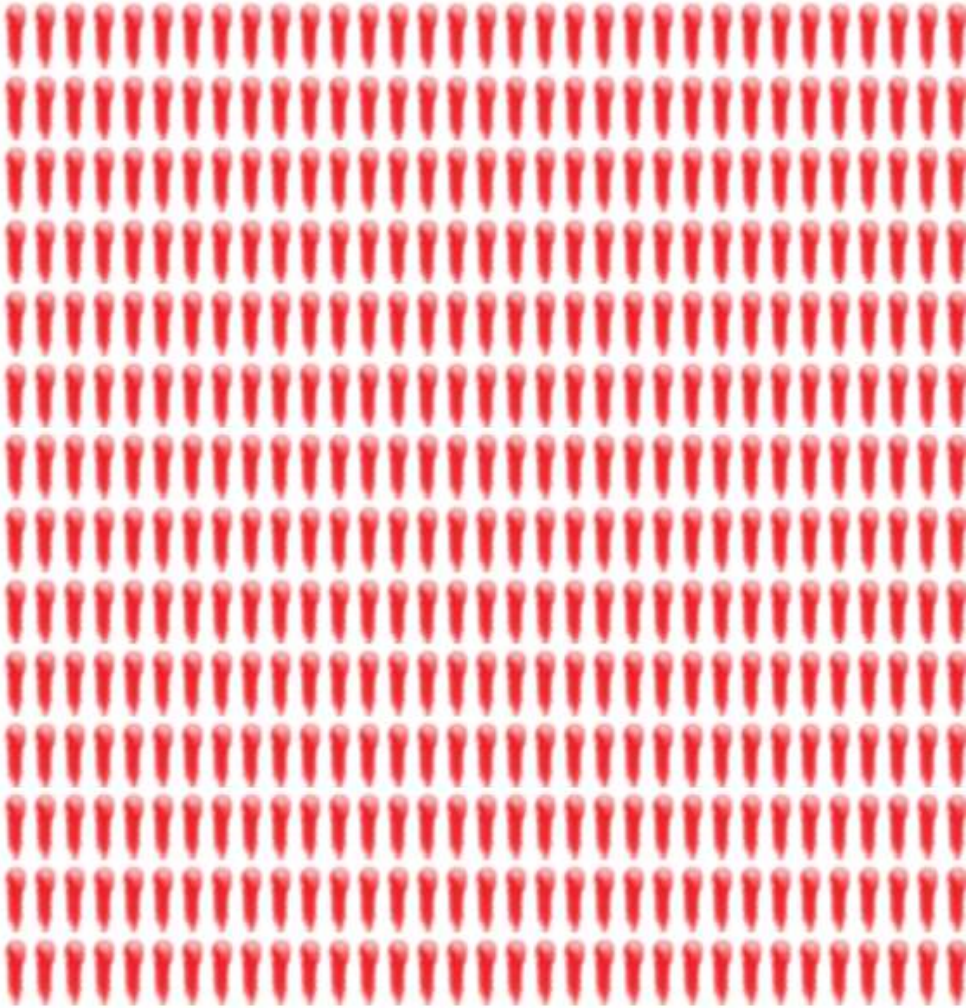
ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com



Hardware System for the production of

Artificial Thrombi

The Task:

To reproduce a large number of identical thrombi in a process-safe manner.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

Hardware System for the production of

Artificial Thrombi

Preparation

without time-critical moments

Any number of tube rings can be prepared at any time.

The process steps are simple, reproducible and can be interrupted as required.

The tubing material is here for example:

PVC tubing with 3 mm ID / 5 mm AD
The ring diameter is ø 100 mm

Other dimensions are possible.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

