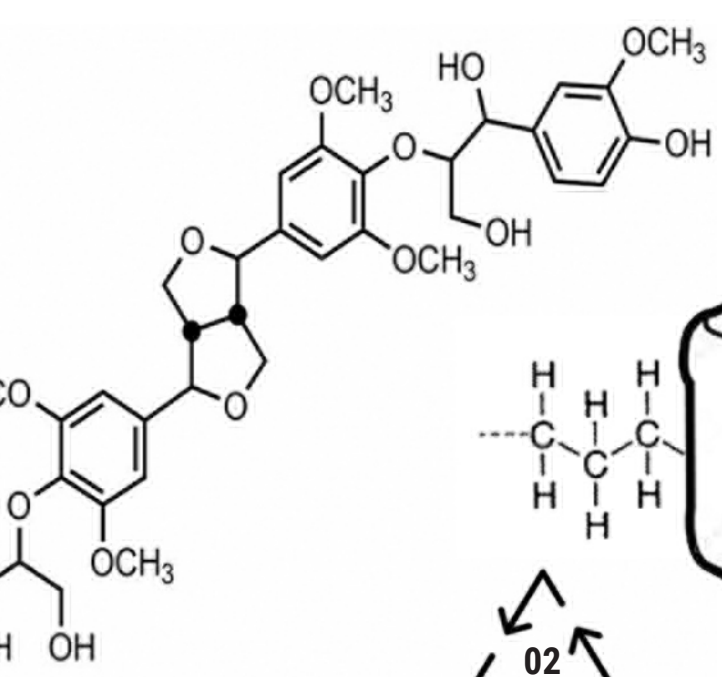
m i n i p o g o n

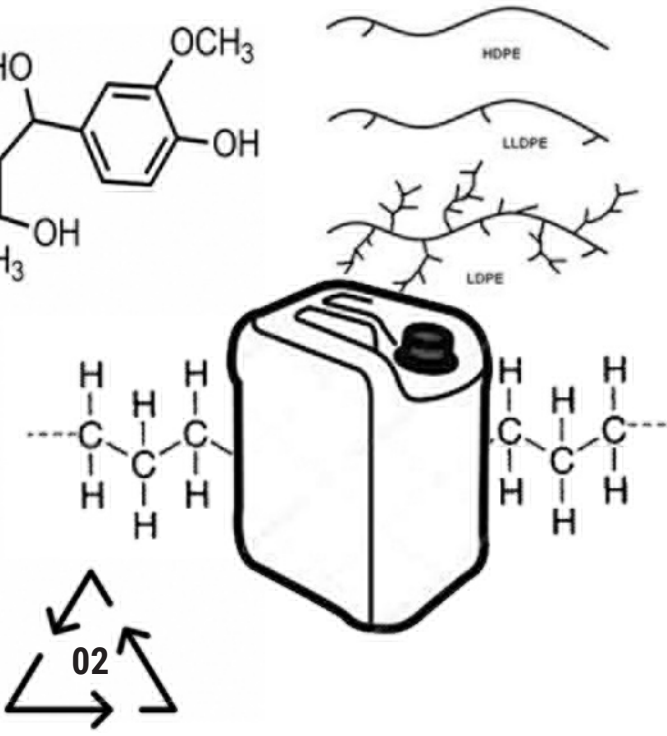
(user manual)

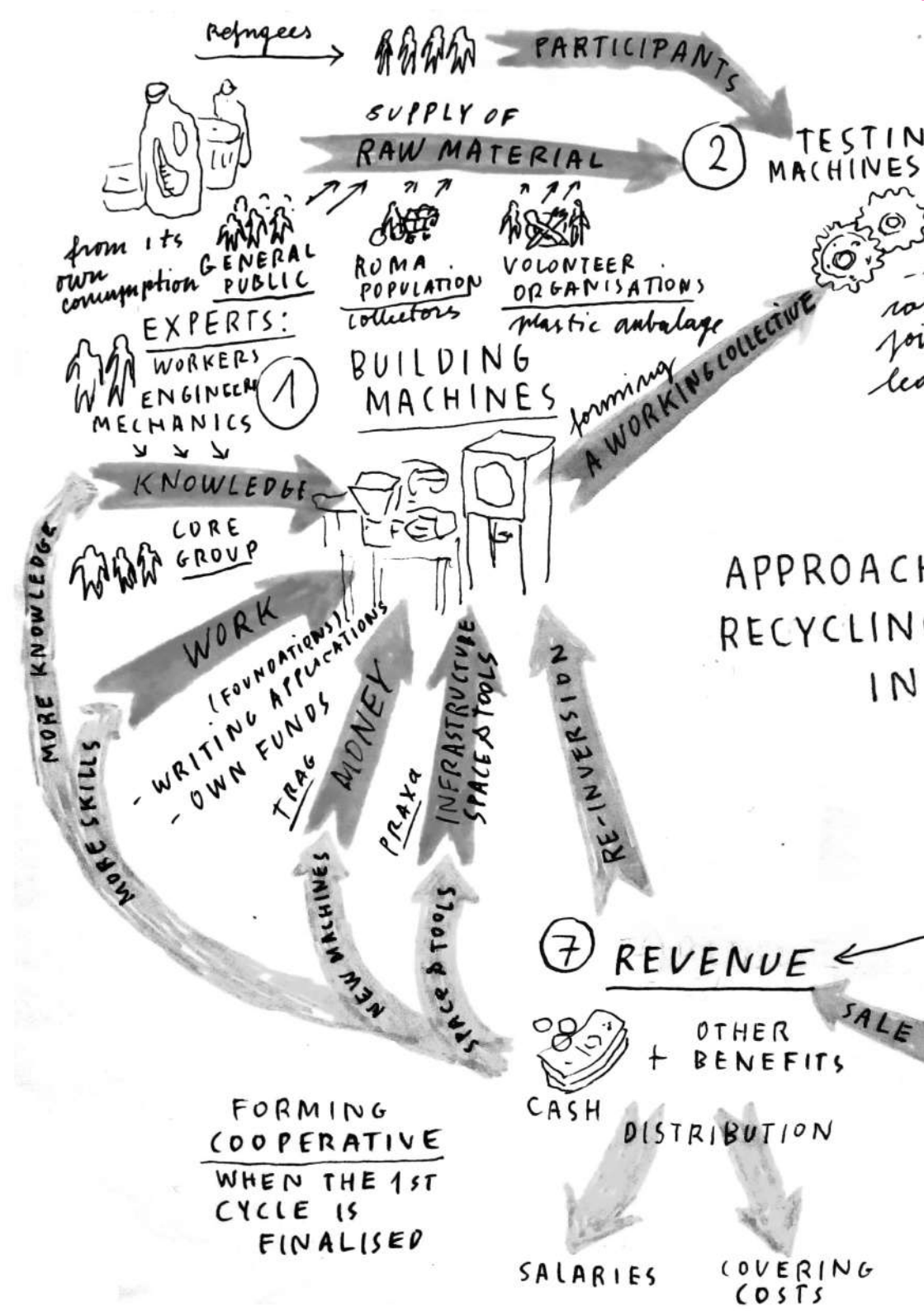
2nd edition *Feb / 2019*

Krnjača *Miksalište*

towards equality
through collaborative
productive work






Refugees
PARTICIPANTS
SUPPLY OF
RAW MATERIAL
2
TESTIN
MACHINES
from its own consumption
GENERAL PUBLIC
ROMA POPULATION
collectors
VOLONTEER ORGANISATIONS
plastic ambalage
EXPERTS:
WORKERS
ENGINEERS
MECHANICS
1
BUILDING MACHINES
forming A WORKING COLLECTIVE
KNOWLEDGE
CORE GROUP
APPROACH
RECYCLIN
IN
WORK
(FOUNDATIONS)
- WRITING APPLICATIONS
- OWN FUNDS
TRAG
MONEY
PRAXA
INFRASTRUCTURE
SPACE & TOOLS
RE-INVERSION
MORE KNOWLEDGE
MORE SKILLS
NEW MACHINES
SPACE & TOOLS
7
REVENUE
SALE
OTHER
+ BENEFITS
CASH
DISTRIBUTION
SALARIES
COVERING COSTS
FORMING COOPERATIVE
WHEN THE 1ST CYCLE IS FINALISED

- test & try
- tweaking & improving machines

& LEARNING TO USE THEM

MAKING MANUALS

- OPEN SOURCE MANUALS
- PDF/PRINTED

DISTRIBUTING MANUALS

WORKSHOPS

- DESIGNED FOR DIFFERENT GROUPS & CONTEXTS

PRODUCT? (VALUE)

BUSINESS PLAN

forming a
llective through
nt work and
rning

③ DESIGNING PRODUCTS & PROTOTYPING

YOUNG CREATIVES

PRODUCT STRATEGY

- what are the needs?
- what are the possibilities? (technological limitations)

- DIVISION OF LABOUR PRACTICAL/INTELECTUAL
- GROUP WORK/SELFORGANIZ.
- EVALUATION

HING PLASTIC
G COOPERATIVE
7 STEPS

PRO-ORGANISATION

④ PRODUCING MOULDS & CASTING

- TECNOLOGY AND PRACTICAL SKILLS TEST & TRY

DUCTION

⑤ PRODUCTION & FINISHING

BUSINESS & ECONOMY EXPERTS

FINAL OBJECT

GIVING AWAY/ EXCHANGING

GOING PUBLIC

STORY

USE VALUE

BRANDING?

