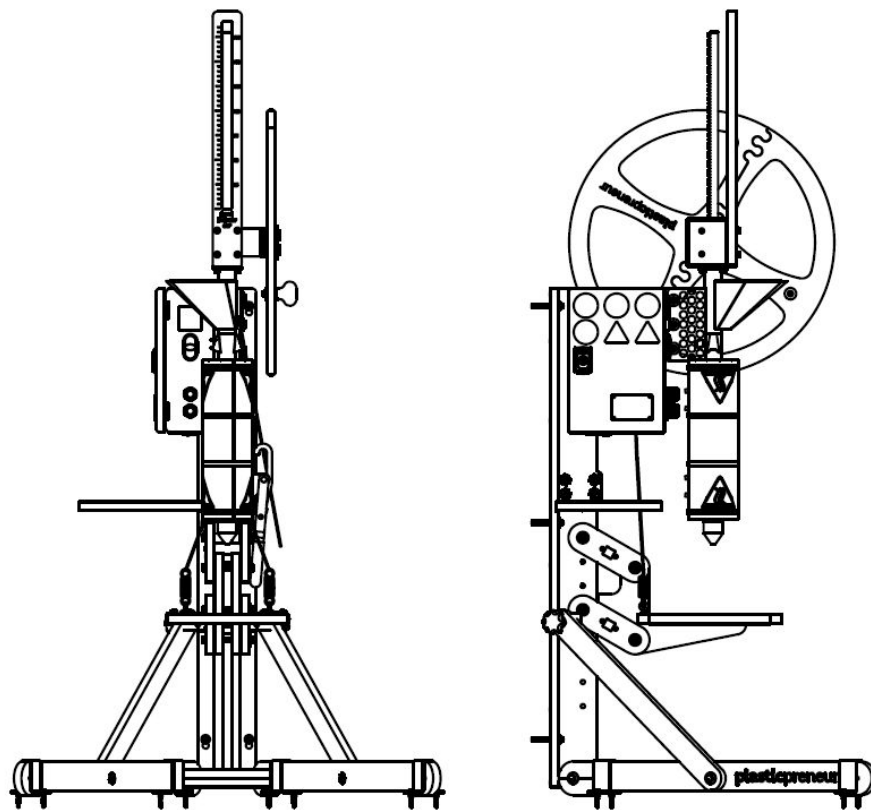


Installation and User Manual

Plastic Injection Machine

IMK1



Dear future plasticpreneur!

We welcome you in our community of changemakers. We are pleased that you have chosen a machine from the plasticpreneur product range.

Plasticpreneur offers you high quality and latest technology. To take full advantage of the device's performance and keep it working for many years, please read this manual before setting up the machine and use the device according to the instructions. The operational safety and the function of the device can only then be sure when both, the general security and Accident prevention regulations of the legislature as well as the safety instructions for operating are observed. We accept no liability for Damage caused by improper use or incorrect operation.



Please make sure that anyone who operates the device has read and understood the operating instructions.

Keep the operating instructions in a safe place in order to access them at any time if necessary.

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1 Description of the product

The plasticpreneur Injection Machine, made out of a wooden frame and arbor press drive, is a ready to use Plastic recycling machine, which allows you to melt plastic, press it into molds and create new products.

The Injection process is human powered, electrical power is only used for the melting process. The arbor press drive makes it possible to exert a continuous pressure regardless the position of the lever. High pressure force with low actuation force allows you to work with this machine by yourself.

2 For your safety

All use and handling of the device requires precise knowledge. Read and understand these operating instructions beforehand. The device is only for the described use. Particularly important comments in this operating manual are highlighted as follows:



This is a warning that indicates risk situations and dangers. Failure to heed this warning can lead to life-threatening situations. It is essential to heed these warnings.



Information!
This is information that is specific to certain observing features.



The device is for a mains voltage of 220-250 V / 50-60 Hz designed. Make sure your device is always correct. Mains voltage is operated. The mains plug must always be closed before maintenance and cleaning work pull.

