

# Kühling&Kühling RepRap Industrial 3D Printer (Prototype)

Kühling&Kühling RepRap Industrial

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**Durable ABS prints without warping.**  
**Heated build chamber.**  
**Dual extruder printhead.**  
**Super easy maintenance workflow.**

This is our RepRap-based desktop 3D printer that can reliably print objects from **ABS plastic without warping** - a problem well known from many desktop-grade 3D printers and RepRap designs.

The “Kühling&Kühling RepRap Industrial” has a fully enclosed frame with powerful recirculating **chamber heaters** that raise the ambient air temperature up to 70°C. With minimized thermal stress the printed objects adhere flat to the build platform and allow for dimensionally accurate results.

Featuring **two extruders** this 3D printer can print with different nozzle diameters - printing the visible outer shell of an object in fine details while saving production time on the infill structure by using a bigger extrusion nozzle. Or you can do pretty two-color prints from equal tips.

The whole machine was **developed for productivity**, so you can expect minimal maintenance time for several recurring tasks like swapping filament, changing nozzle tips or levelling the build base. All sub-assemblies are easily accessible so you get the job done quickly.

Front view Front view Front view - doors open Front view - doors open Side view Side view HxWxL: 80x55x55 cm HxWxL: 80x55x55 cm Top view Top view

Doors open Doors open Spool holders on the back - plus cable mania.. Spool holders on the back - plus cable mania.. Back view - cable harness waiting for new high power MOSFET driver boards to be finally wired up Back view - cable harness waiting for new high power MOSFET driver boards to be finally wired up Front view Front view One of four circulating air heatings - each providing 120W for 70°C chamber temperature One of four circulating air heatings - each providing 120W for 70°C chamber temperature

Active carbon air filter Active carbon air filter FR4 print surface FR4 print surface Print bed, bottom view - semi-automatic 3 point bed leveling system Print bed, bottom view - semi-automatic 3 point bed leveling system Dual extruders, front view - water cooled hotend insulators Dual extruders, front view - water cooled hotend insulators Dual extruders, back view - water cooled planetary geared stepper motors Dual extruders, back view - water cooled planetary geared stepper motors

Advanced custom cnc'd direct drive extruder gears Advanced custom cnc'd direct drive extruder gears Front left Y end with belt idler Front left Y end with belt idler Left X end with stepper motor and hall-o endstop Left X end with stepper motor and hall-o endstop Y stepper motor Y stepper motor Z stepper motor with Sugru spider coupling Z stepper motor with Sugru spider coupling

## Specifications

- Filament diameter: 3mm

- Build volume: 200mm x 200mm x 200mm
- Number of extruders: 2
- Overall dimensions: 800mm x 600mm x 600mm

## Features

- Specifically aimed at printing ABS with zero warping, low maintenance effort through highly accessible sub assemblies
- Rigid frame made of t-slot aluminium extrusion
- Fully enclosed by acrylic and wood, doors on the front
- A heated chamber capable of 65-70°C recirculating air temperature
- Heated PCB print bed
- Water cooled hot-ends and extruder steppers to ensure reliable extrusion in high ambient air temperature
- Fully parametric Open Source design
- Dual extruders, primarily for use with different nozzle diameters for perimeters/infill to save printing time on big objects
- Activated-carbon air filter to remove unpleasant smell of molten plastic
- Semi-automatic print bed levelling makes calibrating the machine a matter of seconds
- Z-leadscrew bearing supported on both ends, sugru spider coupling for absolutely wobble-free operation
- 12 mm precision ground shafts with LM12UU linear ball bearings on all axes (will be replaced by Icus RJMP, see below)
- Tool-free belt tensioning with built-in thumbwheels
- Direct-drive extruders with high torque geared stepper motors
- Permanent printbed material (polyetherimide (PEI) glass fabric composite) – no Kapton or PET tape needed
- Adjustable nozzle height to align both extruders on the same level
- Custom designed, precision extruder drive gears to provide enough grip on the filament in a heated environment
- Integrated LED lighting
- All-metal hot ends from rewrap-fab.org with 40W each for short heat up time
- Raspberry Pi with a 10" capacitive touch display for ethernet enabled standalone operation
- Touch optimized user interface for the raspberry pi is in development
- Magnetic door locks

## Upcoming development

- 400mm x 400mm x 400mm super-sized printer based on our extremely parametric design

## Open Source

The development version of our OpenSCAD source files are available on GitHub at <https://github.com/kuehlingkuehling/RepRap-Industrial-200>. A Bill of Material as well as build instructions and details on electronics and wiring will be published as we lock down v1.0 and sales start.