TYPE MARKS

⑥ GOING TO THE MARKET? - or not

SERIES

MARKET OFFER

SHOP

- DISTRIBUTION PLACES & MEANS
- ADVERTISMENT?
- CUSTOMERS FEEDBACK

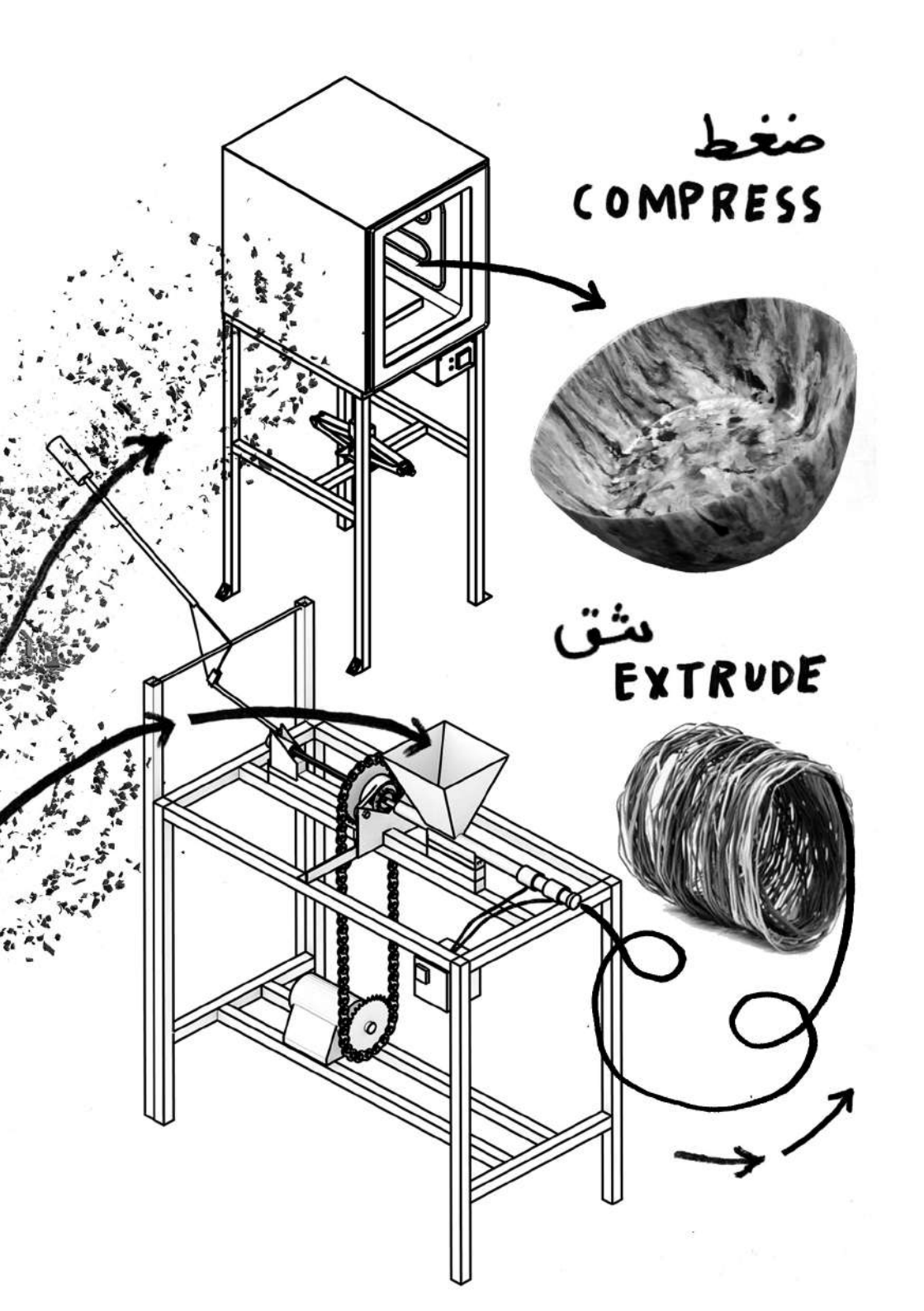
CUSTOMERS

MARKET VALUE?

plastic products are mass produced, and cheap to replace by the consumer, resulting in large amounts of disposed plastic. this creates an environmental problem

how we could make plastic valuable again? and how we could reorganise the processes of producing and using things?

... maybe by building our own means of production, new working relations, new economy...


ضغط
COMPRESS
شق
EXTRUDE

BUILDING SHREDDER / بناء الممزق

3

hmmm, i would prefere that we follow the instructions for the moment, unless we have really good reasons to modify them

2

oops, the bar is a bit shorter

4

but everything is almost fitting...

hexagon bar
modified
25eur

شريط مداسى الزوايا

shredder box
stainless steel
& regular steel
lasercut parts
all 85euro
+shipping

صندوق الممزق

1_the shredder box

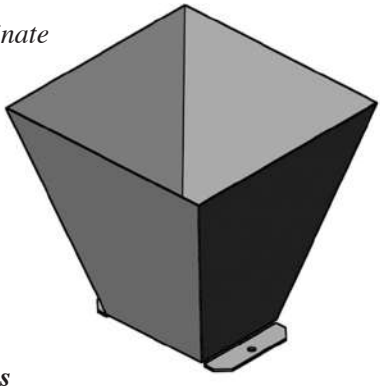
صندوق الممزق

1

oh! the holes came out a bit moved, but i think it's ok

hooper
2mm laminate

هوبر

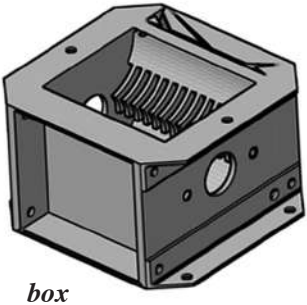


Shredder
Box Assembling

2 bearings
type UCFL204

blades
stainless steel

سكاكين

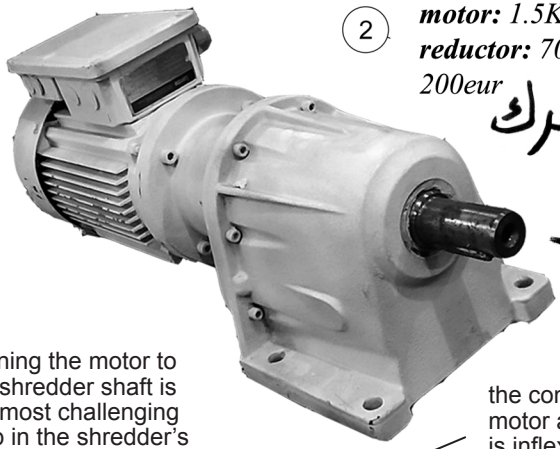


صندوق

box
regular steel

*download link for the blueprints - https://preciousplastic.com/en/videos/download.html

BUILDING SHREDDER / بناء الممزق



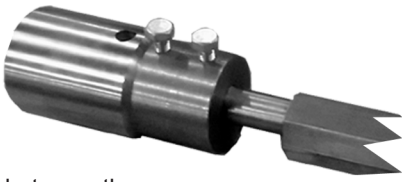
2

motor: *1.5KW (2HP)*
reductor: *70rpm*
200eur

محرك

3

motor to shredder ***shaft connector*** **hard conn.*
60eur



aligning the motor to the shredder shaft is the most challenging step in the shredder's construction because it needs precise positioning

the connection between the motor and the shredder shaft is inflexiblle, thus correct alignment is necessary to avoid damage

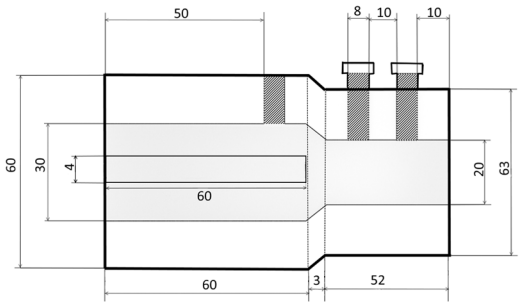
4

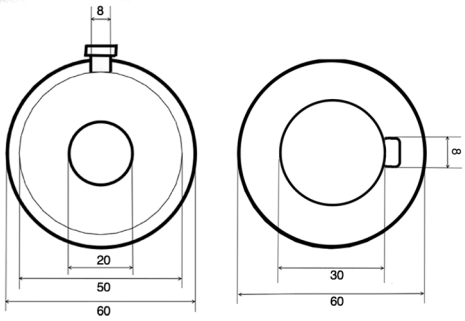
(compulsory use of the goggles while grinding)