3 Liability for function and damage

Liability for the function of the device goes in any case to the owner or operator, as far as the device is operated by persons who are not authorized or belong to a specialist company, is improperly maintained, repaired or changed or if handling takes place that is not in accordance with the intended purpose used corresponds. The device must be maintained and operated in accordance with these operating instructions. Doing circular gmbh is not liable for damage caused by failure to observe the above information. Warranty and liability conditions of the sales and delivery conditions of doing circular gmbh are not affected by the above information extended.



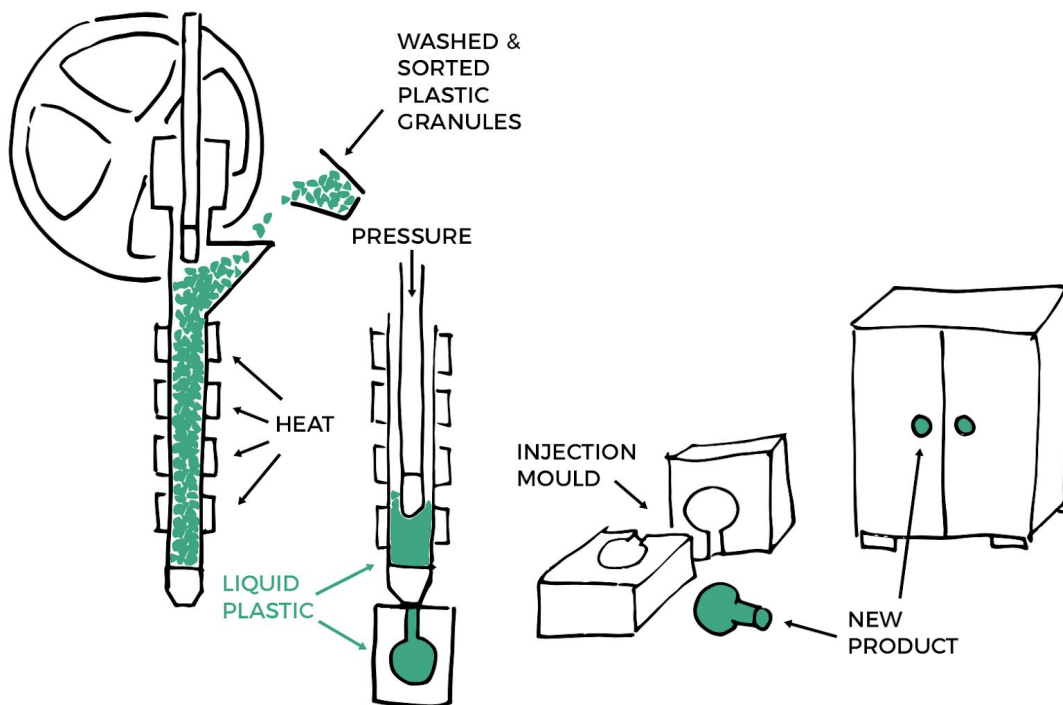
Make sure that the operating instructions are available at all times.

4 Injection Process

The injection machine is the perfect tool to quickly produce products with high precision, in large quantities. Due to its short cycle times it's perfect to scale up production. Every production series from 1 to 10.000 or more, can be easily made with a plasticpreneur injection machine. Once the machine is in place you just have to change moulds and can produce almost anything.

4.1 How does it work?

Shredded plastic enters the injecting barrel through the hopper. Heating elements melt the plastic, making it ready to be injected. With our spring clamp mechanism, the mould is put into place and by turning the wheel, a plunger presses the melted plastic through the injection barrel into the mould. Since the plastic does not get mixed in the injection barrel the output color is often unpredictable when mixing colors. This repeatedly creates unique one-of-a-kind-products and can make you stand out from classic plastic products.



The machine is also exceptionally light and can be easily transported if you are planning to make a demonstration.

4.2 Requirements from your side

Team

To run an effective workspace and make it as easy as possible we recommend to have at least a team of two people to carry out all the necessary tasks.

