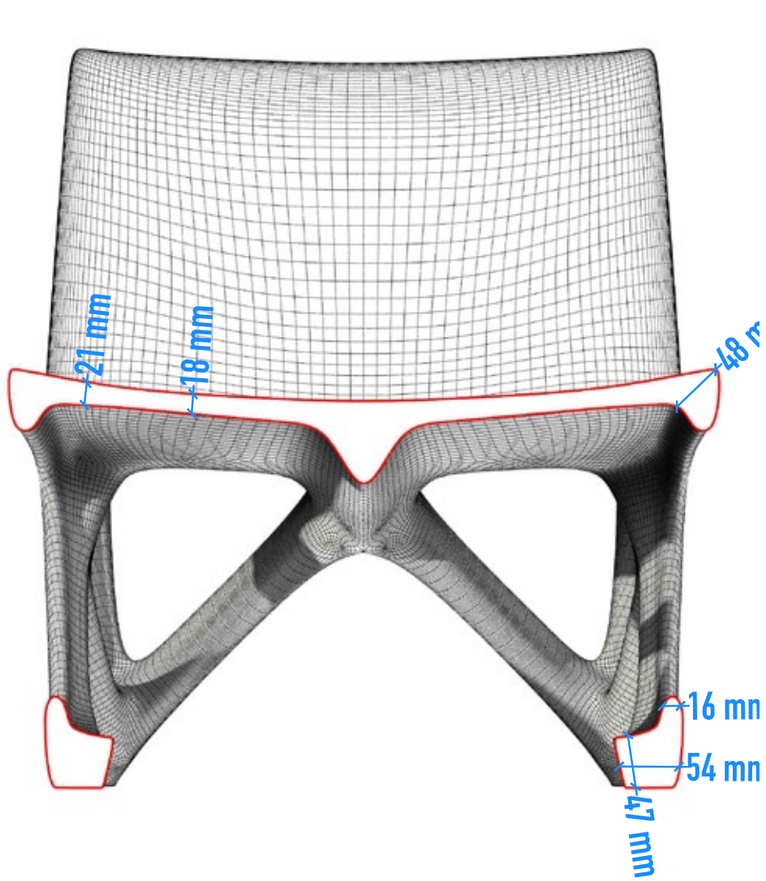



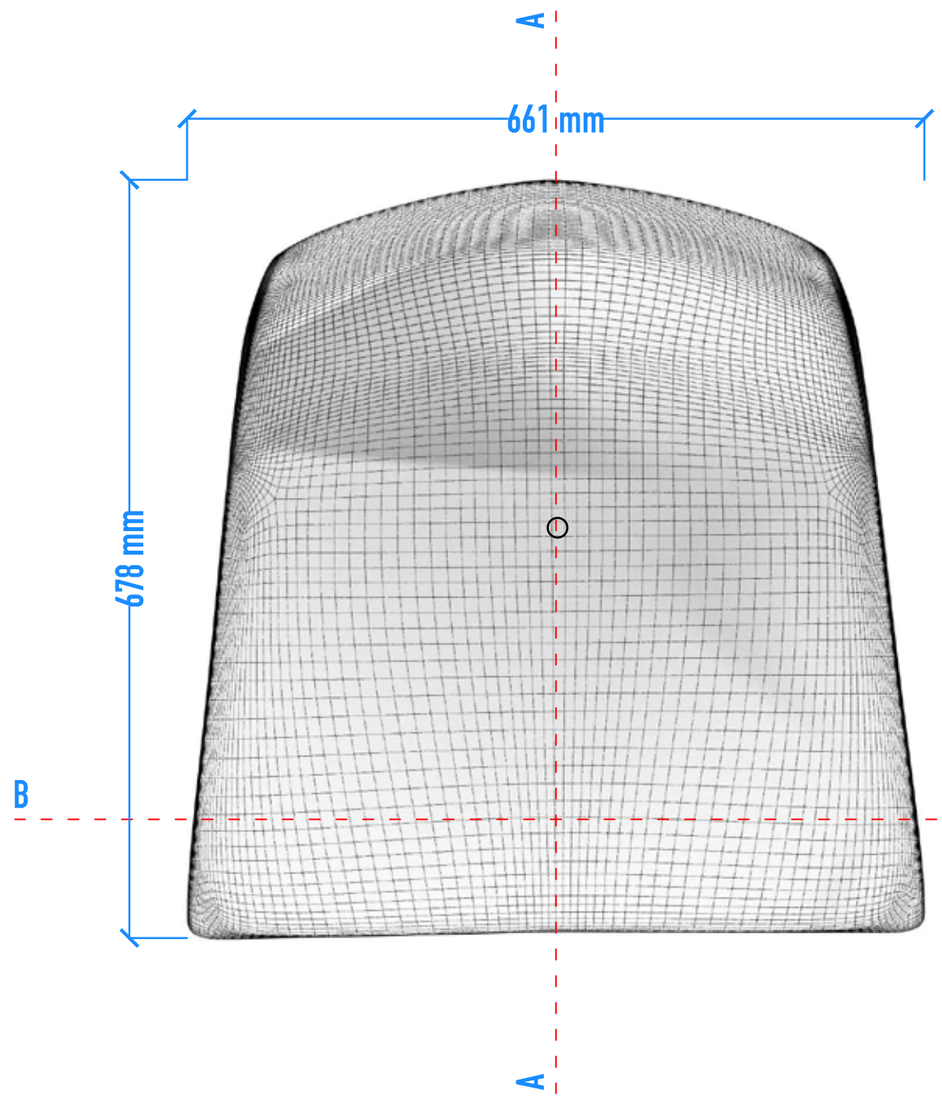
**Strength** is obtained by geometry, a **spine** and **stiffeners**, smoothly integrated in the sculptural shape, are providing the needed beam height at the structurally logical points.



A hole in the water collecting point allow the evacuation of rain water for the chair to support all year long outdoor.
The top surfaces being on the bottom during the cast: they are the less porous, this will give a long lifespan to it, even in freezing regions.



CNC **scale 1** cut on the 7 axis robot arm, of the final Master that will be used to make the latex mould for the production.

Saw dust from insulation is re-used as insulation to be poured in unreachable place. A local company is reselling it to clients.

The master for the mould is worked by hand for a long period using car body paste and all the technique of car bodybuilders.

Several layers of paste and paints are hand sanded in an ordered manner: from rough to very fine, in order to create a very smooth and uniform surface.

The final master is sanded with 2000 grit paper under water.

We have experience in the **casting process**, having done complex moulds using silicon, built our own **vibrating table** and **degassing chamber** to get the best result possible.

*CNC wood master,*

*Painting,*

*Silicon mould,*

We have made various researches wit**h fibre enhanced concretes.**

The **colour, the strength, the porosity** have been worked out in order to give better results on several project we conducted, including a very extensive production of tiles.

Concrete is one of the rare raw material entirely made in Lebanon.

It produces an **inert** waste at end of life, that can be used safely in landfill. But because we use fibres instead of glass, it can also be **recycled** as aggregate in other concretes.

# BITS TO ATOMS

**Bits to Atoms** is an **architecture** and **design** practice established in **Lebanon** since 2012, led by Guillaume Crédoz.

The practice is focused on **Digital fabrication** in association with **traditional techniques** using **sustainable** materials to obtain **affordable designs**.

Guillaume has created the Design Collective: **Beirut Makers**, which has been exhibiting since three years and now regroups about twenty designers. The association is regrouping senior and junior designers, helping another in the exploration of **digital fabrication in the Lebanese context.**

He has received several awards, including the Harper's Bazaar **best emergent designer** award in 2017, he has exhibited as a featured designer in **Dubai Design Days** in 2014 and at the **Biennial of Design of Saint-Etienne** in 2017.

With **Bits to Atoms** and **RapidManufactory** he has made available industrial SLS 3Dprinting and 7 axis robotic fabrication to Lebanon, helping the creative community to get access to manufacturing tools otherwise out of reach.