1

2_framework & motor connection

الإطار والاتصال المحرك

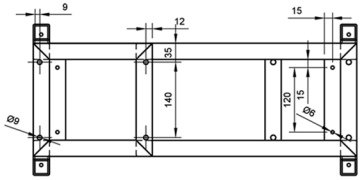


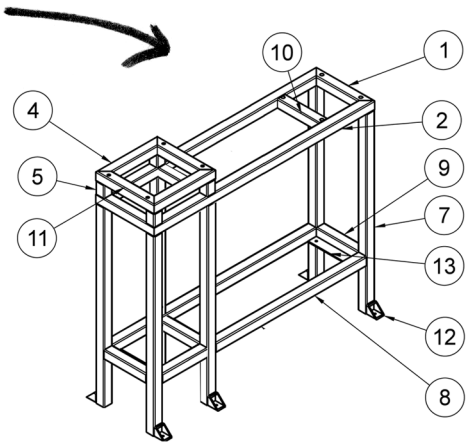


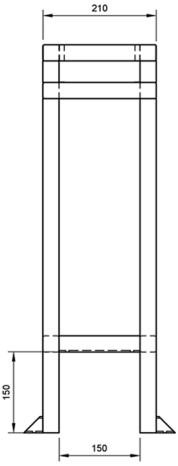
Item	Qty	Part Number	Description	Material
13	2	Flat 30x30x3	L=150	Steel
12	4	Tube 30x30x3 (6)	L=35	Steel
11	2	Tube 30x30x3	L=210	Steel
10	1	Tube 30x30x3 (4) (1)	L=150	Steel
9	2	Tube 30x30x3 (4)	L=150	Steel
8	2	Tube 30x30x3 (3)	L=540	Steel
7	4	Tube 30x30x3 (2) (2)	L=620	Steel
6	2	Tube 30x30x3 (2) (1)	L=40	Steel
5	2	Tube 30x30x3 (2)	L=40	Steel
4	2	Tube 30x30x3 (1) (1) (1)	L=221	Steel
2	2	Tube 30x30x3 (1)	L=600	Steel
1	2	Tube 30x30x3	L=210	Steel

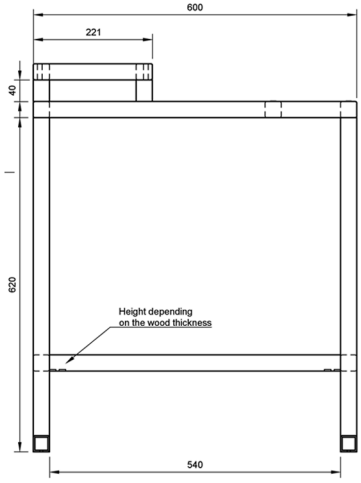
Electronics
Motor connector

Framework









MATERIAL / مواد

the shredder is ready and we are taking it to miksaliište* where we will use it...

oops, one wheel just broke

*the **wheels***

must be rated to bear the weight of the shredder; our shredder weighed around 100kg and we broke 2 sets of wheels because we bought the wheels by eye

نقل
TRANSPORTING

(the poster announcing the opening of the workshop was displayed around the neighborhood)

plastic recycling workshop

mini pogon

WORKING HOURS:
Wednesdays
from 4pm to 7pm

1st session / Wed. April, 25th
collecting & shredding
plastic types HDPE (2) & PP (5)

***miksalište** - a refugee day center in Belgrade

كسر
BREAKING

this work is fun!

فرز
SORTING

the motor can be reversed in case of a jam in the shredder

bigger plastic pieces have to be broken up to avoid jamming the shredder

variable frequency drive
adapts motor for residential electricity and controls the rotation of the motor - 150eur

sometimes the plastic type mark is so small that is hardly visible

1_sorting & cleaning

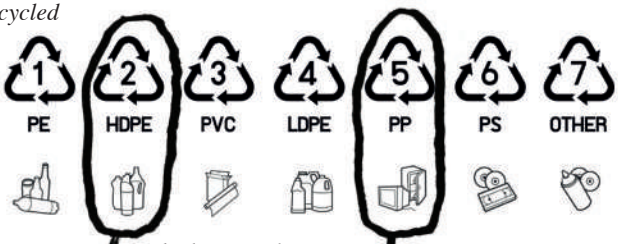
الفرز والتنظيف

all plastic items belong to a particular type of plastic and are labeled with the appropriate number and abreviation so that they can be recycled

plastic typology chart ---->

&

most common applications -->



the best results are obtained from HDPE (2) and PP (5)

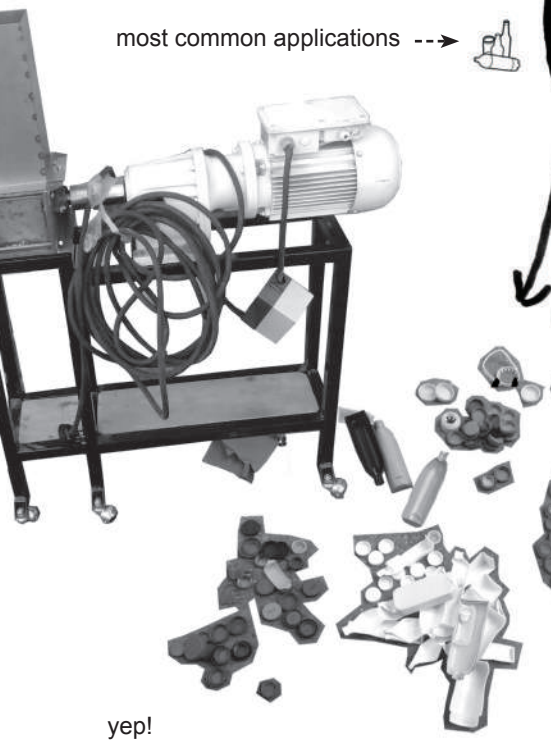
and them we are using

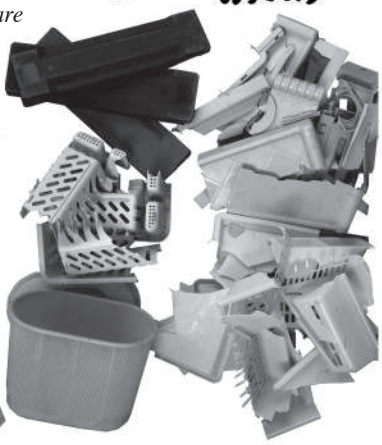
PP

VARIOUS PLASTIC OBJECTS

MOSTLY BOTTLE LIDS

HDPE





yep!

yes, but till then we have to do all this work manually

i would rather wash it in the washing machine...

& make plastic recognition detector

WASHING

BUILDING COMPRESSOR / بناء الضاغط

regular cooking oven
makes a basic part of the compressor when choosing one it is good to pay attention on the fact that there is different standard sizes; biggest size would allow producing bigger objects but also it will consume more electricity; our oven costed us ***15eur*** *2nd hand*

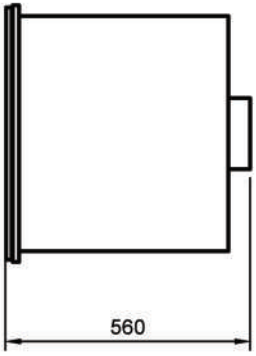
oven is a bit too small and too old!?

we should take this as a challenge and see what we could do with it

but all other ones were out of Belgrade; only transporting it would cost us 3 x more

oven standard big size

SIDE VIEW



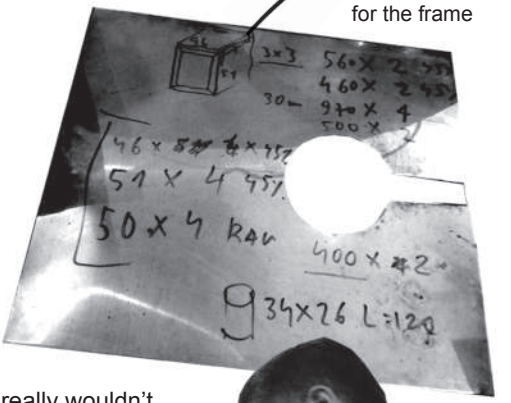
dremel is good for cleaning
(not recomended!!)

dismantling & cleaning oven

تفكيك وتنظيف الفرن

*regarding the **size of the oven***
calculations for the supporting metal structure should be made