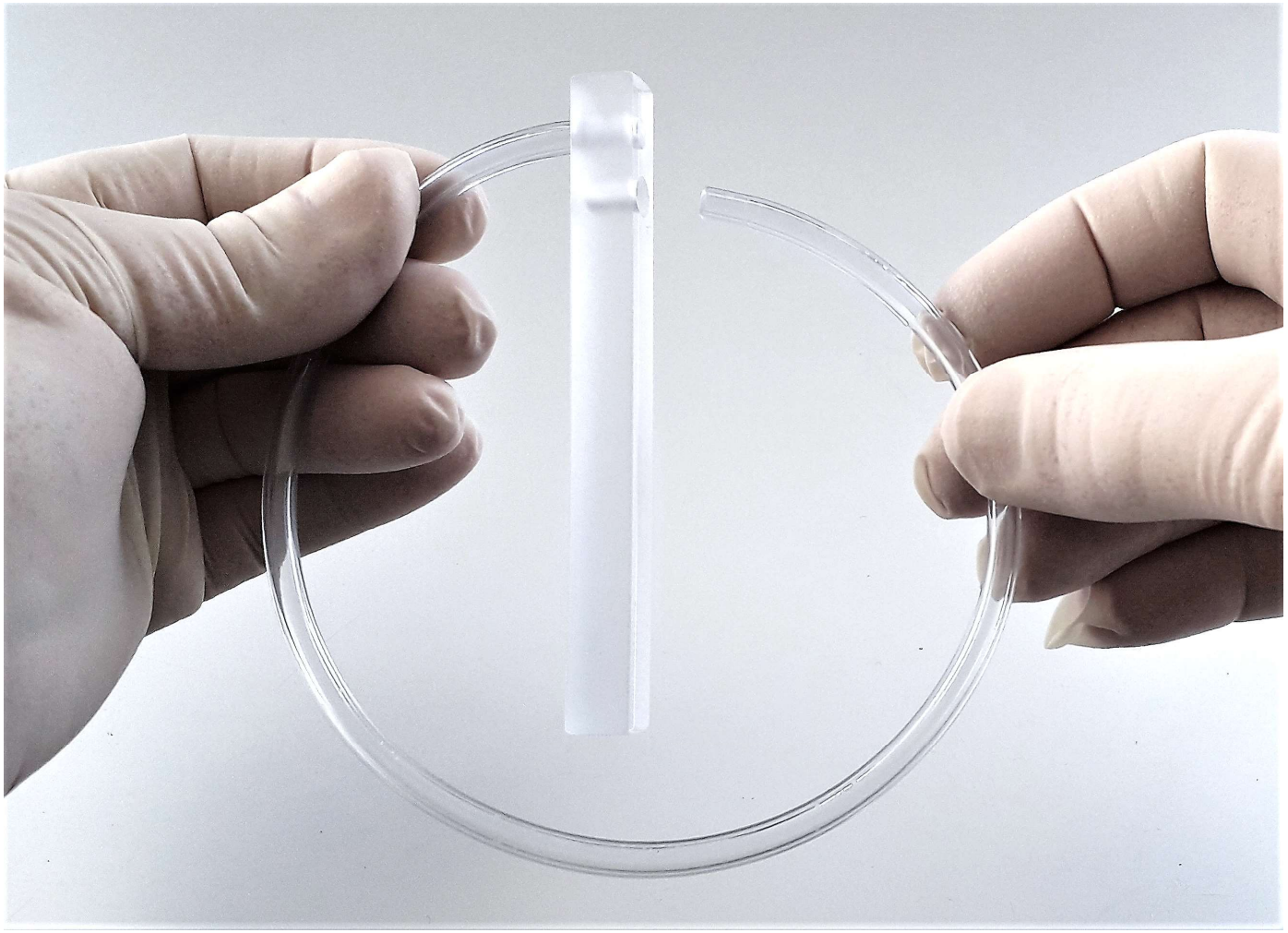
Hardware System for the production of

Artificial Thrombi

The PVC tubing is cut to a precise length.

The cut surface is perfectly flat
and perpendicular to the contour

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

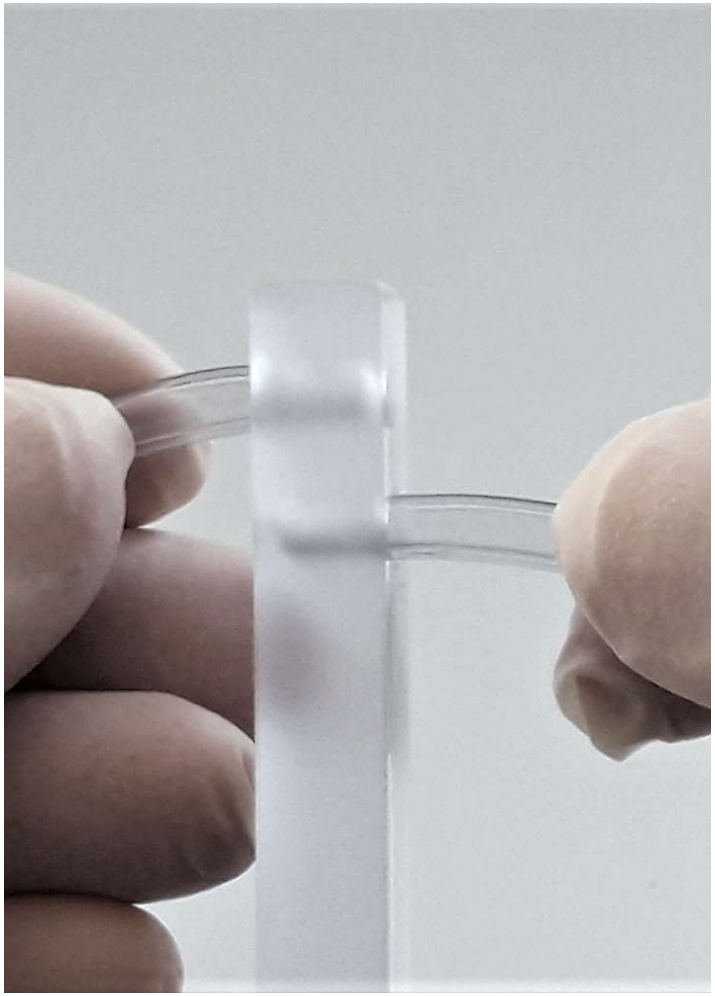


Hardware System for the production of

Artificial Thrombi

The tube ends are inserted into calibrated blind holes.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com