Workspace

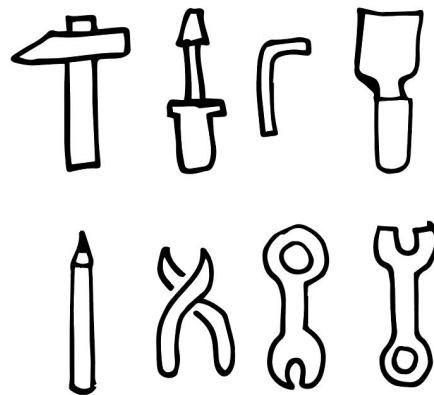
Set up the machines in a well-ventilated and dry room with a solid surface. We advise you to find a space with at least 15-30m² to operate comfortably and safely.

Interior

Make sure you have a stable workbench, a plastic granulator, plastic storage and a mould storage.

4.2.1 Tool set needed

- Hammer
- Screwdriver
- Allen key
- Scraper
- Pickel
- Ring spanner 10
- Ring spanner 13
- Side cutter



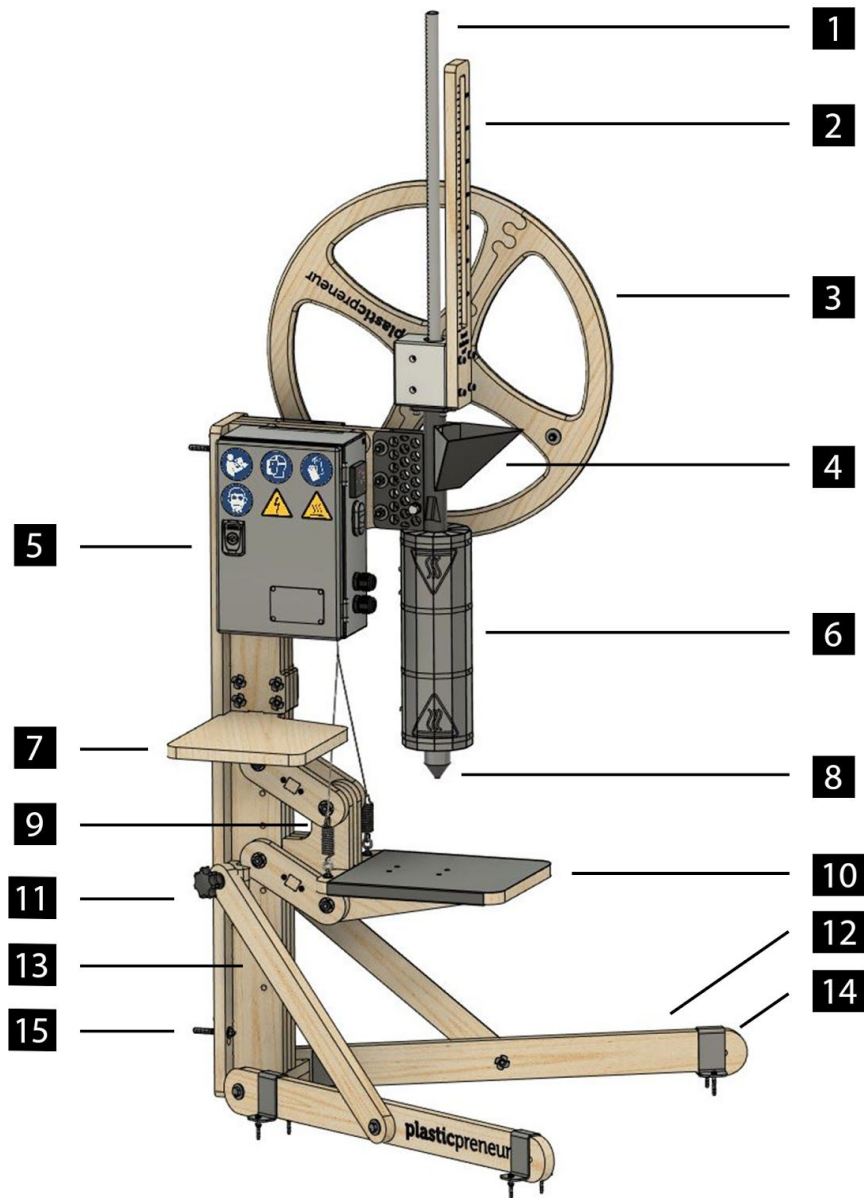
4.2.2 Safety set needed

- Gloves
- carbon-filter-mask
- Faceshield



You can order the tool set and the safety set directly from us.
Just write to products@plasticpreneur.com

5 Machine overview



Designation

1. Plunger	6. Injection barrel	11. Legs mounting
2. Level indicator	7. Side table	12. Bracing legs
3. Handwheel	8. Nozzle	13. Legs
4. Hopper	9. Clamping system	14. Floor mounting
5. Electrical cabinet	10. Molding table	15. Wall mounting

6 Unpack & Assembly



To make assembly as efficient and easy as possible it is best to have another person on hand.