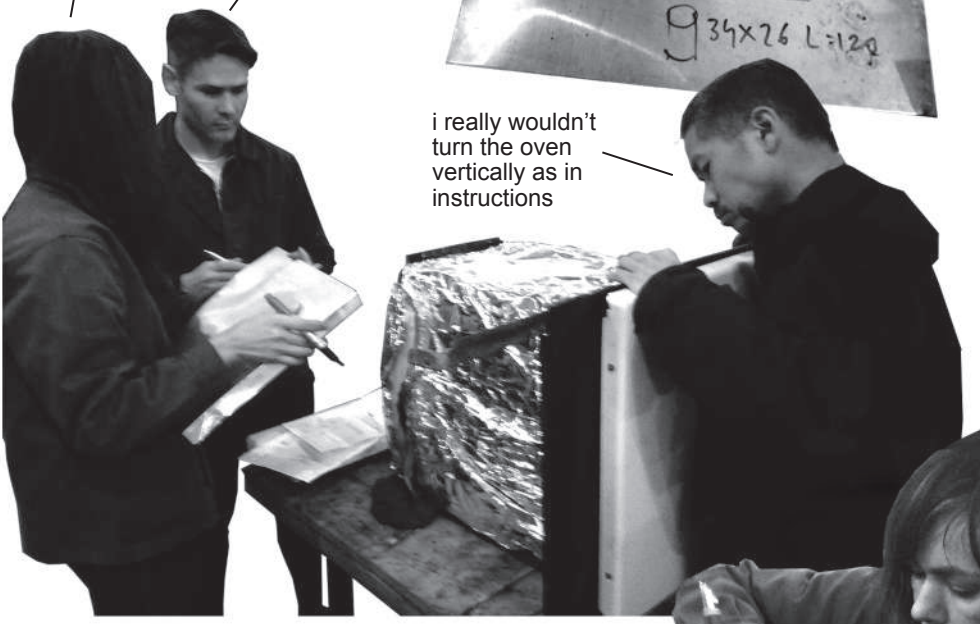
calculating the measurements for the frame

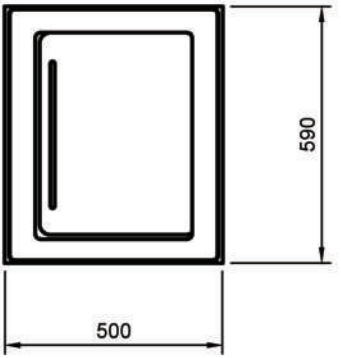


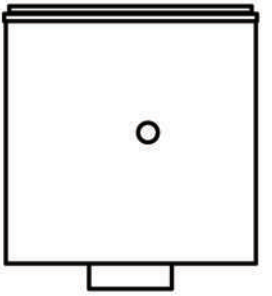
our oven is smaller than a big standard size so we have to calculate dimensions for our structure

please, lets stick to the original plans

i really wouldn't turn the oven vertically as in instructions

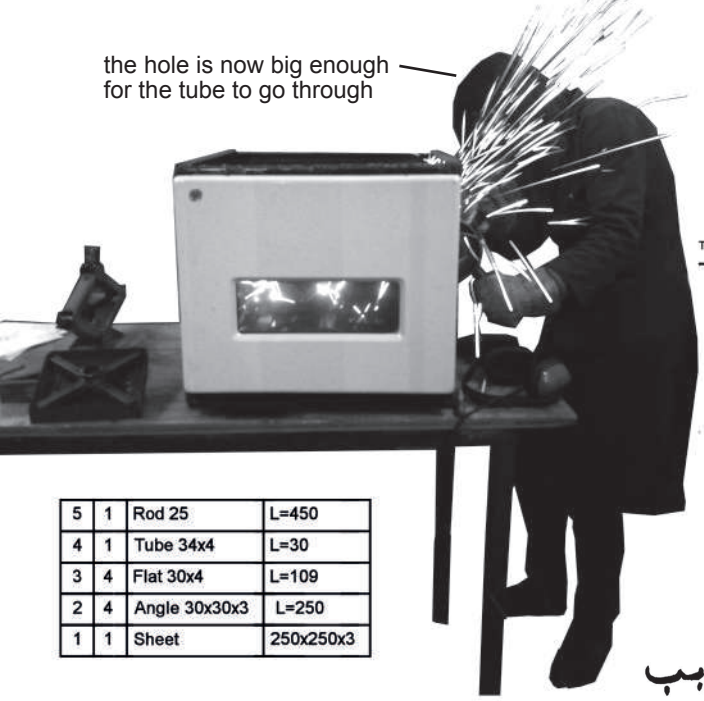


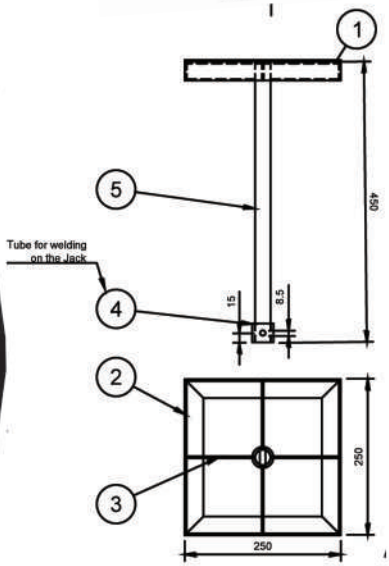




BUILDING COMPRESSOR / بناء الضاغط

the hole is now big enough for the tube to go through





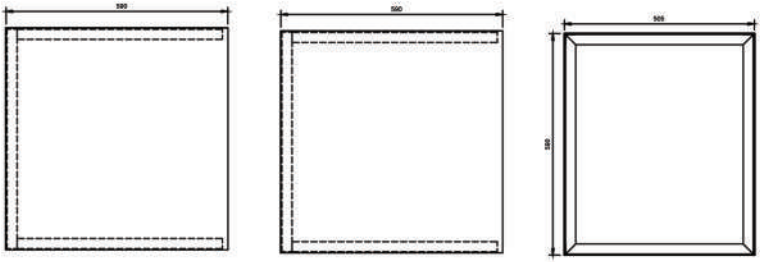
5	1	Rod 25	L=450
4	1	Tube 34x4	L=30
3	4	Flat 30x4	L=109
2	4	Angle 30x30x3	L=250
1	1	Sheet	250x250x3

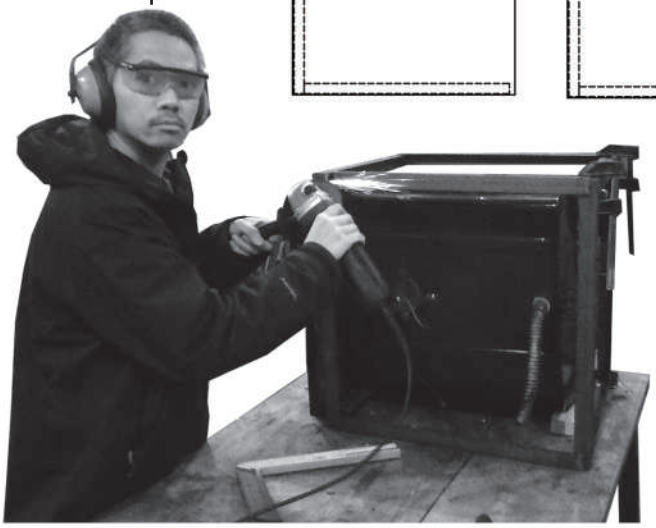
تثقيب

Compression Press

Oven Cover

everything must be polished so the steel panels can fit perfectly on to the frame

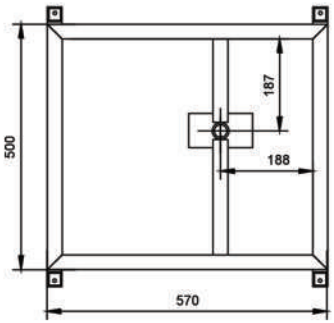




8	4	Angle 30x30x3 (1)	L=545
7	1	Sheet 1mm (2)	505x590x1mm
6	1	Sheet 1mm	505x590x1mm
5	2	Sheet 1mm (1)	590x590x1
4	2	Angle 30x30x3 (2)	L=590
2	2	Angle 30x30x3)	L=505

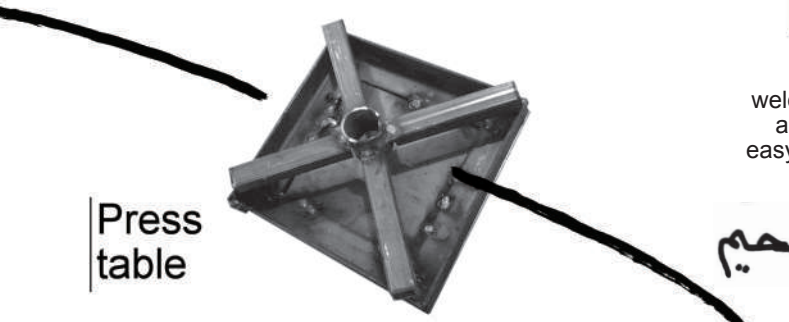
طحن

2_oven & framework



12	4	Tube 30x30x3	L=970mm	Steel
11	2	Tube 30x30x3 (3)	L=570	Steel
10	2	Tube 30x30x3 (2)	L=500	Steel
9	1	Tube 30x30x3 (1)	L=170	Steel
8	1	Tube 30x30x3	L=270	Steel
7	4	Tube 30x30x3 (7)	L=35	Steel
6	1	Sheet 3mm	70x130x3	Steel
5	2	Tube 30x30x3 (5)	L=510	Steel
4	1	Tube 30x30x3 (6)	L=440	Steel
1	1	Tube (1)	34x26 L=120	Steel
Item	Qty	Part Number	Description	Material