Hardware System for the production of

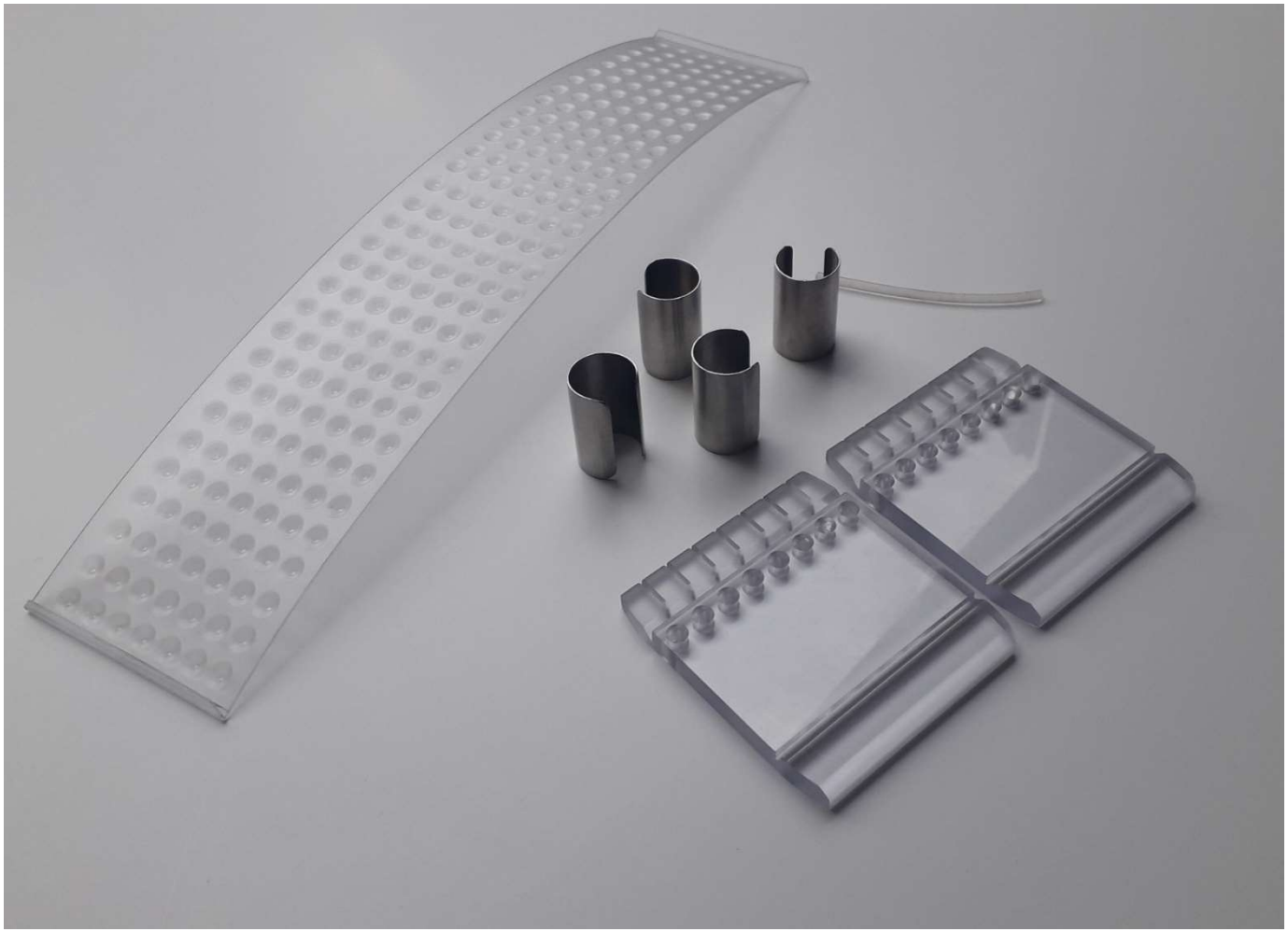
Artificial Thrombi

1
This protects the tube section inside
from contamination

2
The tubings ends are compressed and calibrated
to the nominal dimension of the bores.

This process is completed
after approx. 20 min.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

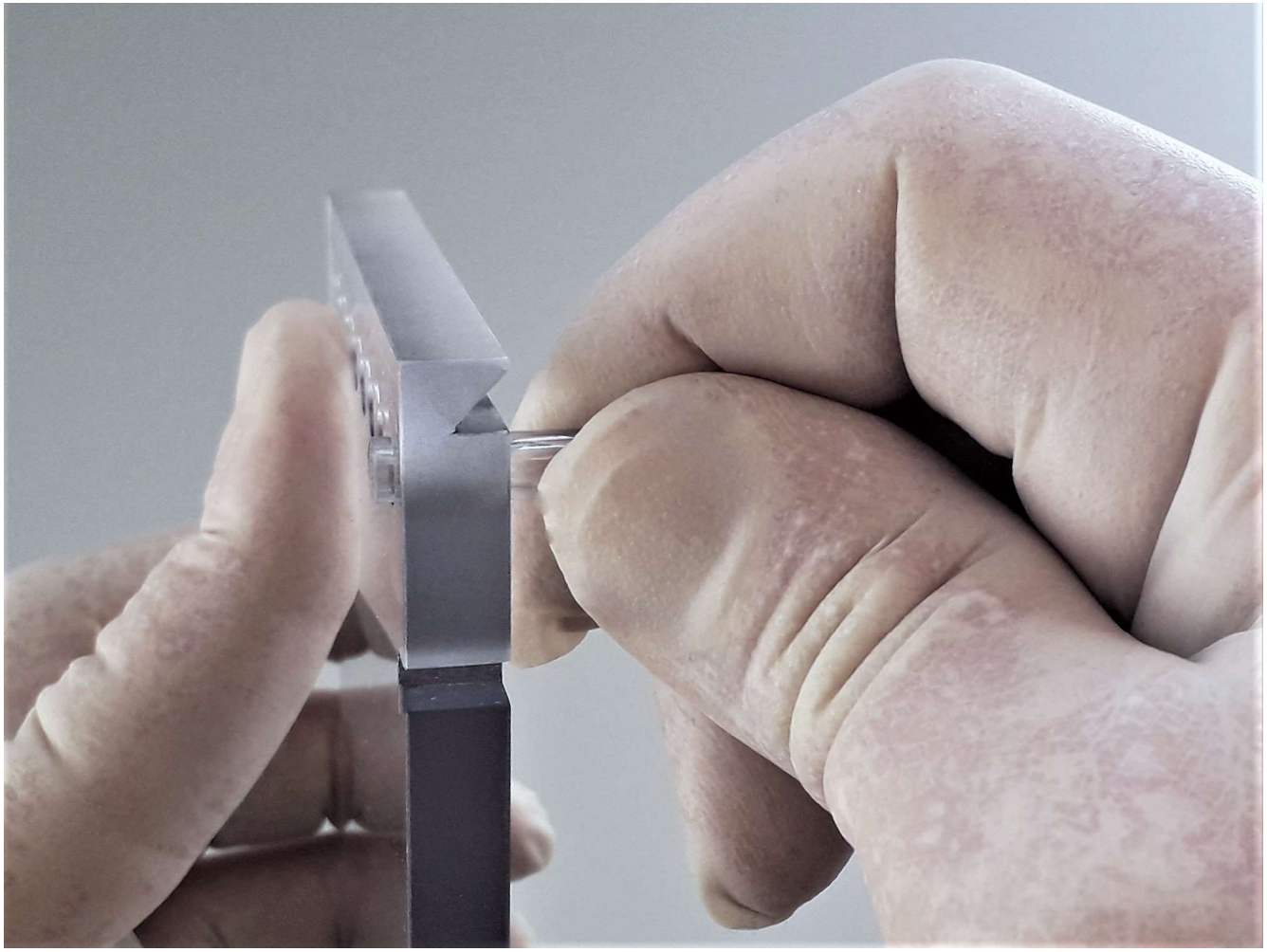


Hardware System for the production of

Artificial Thrombi

Up to 8 tubes at a time are processed into reclosable rings.