All the tools required are included – you can find them in the small cardboard box.

Step 1: Watch the unboxing and assembly video with plasticpreneur

- Before starting to set up your injection machine watch the Injection machine assembly video on the plasticpreneur YouTube channel to get an idea about the process.



Please note that the video may not reflect all of the current design changes!

Step 2: Take out the whole mounting plate

- All components of the injection machine are mounted on a cardboard plate.
- Get yourself a helping hand and take out the complete mounting plate out of the box.
- Place it on a large table or on the floor.

Step 3: Cut the straps

- To loosen the components from the mounting plate, cut off all the straps that fix the machine on the mounting plate.
- Do not cut the straps which are holding the injection pipe to the machine frame.

Step 4: Give yourself some space

- Remove all parts from the mounting plate and place them on the table to get an overview.
- Place the injection frame with the flat wooden side to the table.

Step 5: Mount the injection barrel [6]

- Remove the cardboard shelves around the injection barrel.
- Open the three screws which secure the injection barrel with a 13 mm ring spanner.
- Lift the injection pipe and bring it in position so that the three holes line up.
- Secure the injection barrel with the three M8x35 screws again – use a washer on each side.

Step 6: Mount the nozzle [8]

- Take off the wooden cover from the lower part at the heatshield.
Hand tighten the metal nozzle on the thread.

Step 7: Mount the legs [12] & [13]

- Take one of the bracing Legs [12] and place them on one of the bigger wooden pieces [13]
- Assemble the two pieces with one M8x40 screw and a washer.
- Repeat the process with the other two wooden parts.
- Mount the assembled legs on the lower end of the wooden frame with a M8x40 screw and a washer.
- Turn the smaller wooden piece up and mount it with a handle screw [11].
- Repeat the process with the legs on the other side.

Step 8: Turn up the machine

- Lift the machine from the table and place it onto its legs.

Step 9: Mount the handwheel [3]

- Take the handwheel and place it onto the rack drive shaft.
- Make sure the holes of the spinning wheel line up with the threads in the rack drive.
- Secure the handwheel with the big washer and tighten it up with six M6x30 screws – use a washer on each screw.

Step 10: Mount the knob on the handwheel

- Take the knob and the screw out of the paper bag. Unscrew the nut from the screw.
- Screw the knob into the nut provided on the handwheel from the right side, until it is flat on the surface.
- Secure everything with the nut on the other side of the handwheel.

Step 11: Mount the level indicator [2]

- Take the wooden level indicator and mount it with four M6x30 screws on the rack drive.
- Don't forget to use washers ;-)

Step 12: Mount the side table [7]

- Take the side table and slide it into the opening in the middle of the frame from the left side.

- This will give you extra space to place your tools and moulds during the work process.

Step 13: Mount the injection machine [14] / [15]

- Find the best place for the machine in your workspace.
- To make it super stable you can mount the injection machine to the wall or on the ground.
- **Wall mounting:** use 6 x 60 mm hanger bolt and dowels to secure the machine on the six mounting holes on the wall.
- **Floor mounting:** use the mounting plates to screw the machine to a wooden plate or to the floor. When screwing it to a wooden plate we recommend using 5 x 35 mm wood screws.

Step 14: Plug in the power cord

- Take the power cord and plug it in the opening on the bottom of the electrical cabinet.

Step 15: Turn on the machine

- You can find the main power switch on the bottom of the electrical cabinet right next to the power cord.
- After flipping this switch you can start the machine by pressing the green operation switch on the front of the electrical cabinet.

Nice – you made it!

You will learn how to operate the machine in the following chapter.