Framework

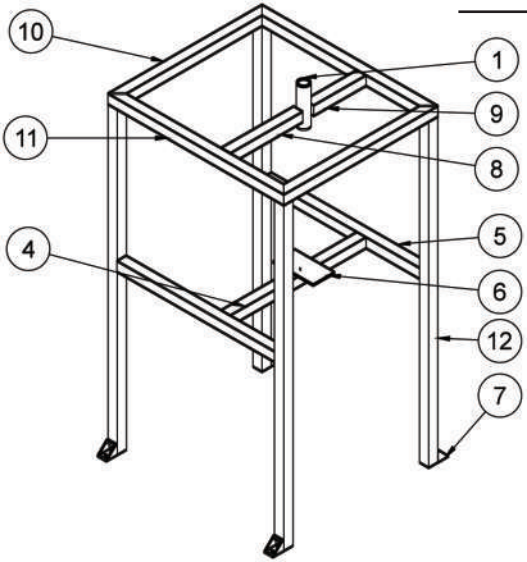


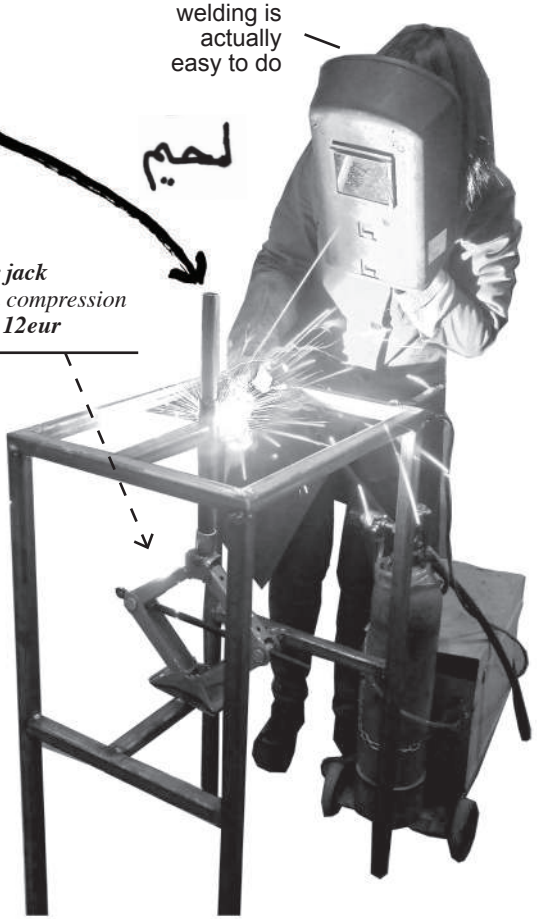
Press table

welding is actually easy to do

لحيم

standard car jack *used as main compression mechanism* ***- 12eur***





BUILDING COMPRESSOR / بناء الضاغط

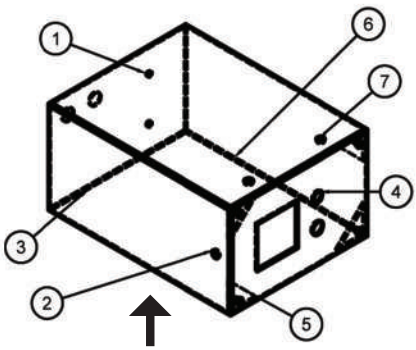
we are replacing the original insulation with new and more efficient materials

compress the insulation well, to close this side!

it is so thick

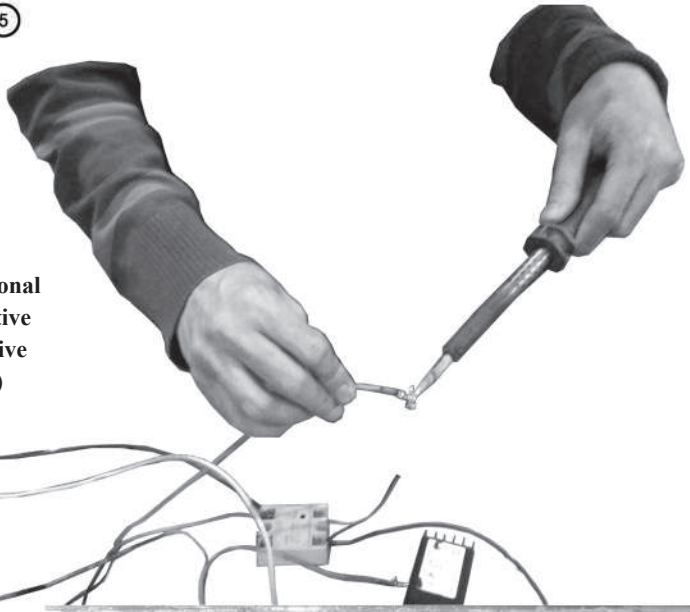
...and don't forget to leave space for the wiring

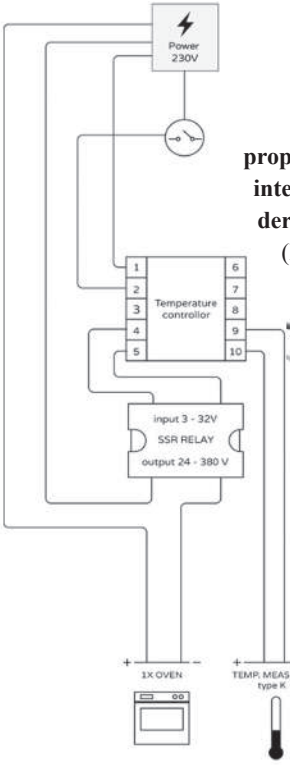
3_insulation & electronics العزل والالكترونيات



Item	Qty	Part Number	Description	Material
7	1	Top	150x200	Steel
6	1	Side	100x200	Steel
5	4	Bracket	Flat 30x3 -45'	Steel
4	1	Cover (1)	150x100	Steel
3	1	Bottom	150x200	Steel
2	1	Side (2)	100x200	Steel
1	1	Rear	150x100	Steel

ELECTRONICS BOX

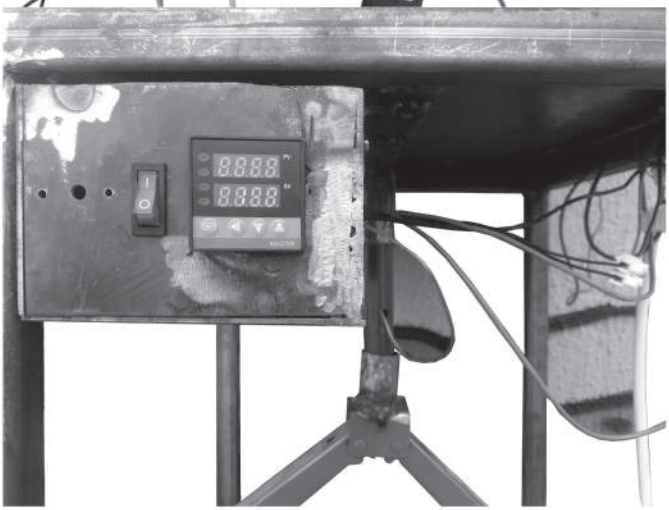




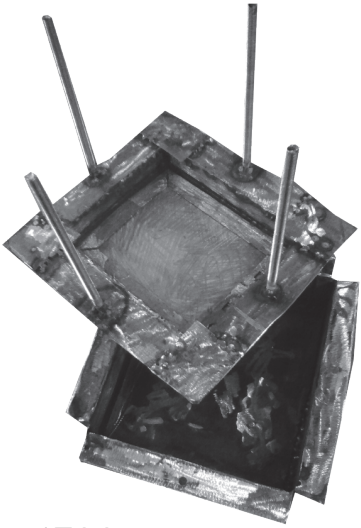
proportional
integrative
derivative
(PID)