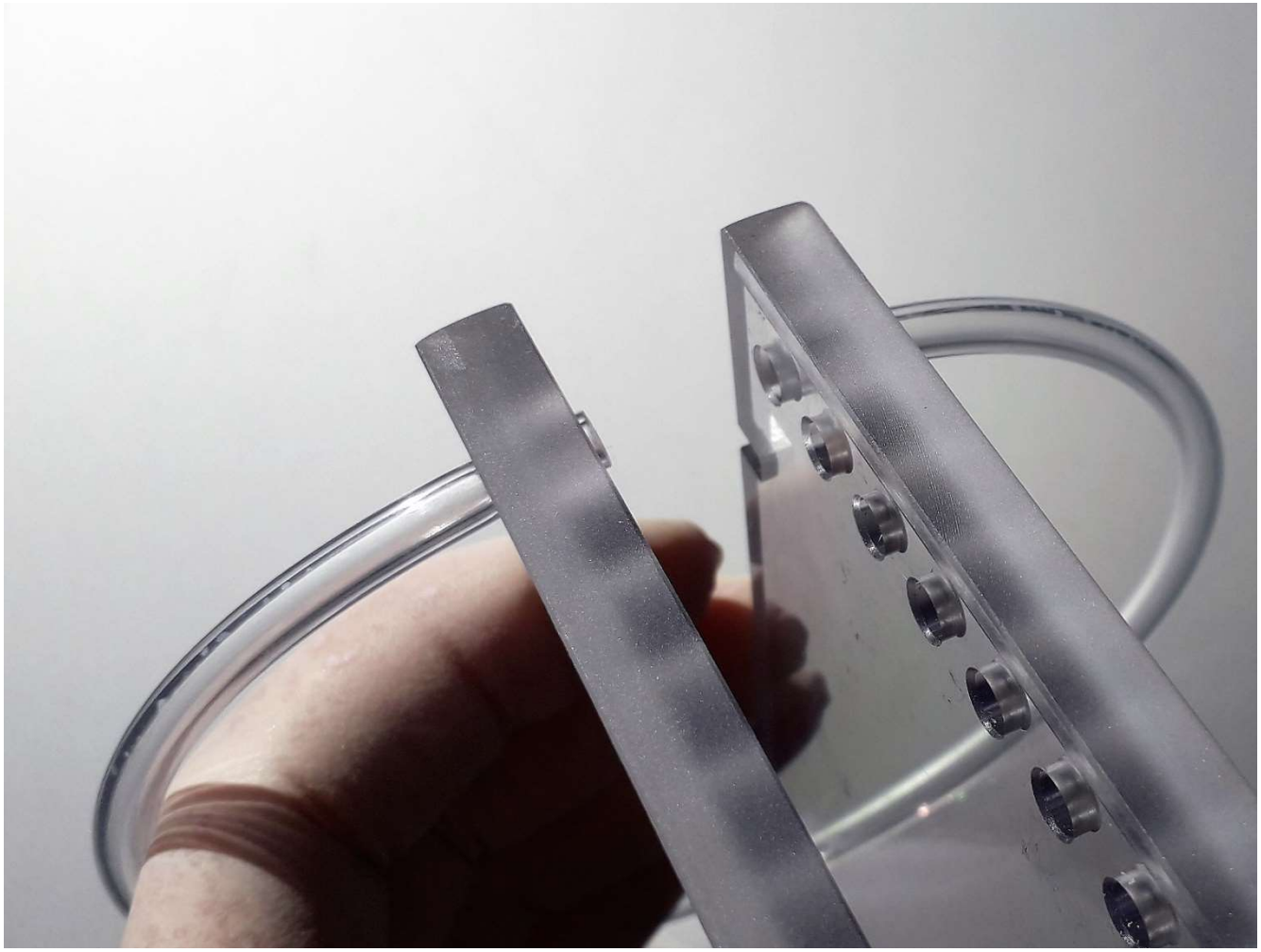
The two plug-in plates and the four claping sleeves are identical. This avoids confusion



Hardware System for the production of

Artificial Thrombi

The tube ends can be easily inserted into the holes of th retaining plates
and still hold very firmly there for along time.



Hardware System for the production of

Artificial Thrombi

On one side, the tube ends protude
about 2 mm beyond the plate surface.

On the opposite side, the tube ends remain
below the pate surface.

This arrangement results a tight connection
to close the tube rings,
which can be reopened as often as required.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

All the steps decribed so far can be performed at any time.

The hot phase
Working with whole blood

All of the following steps are time-critical and must therefore be reproduced quickly, cleanly and without errors.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

Hardware System for the production of

Artificial Thrombi

The tubing rings are filled with blood in a time-saving manner using a 8-place pipette.