7 Different types of plastic

There are all kinds of different types of plastic out there.



We designed our machines to work with HDPE, PP and PS. They are quite common, easy to recycle and safe to use.



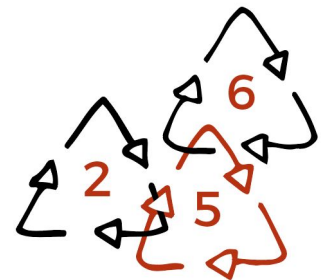
Different plastic types should never be mixed as this will drastically decrease their quality and make it very difficult to recycle them in the future. Moreover, when different types of plastics are melted together, they tend to phase-separate, like oil and water, and set in layers resulting in structural weakness and lower quality products.



DON`T MIX DIFFERENT PLASTIC MATERIALS!



We do not recommend using recycled plastic to make food safe products!



7.1 HDPE (2): High-density polyethylene

HDPE is often used for food and drink containers, as well as milk bottles, motor oil, shampoo bottles, soap bottles, detergents, bleaches, toys and bottle caps. Products of this plastic type are often easy to collect, sorted and clean. HDPE works very well with plasticpreneur machines and is great to start with!

Working Temperature: 200-240°C

7.2 PP (5): Polypropylene

PP is one of the most commonly available plastics on the market, it is strong and can usually withstand higher temperatures. PP has a wide variety of uses but is consistently used for products that get in contact with food and drink – tupperware, yoghurt boxes, syrup bottles etc. PP works very well with plasticpreneur machines.

Working Temperature: 220-250°C

7.3 PS (6): Polystyrene

PS is most commonly known as Styrofoam, but also appears in many more products. PS can be recycled, but not efficiently – recycling it takes a lot of energy which means that few places accept it. Disposable coffee cups, plastic food boxes, plastic cutlery and packing foam are made from PS – it works very well with plasticpreneur machines.

It is one of the more toxic plastic types (so special attention please!), but at the same time offers great aesthetic and haptic properties as it is comparable with glass and can be polished.

Properties: clear, glossy, hard, stiff

Working Temperature: 220-250°C






7.4 Dangers of heating plastic

When heating plastic, toxic gases may arise. Depending on the type of plastic that is being processed and the time the plastic is in the machine, they may be carcinogenic gases. To be safe, try to avoid inhaling any plastic fumes, wear a carbon-mask and always make sure there is good ventilation in your workshop.



We recommend installing a carbon filter suction system on the nozzle and hopper.

8 Operating safety regulations

	operation only by trained employees		use carbon-filter-mask
	wear a face shield		wear gloves
	hot surface		

8.1 The machine can be used with the following materials

Material	Working temperature
HDPE	200-240°C
LDPE	200-240°C
PP	220-250°C
PS	220-250°C
PLA	200-230°C
ABS	230-260°C
TPU	210-250°C



Never use fluor plastics such as PTFE, as they release dangerous substances such as hydrofluoric acid and can irreparably damage the machine!

It is extremely dangerous to work with Nylon (PA). Due to its chemical properties, Nylon (PA) absorbs water molecules from the air. This can lead to deflagration!

9 Instruction manual

9.1 When starting the machine, the first time

- Wear protective equipment
- Check the machine before each start-up.
- Turn on the machine and set up the working temperature by pressing the arrow on the display. You can change the decimal place by pressing the arrow to the left.
- Wait until it reaches the temperature – this takes around 10 minutes.

9.2 Granules size



For a good workflow we recommend using medium size flakes or industrial granules. Bigger flakes may not fit into the injection machine and cause damage on the machine!

9.3 When the machine has reached working temperature

- Bring the plunger [1] to the upper position by turning the handwheel [3].
- Fill in some plastic flakes in the hopper [4].



Make sure the plastic flakes are washed, dry and free of metal parts!

- Make sure the plastic gets into the injection barrel [6].
- Compress the plastic in the pipe by turning the plunger down.
- Let the plastic melt for 7-10 minutes (set yourself a timer).
- You can clamp a piece of wood between the nozzle [8] and the clamping table [10] to prevent the plastic from running out of the barrel.
- While the machine melts the plastic, set up the moulds.
- You can place the moulds on the side table [7].
- When the plastic is melted, remove leaking plastic from the nozzle and put the mold in position on the table.
- Set the spring clamp system [9] to the hole you need for the mould.
- Clamp the mould, with the spring clamp system between nozzle [8] and table [10].