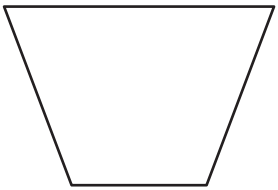
K-type
400º C max

ELECTRIC SCHEME

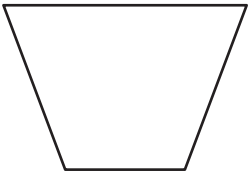


COMPRESSING /





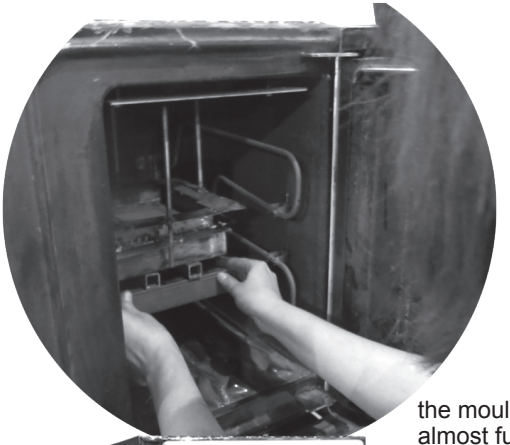
outter side
4x



inner side
4x

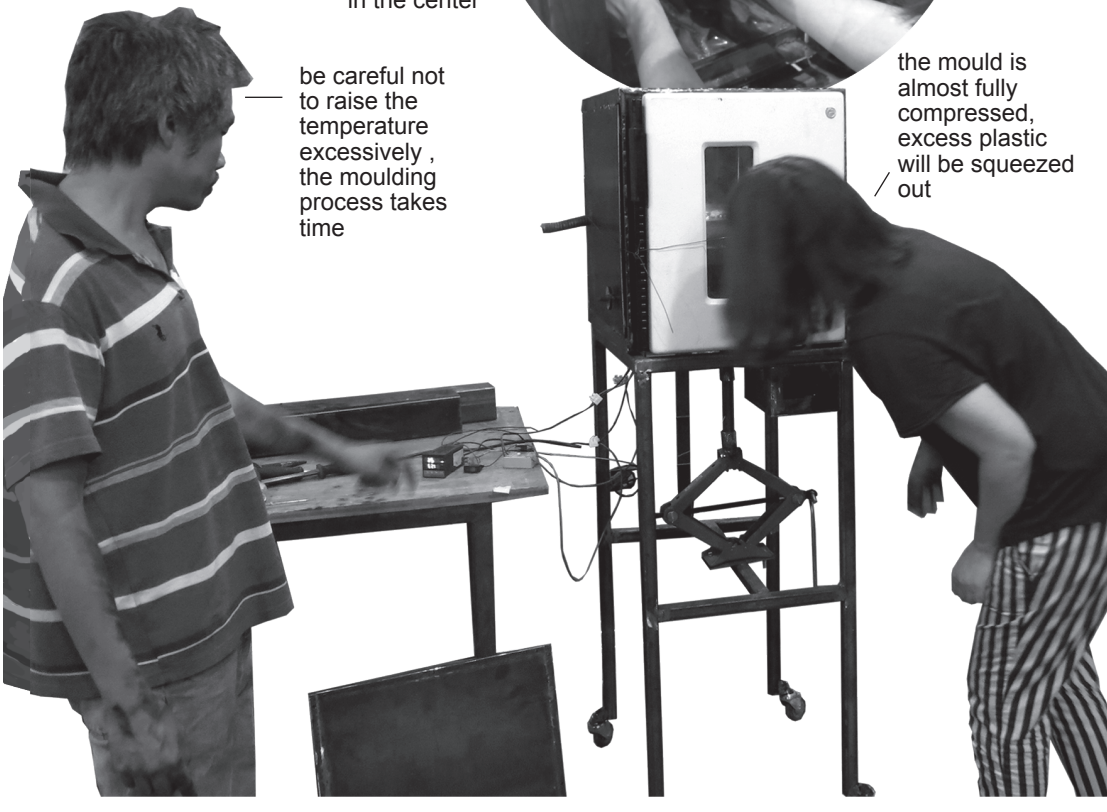
Trial
Mould

it is important to place the mould in the center



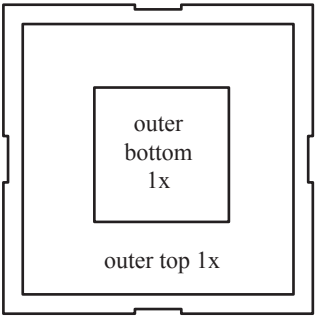
be careful not to raise the temperature excessively , the moulding process takes time

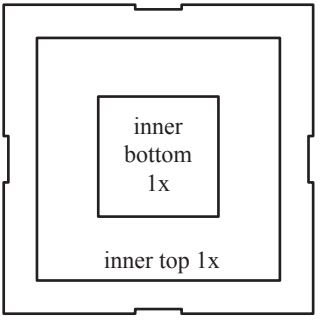
the mould is almost fully compressed, excess plastic will be squeezed out



1_building moulds

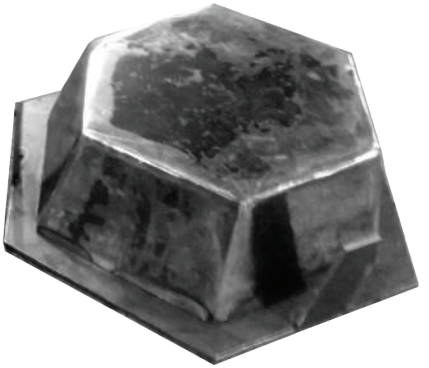
بناء قوالب





sliders
4x

Square Bowl
Mould Plans



the edges of the
moulds should be
joined precisely

HEXAGONAL
BOWL
MOULD

PRODUCTION /

إنتاج

girls, who is going to shred next?

me!

the shredder is working well even with the big plastic parts

what could we make out of this plastic?

cool

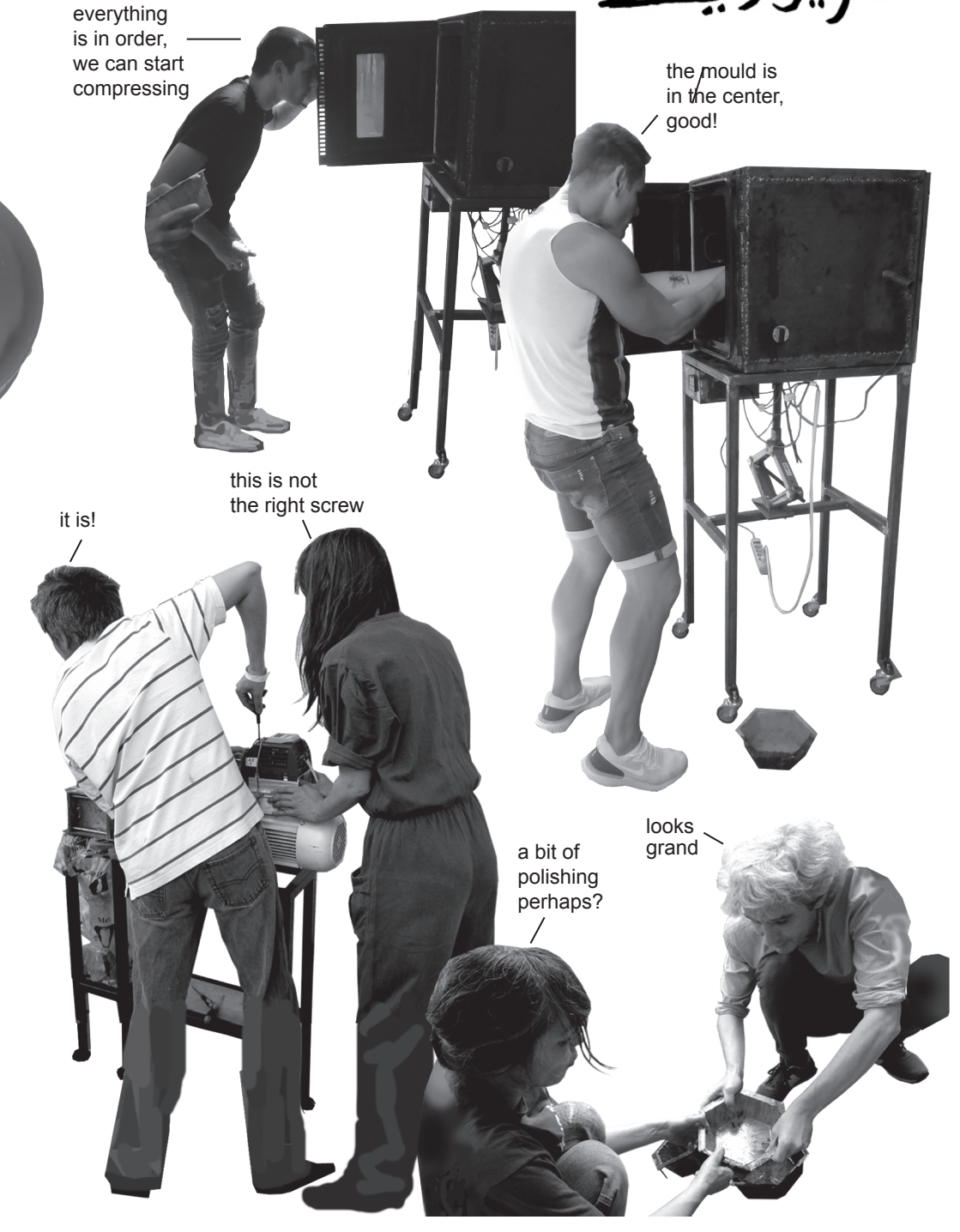
shredding is a violent process, cover the hopper to stop flying pieces of plastic

mobile phone cases?

can I try?