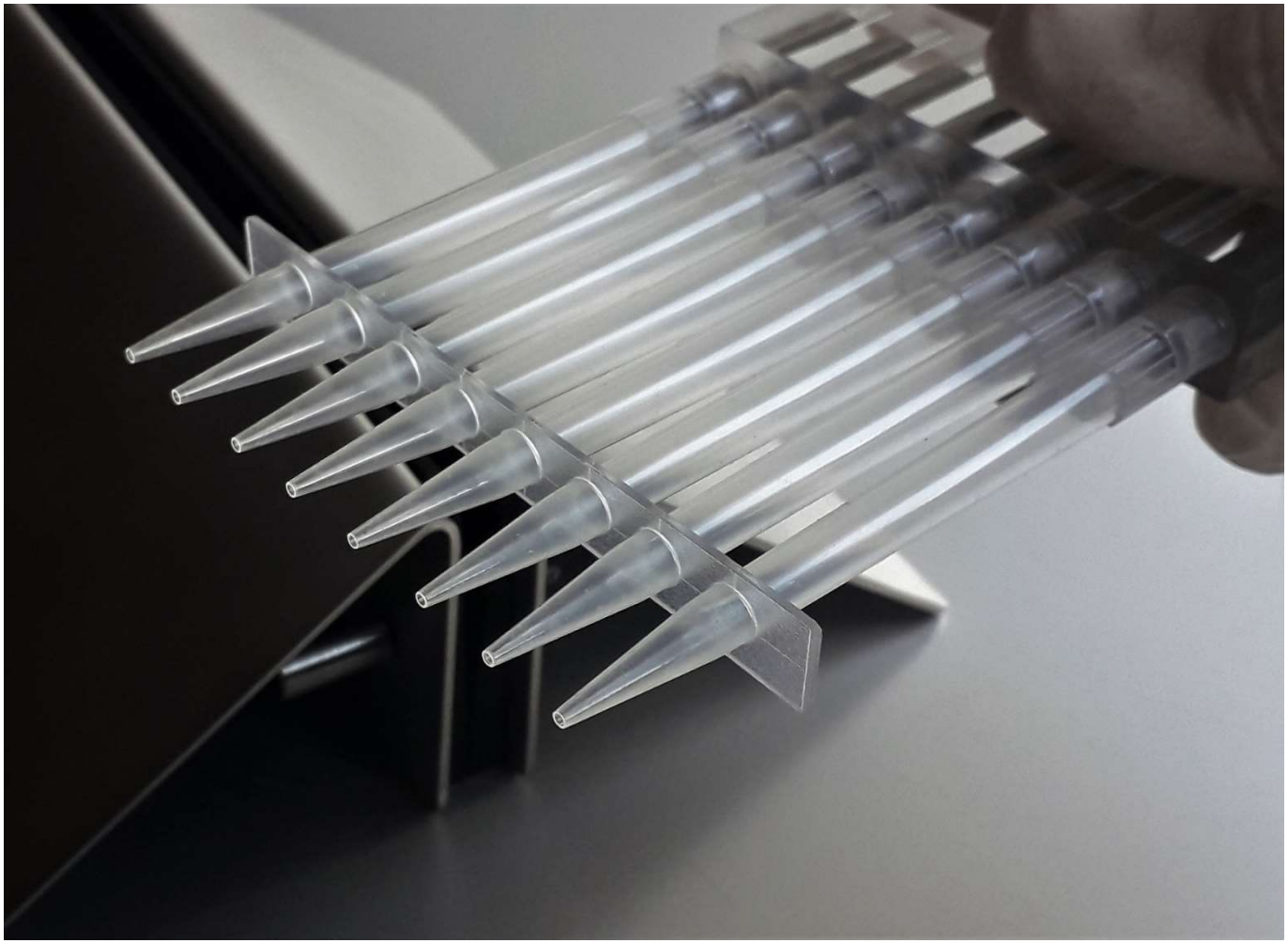
However , the pipette tips are not precisely positioned as standard.

ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com

Hardware System for the production of

Artificial Thrombi

They are positioned exactly by attaching a template.



Hardware System for the production of

Artificial Thrombi

The tips are then exactly in line and have equal distances.