You can increase the clamping pressure by adding a piece of wood between the mould and the spring clamping table [10].

- Turn the handwheel [3] fast and apply pressure until some plastic is pushed out from the top of the mould.
- Unclamp the mold by releasing the handle of the spring clamp system.

- Turn the wheel to bring the plunger to the upper position.
- Fill the injection barrel with new material.
- Compress the plastic in the pipe by turning the plunger.
- While the plastic melts, carry out the de-moulding process.
- When the plastic is melted, repeat the process.

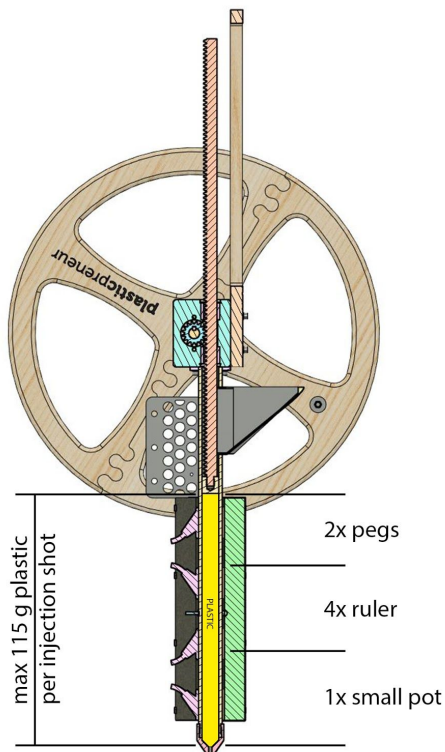
9.4 When you are done injecting

- Press the remaining plastic out of the injection barrel.
You can shred it again with the plasticpreneur granulator.
- Turn off the machine and let it cool down

10 Tipps and Tricks / better Workflow

10.1 Combine the right moulds

Since there is some air in between the flakes, you get a maximum volume of max. 115 g of plastic per complete injection barrel. Depending on the plastic type and flake size it can be a bit more or less.



This is also the maximum volume of one part you can make with the injection machine.

Measure the weight of each product and then combine them:

For example, you can make

- 2 x pegs = 25 g
- 4 x ruler = 55 g
- 1 x small pot = 35 g
(=115g in total)

with one full barrel.

To make sure you are not losing any plastic you can clamp a piece of wood below the nozzle to prevent it from leaking.

10.2 Get into your Workflow

As described in the previous chapter, the plastic needs 7-10 minutes to be liquid.

- Fill up the machine completely
- Set yourself a 7,5 minutes timer to be efficient as possible
- As soon as the timer rings start injecting into the moulds
- When finished injecting fill up the machine completely
- Start the timer again
- Use the 7,5 minutes to open and close the moulds
- Repeat the process

With this technique you can make 6-7 full shots per hour.

This would be 42-49 products per hour with the mould sample from above. To be more efficient you can work with two injection machines parallel and always inject with one, while the other is melting the plastic. With this you can double your productivity to 12-15 shots per hour.

11 Error and Problems

11.1 Clogged nozzle

1. Wait until the machine is heated up completely.
2. You can try to unclog the nozzle by inserting a suitable sized punch or a drill bit in the nozzle opening.
3. If it still does not work, you can unmount the nozzle with a pipe wrench.
4. Clean it manually with an ice pick.
5. Press some plastic out without the nozzle mounted.
6. Clean it again manually and mount the nozzle.

11.2 Electrical problem – machines doesn't work any more

1. Check the fuse in your workshop.
2. If your Workshop fuse is OK the machines fuse is broken

How to change the machine fuse:

1. Have a look at the black plug socket for the cable with the main switch, located on the underside of the control cabinet. The fuse is located in the middle of this socket.
2. The fuse holder can be easily loosened with a slotted screwdriver.
3. There should be a replacement fuse in the opening.
4. Reassemble them and the machine should be ready for use again.
5. If you need some spare fuse you should get them at you local hardware store – they are called:
Slow Impact Glass Fuse – T10AL250V – 5 x 20 mm 10A 250V

11.3 Heating elements problem

1. During transport of the machine it can happen that one of the heating elements cable breaks off.
2. You can tell when the machine is no longer heating properly.
3. Should this occur to you, please contact us.