1_shredding & compressing

التمزيق و يضغط

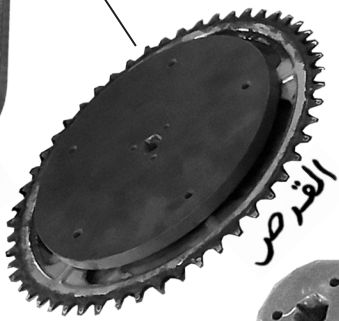


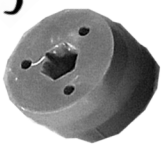
BUILDING EXTRUDER / بناء الطارد

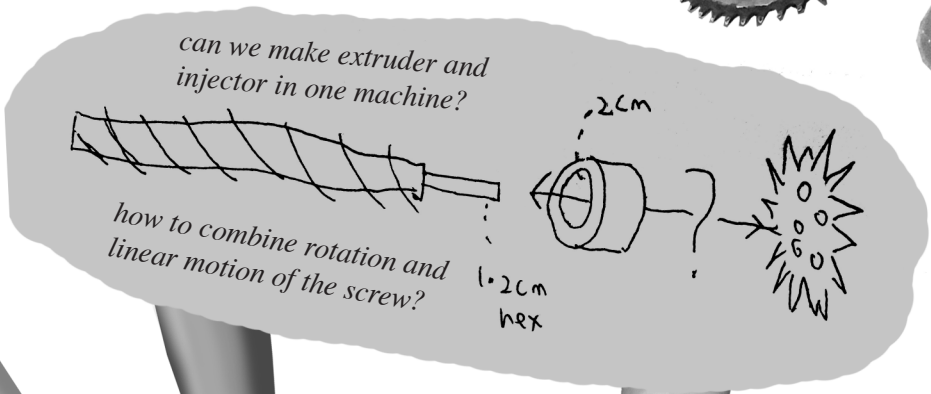
2 bicycle sprockets
one is attached to the motor and another to the screw

bearing
UCFL308

8mm discs
ϕ120mm 1x
ϕ40mm 4x







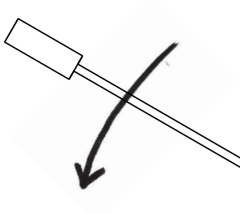
extrusion screw, برغى البثق
ordered from Philipines, 250eur

1_mechanic_elements

الأجزاء الميكانيكية

cutting the hole for the hopper in the pipe

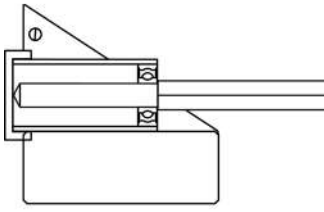
BUILDING EXTRUDER /

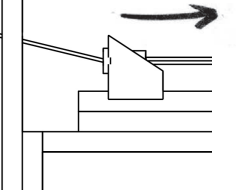


manual pulling force

cantilever converts downwards manual force from the user into horizontal forward motion of the screw for injection action

horizonatal movement



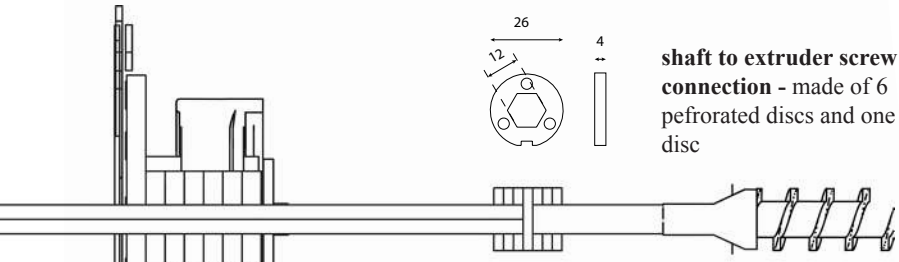


heating electrical systems and electronics are installed after mechanical assembly

the **chain tensioner** is welded on an appropriate location on the frame to provide tension to the chain and keep the chain engaged to the sprockets

electronic temperature controller regulates the output of electricity to the heaters to maintain a constant temperature

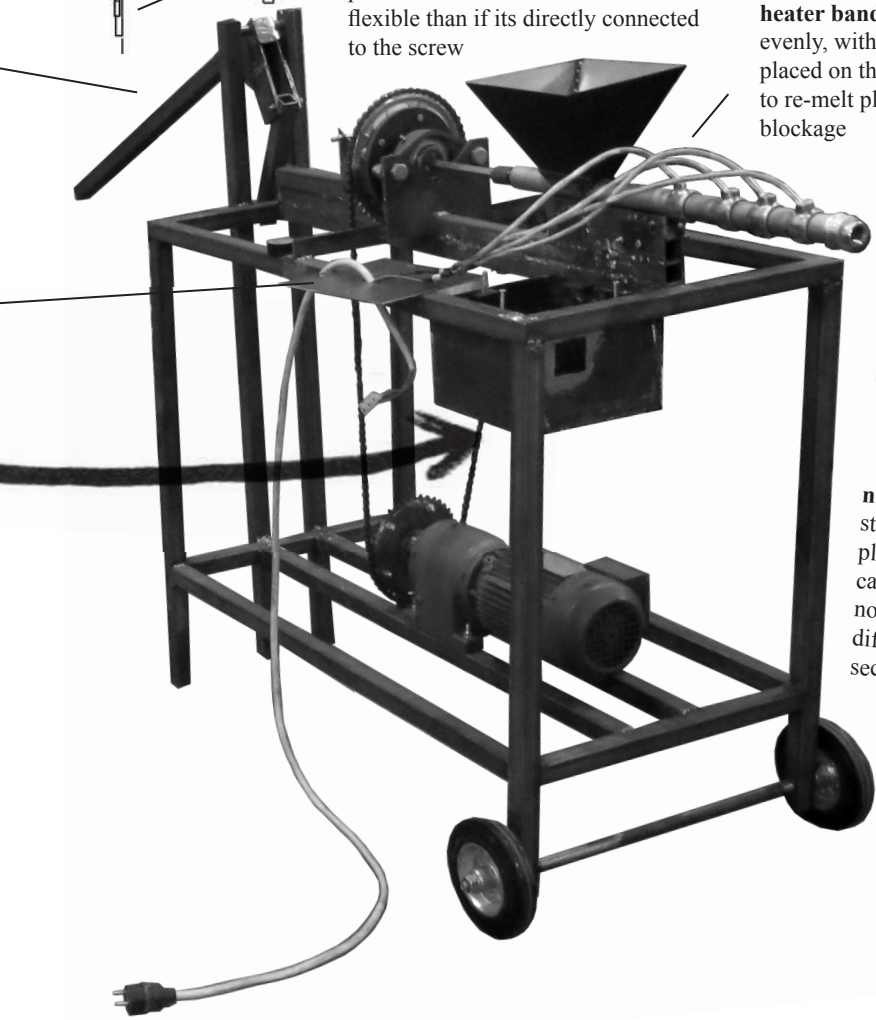
2_heating_elements&electronics



shaft to extruder screw connection - made of 6 pefrorated discs and one blind disc

we use a **bicycle chain drive** to transfer rotational motion from the motor to the screw; in this way position of the motor could be more flexible than if its directly connected to the screw

heater bands should be spaced evenly, with the last heater band placed on the edge of the pipe to re-melt plastic and prevent blockage



nozzle - different standard threaded plumbing connectors can be used as the nozzle to create different output cross sections

PHILOSOPHY / فلسفة

economic self-sustenance is a base for a full integrity and development of every social being. but, in actual capitalist regime of production achieving universal sustenance for everybody is not possible as capitalism is based on competition and extraction of profit - it requires many to be poor for few to be wealthy. having in mind this intrinsic contradiction of capitalism where individual struggle for achieving self-sustenance and providing general equality for everybody are found on the opposite sides, in minipogon we are taking up the challenge of experimenting and putting into practice a new kind of production relations oriented towards both achieving economic self-sustenance and social equality.

from there different questions are raised:

how can we generate equality through the process of collaborative work, given that each of us have different levels of experience in particular areas, different knowledge, and so ways of doing things? and as a consequence has formed different needs and ambitions?

how to organise working process where one's own needs and interests will be satisfied simultaneously to the ones of the wider collective?

how do we value the work that has been performed and what has been produced in this collaborative process, and how do we reassign this value the to individuals and collective? and this values at all could compete on the capitalist market which we depend upon for providing basic self-sustenance for ourselves?

how jointly produced values get distributed so that they transcend the limits of the working collective? could the experience of collaborative work generate a new social environments which would function as a base and support for developing socially and economically more equitable relations?