Hardware System for the production of

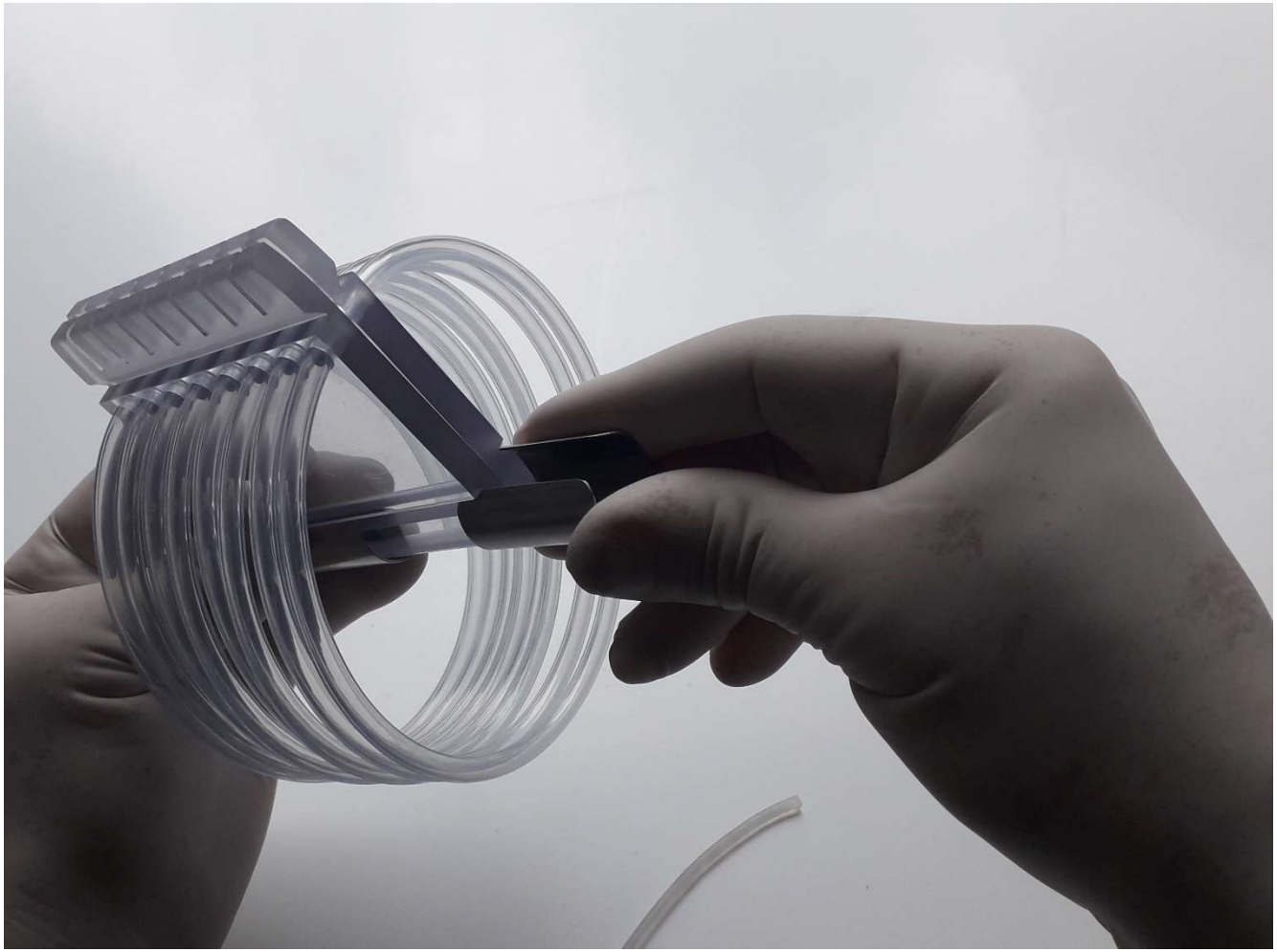
Artificial Thrombi

For filling the prepared tubular ringpackets with the multiple pipette,
a sturdy stand provides the necessary stability.

Hardware System for the production of

Artificial Thrombi

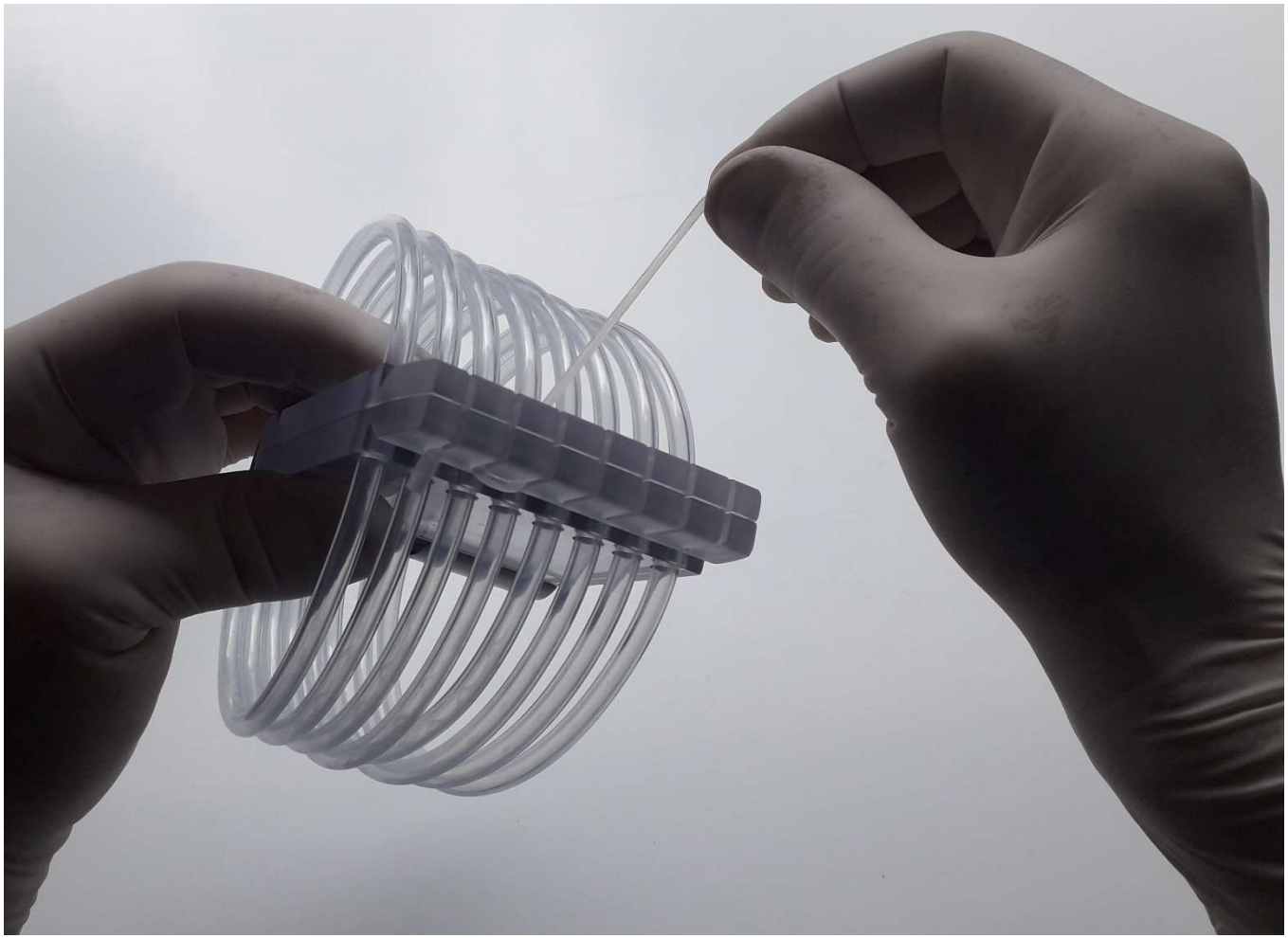
This allows the pipette tips to be precisely positioned and pressed on tightly.