11.4 Electrical problem

1. Reboot the machine.
2. If the problem is still there, you can reset the components and autotune them.
3. You will find the instruction under:
<https://pmod79883-pic31.websiteonline.cn/upload/szm4.pdf>

11.5 Heavy temperature fluctuation

1. Autotune of the temperature controller.
2. Remove material completely.
3. Set temperature to 200 degrees, hold down the set key.
4. Press the short set key, switch through until Ctrl appears on the display.
5. Switch with the arrow keys 3 to 2.
6. Go through the menu with the short set key pressure until the actual value display flashes the actual value, the process is finished when the display stops flashing.
7. This can take up to 1/2 hour.

11.6 Loosen up from parts

Tighten the screws again.



If there is any other problem feel free to get in touch with us. Send us pictures via mail to products@plasticpreneur.com

12 Cleaning process

1. At the end of each working day, press the remaining plastic out of the nozzle.
2. Clean the machine with compressed air or a brush from plastic particles.
3. When you change material, make sure that the remaining plastic is out of the nozzle.



You can unscrew the nozzle between color changing, to get clean results.

4. Since the machines are made of plywood, avoid cleaning with water.
5. Keep the machine clean, to avoid a fire through overheated material.

13 Maintenance

The device is extremely easy to maintain and requires no special maintenance during normal operation. Just make sure that the device is clean. Depending on the frequency of use, signs of wear and tear will show and parts may need to be changed after some time. Check the screw connections once a month. If something is loose, tighten the screws again.

- From time to time, spray the rack with graphite spray or BN spray (boron nitride), move and wipe off any excess oil.
- To prevent rust, wipe all metal components regularly with a little oil.
- If excess material is firmly seated above the injection plunger, this can be removed with a flat screwdriver. In the case of heavy soiling, the entire press drive can be unscrewed from the 4 screws, removed upwards, cleaned, lightly oiled and used again.

14 Warranty

The warranty period for our devices is 24 months. If a defect occurs within this guarantee period contact our service staff directly. The injection machine may only be operated in technically perfect conditions. If defects occur that could endanger employees or third parties, the device may only be used again after it has been repaired. Damages caused by improper use, external mechanical influences, during transport or by unauthorized persons are not covered by this guarantee.

15 Repairs

Service or repairs to the device may only be carried out by trained specialist personnel. In replacement are only original parts to use. Product liability expires if the device is changed by unauthorized persons and by installing non-original parts.

16 Technical data

Injection Machine	IMK1
Injector	manual
Shot volume	max. 115 g
Injection pressure	max. 70 bar
Heating power	880 W
Heating zones	1
Max operating temperature	300°C
Power input	200-250 V
Frequency	50-60 Hz
Total power	880 W
Dimensions	90 x 70 x 175 cm
Weight	28 kg
Shipping dimensions	120 x 60 x 30 cm
Shipping weight	32 kg
Nozzle thread	Male G1"
Mold connection	Spring clamp system

Technical changes reserved!

17 Declaration of Conformity

Product

Hand driven plastic injector

Type.-Nr.: IMK1

Year of manufacture: 2021

The undersigned hereby declares that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

Low Voltage Directive 2014/35/E, EMC-Directive 2014/30/EU

Harmonized standards referred to, in particular:

- *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (ÖVE/ÖNORM EN 60204-1)*
- *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

We further declare that all relevant technical documents for above-referenced devices are created according annex VII part A of low voltage and we are committed to supply the technical documentary on demand to the authorities responsible for market supervision. A Manual has been delivered to the customer.

This declaration shall lose its validity if the device is modified without consulting us.

plasticpreneur by doing circular gmbh

Klagenfurt, 03/2021

Florian Mikl, CEO



18 Notes

We empower people and clean up nature through
plastic recycling and entrepreneurial skills.

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