also, how to deal with the diverse amounts of availability for collaborative tasks, different preferences in types of work and different perspectives on how and what shell be done? we counted over 60 different tasks which have to be performed in order to move our collaborative work forwards: from building and maintaining machines, to accountancy, documenting, editing this manual itself, amongst many others.

those tasks cannot be expected to be performed by a single person, rather the awareness of their totality is cultivated in our group so that there is an understanding and appreciation of everybody's work involved.

we distinguish tasks by their **technical** versus **organizational** natures. technical tasks implies manual and practical skills such as welding, grinding, electric work, but also accountancy, cleaning, etc, while organisational concerning more of intellectual abilities relate to designing, planning, conceptualising, etc. while technical tasks tend to require more patience and could result more boring they actually act as fundamental for organisational tasks - one can't design well a mould without knowing how it could be manually assembled, or one can't make good working plan without knowledge in accounting, etc. urged by efficiency of production and extracting more profit division of labour in capitalism imposes intellectual labour to the manual, so generating hierarchies and class divisions. organisational tasks also tend to accumulate more social agency by performing representation of the work done by others. but, as we know, representation without productive base remains vacant. in the minipogon we, on the contrary try to organise work from the material base giving priority to the practical tasks.

urged to complete common working tasks co-workers are confronting their different visions and ways of doing. through shared experience of this negotiation, so as consecutive failures and successes everybody involved is offered a possibility to acquire new knowledge which multiplies in group becoming a common sense.

in such organisation of work same working process starts to correspond to what is being done - the produced objects display as materialisations of totality of relations that have been involved in their production. even more, once acquired and put in use by the third parties they continue to 'work' as the promoters of the relations which brought them into existence.

also, another question is how to preserve the communal status of collaborative work - what is shared, or communicated through which canals, and where all we could spot privatization and corruption of common values?

how to defend commonness?

WORKING TASKS

وظایف کار

A. planning:
researching opportunities and collaborators
writing proposals, letters, applications
conceiving working plan
tasks overview and general structure and dynamics
discussing the development & orientation
general communications

B. means of production - building:
planning machine building
technical drawings
research & making orders for machine components & services
building (shredder, compressor, extruder-injector, moulds)
welding
grinding
other mechanical procedures
electronics
bank transfers & payments
updating list of materials on website
transporting, driving, organising the transportation
finding free wasted material

C. production:
collecting and transporting plastic
washing
selecting
shredding
compressing
finishing

D. accountancy:
budget planning (excel)
collecting and tidying invoices
communication with the bank and accountant
other administrative tasks

E. public representation & communication:
photo-documentation
video-documentation
website building
creating textual content
creating graphical content / design
uploading material *MP daytoday (image+text)

maintaining social network cannals (Vimeo, FB...)
communication with collaborators & partners
public communication
community radio

F. product development and distribution
product design
product certificate - ‘denomination of origin’
research&contact distribution places
redistribution of created values (monetary and symbolic)
transportation
bank transfers and operations

G. building supportive environment:
maintaining relations with similar organisations and individuals
developing and extending cooperative principles

H. printed material - fliers & posters:
content
design
graphical treatment
distribution

I. educational material / manual:
storyboard
texts
graphical treatment of images
translations
layout
printing
distribution

J. maintenance:
machines
moulds
website
working space
tools

K. misc:
healthy food
good music
good mood

OUR PRODUCTS /

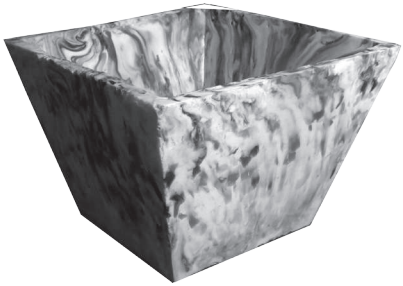
In our studio located in the Krnjača Refugee Camp in the outskirts of Belgrade we developed production of diverse useful objects from the recycled plastic. All products are half manually-half-machine manufactured, so each of them is unique in colours and shape.
By purchasing our products you are also economically supporting camp interns, mostly young refugees from Afghanistan and Pakistan who other ways could not get any economic income, and also supporting efforts we are putting in building more environmentally and socially respectful working relations.

Our products and services you can order via:

- **Precious Plastic Bazar:** bazar.preciousplastic.com/
- **Email / PayPal account:** minipogon@gmail.com
- **FB:** Minipogon
- **Or check for more offers on:** irational.org/minipogon/products

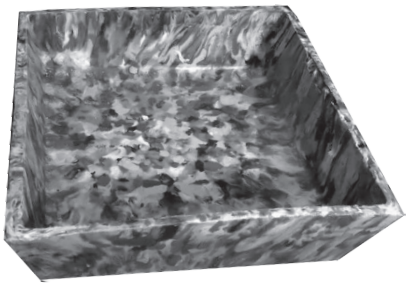
*shipping costs not included

BOWLS & POTS / produced in compression machine / HDPE or PP plastic /



HIGH SQUARE
18x18x15cm
500gr

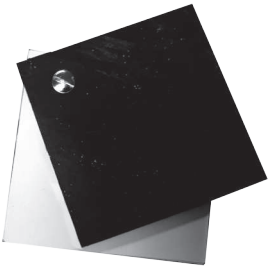
Price:
1x=25eur
3x=60eur



WIDE SQUARE
20x20x5cm
650gr

Price:
1x=25eur
3x=60eur

OFFICE & ACCESSORIES / produced in sheet press / HDPE or PP plastic /



note-books
7x7x1cm
7x9x1cm
~150gr

Price:
1x=4eur
3x=10eur

CLIP-BOARDS
A5 size
B5 size

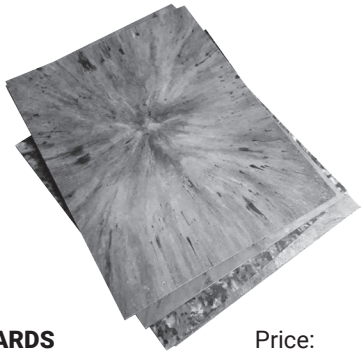
Price:
1x=8-12eur
3x=20-30eur

machines & workshops

Item	price per piece
shredder	850eur
double shredder	1500eur
compressor	650eur
extruder	950eur
injector	700eur

We can conduct workshops in building any of the machines so as general introductory workshops into the process and acessible technologies of plastic recycling. Conditions to be negotiated.

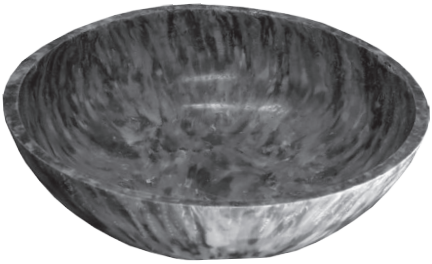
BOARDS / produced in sheet press machine



BOARDS
~23x23cm
thicknes: 2-5mm

Price:
1x=8/15eur
3x=20/35eur

/ products safe for use in alimentation



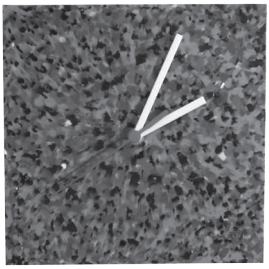
OVAL
20x20x5cm
600gr

Price:
1x=30eur
3x=70eur

HEXAGONAL
20x20x5cm
550gr

Price:
1x=25eur
3x=60eur

/ shipping costs not included, prices depend on weight and destination



WALL WATCH
22x22x5cm
250gr

Price:
1x=25eur
3x=60eur

EARRINGS
diverse colors
and shapes

Price:
piece=4eur
pair=7eur

The idea of **minipogon** (MP) starts to develop in summer 2017 in Belgrade as a small production unit aimed to explore different production relations capable of providing self-substinance and economic equality through self-organised and collaborative work. Deciding to build our infrastructural base on the work of the **Precious Plastic** ( ) Community we are adapting their blueprints for building machines for processing recycled plastic. First machines get fabricated at **Praksa Makerspace** (PRAKSA), at first with our own means, and later with a grant of **Trag Foundation** (trag FONDACIJA), which was sufficient for completing three machines and operating them in weekly open workshops in **Miksalište** (MIKSALIŠTE), refugee day center. In September 2018 MP visits Vienna's Viktor-Adler-Markt setting up the whole production process in the framework of **Wienwoche Festival** (WIENWOCHE www.wienwoche.org), and displays machines in the **Circular Economy Exhibition** (ARA INNOVATION S PACE). From October 2018 our studio is more permanently installed in Krnjača refugee camp in Belgrade outskirts, where our work continues thanks to the **Research&Development Grant** of **European Cultural foundation** ( ) and lots of people who are collecting disused plastics and joining us in the work.

Follow the progress of our work:
www.irational.org/minipogon
Write us or get involved:
minipogon@gmail.com / minipogon@irational.org

Belgrade February 2019