Hardware System for the production of

Artificial Thrombi

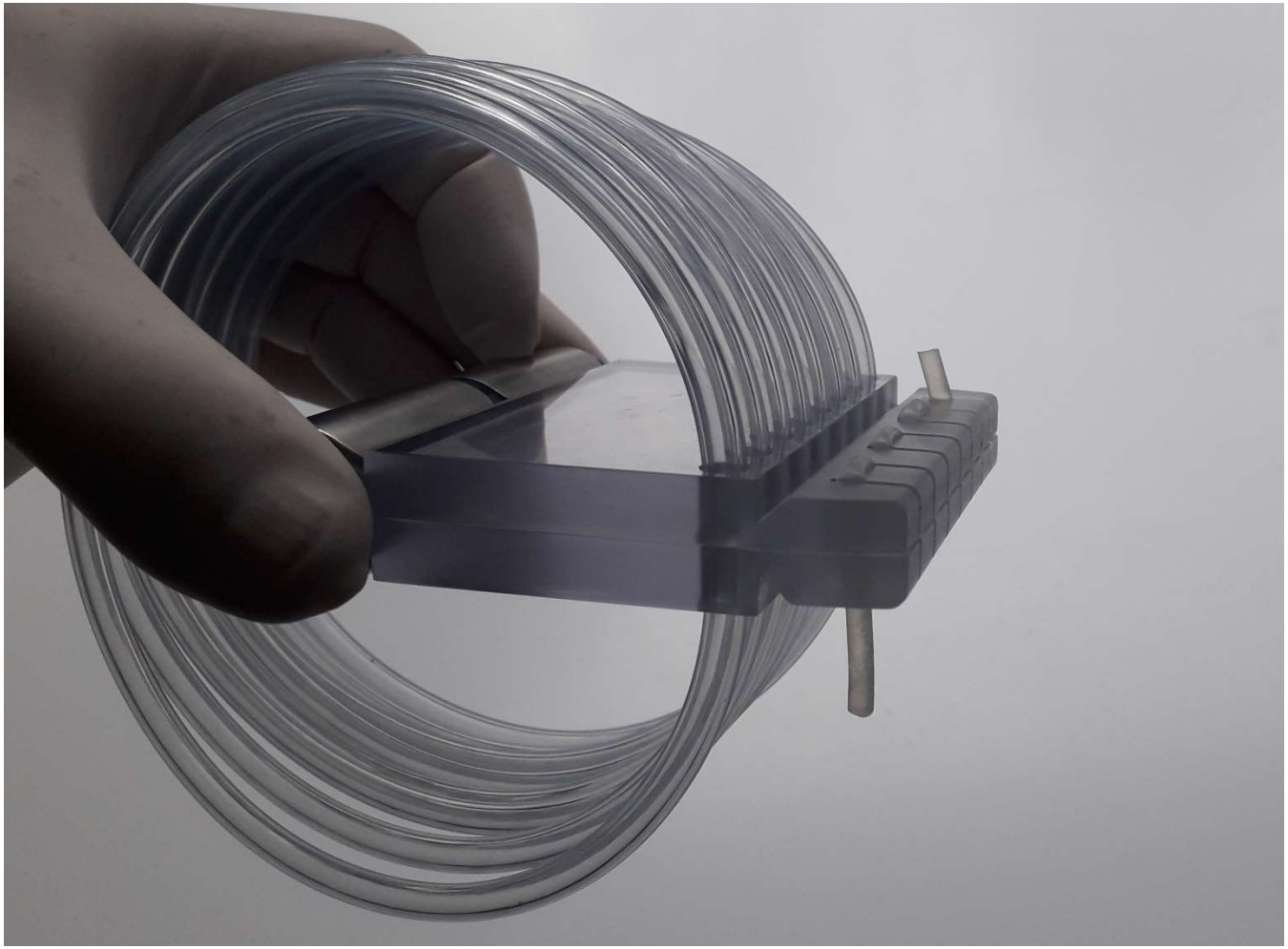
The clamping sleeves are inserted without tools and connect the 8-place tubing package into a handy unit.



Hardware System for the production of

Artificial Thrombi

Both plates are covered with a silicone thread connected very quickly, safely and without tools.

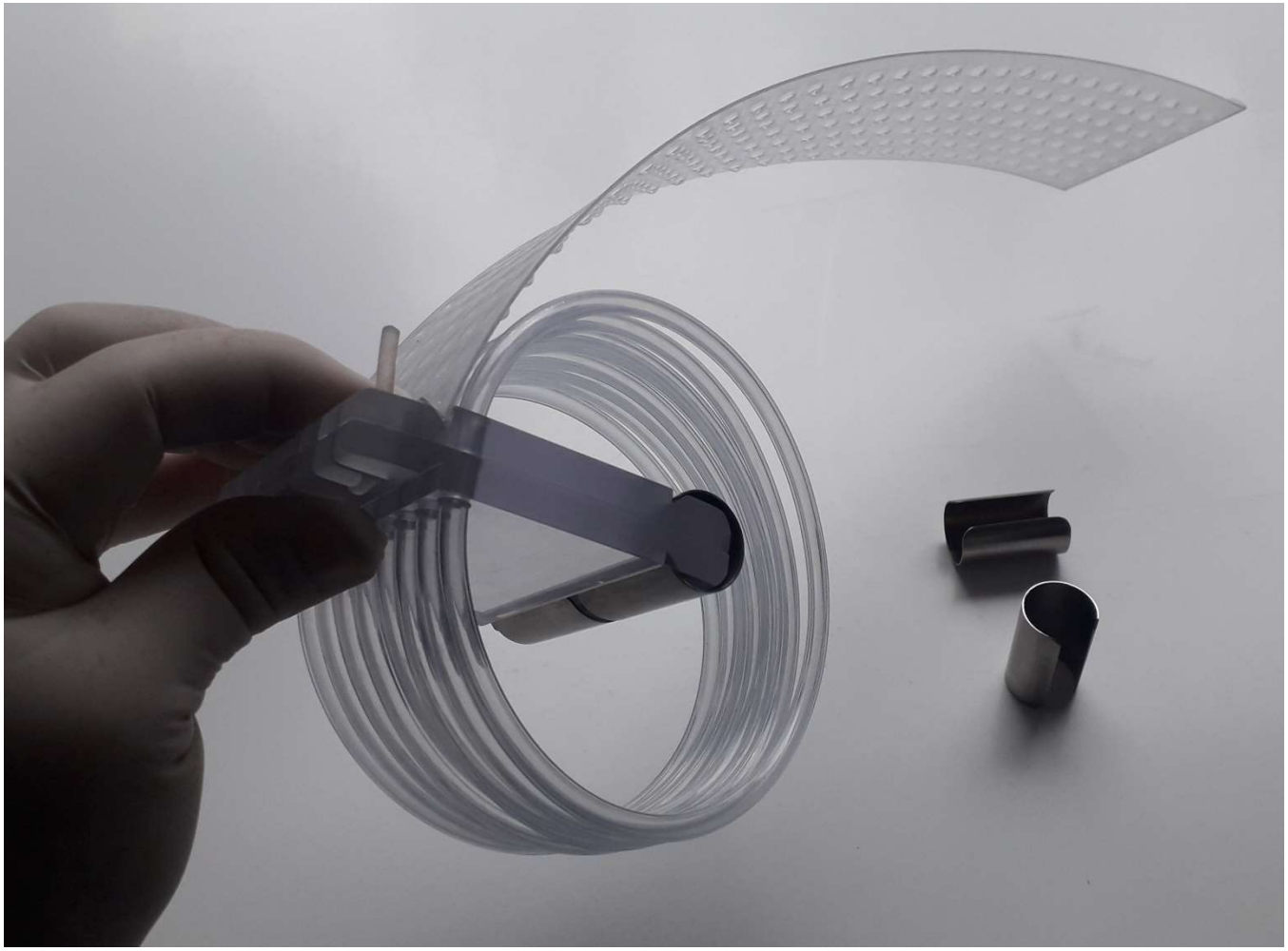


Hardware System for the production of

Artificial Thrombi

The high contact force ensures a gap-free connection.

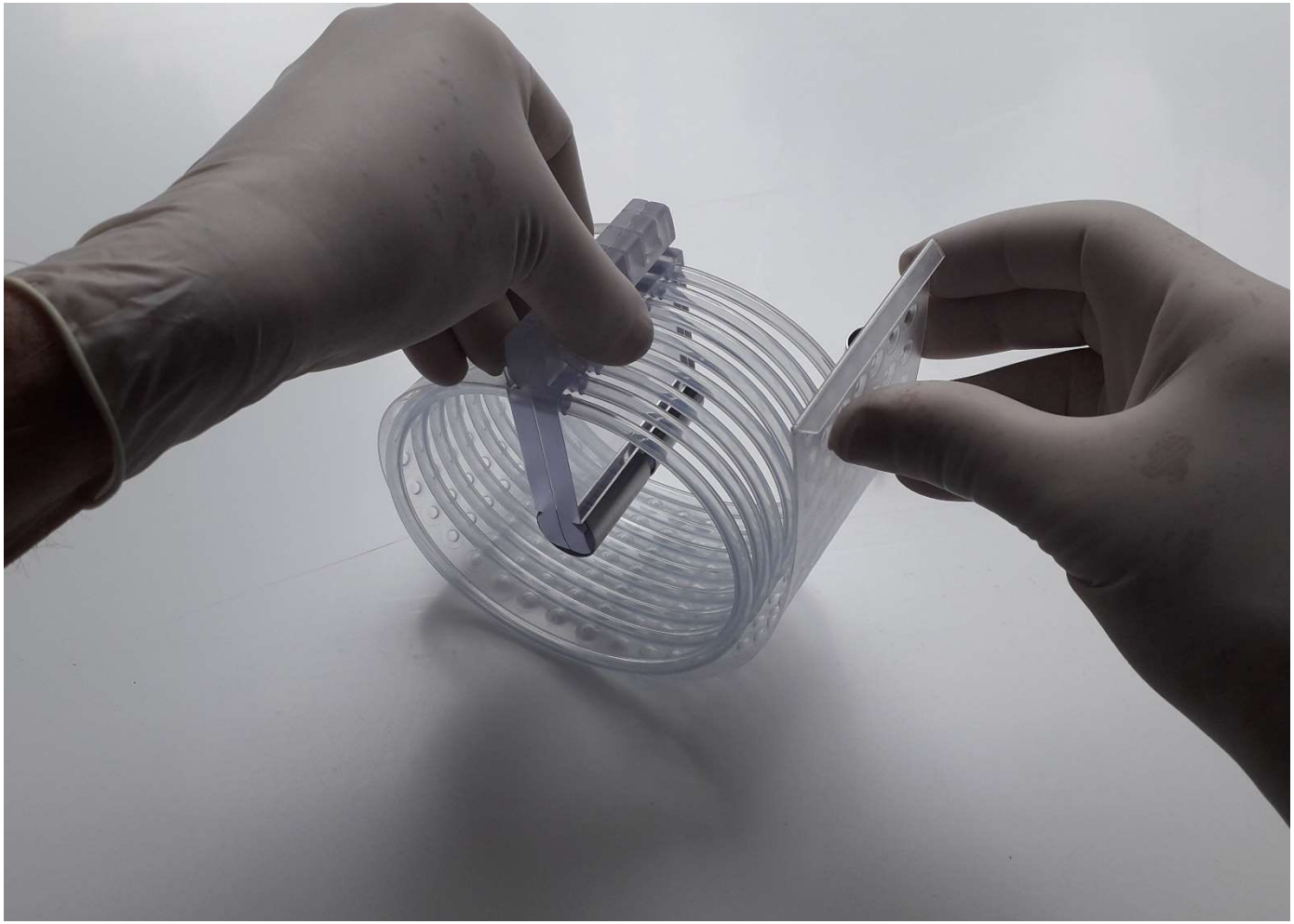
ebo kunze | **industriedesign** Im Dentel 17 72639 Neuffen 07025 844644 ebo.kunze@chandlerloop.com



Hardware System for the production of

Artificial Thrombi

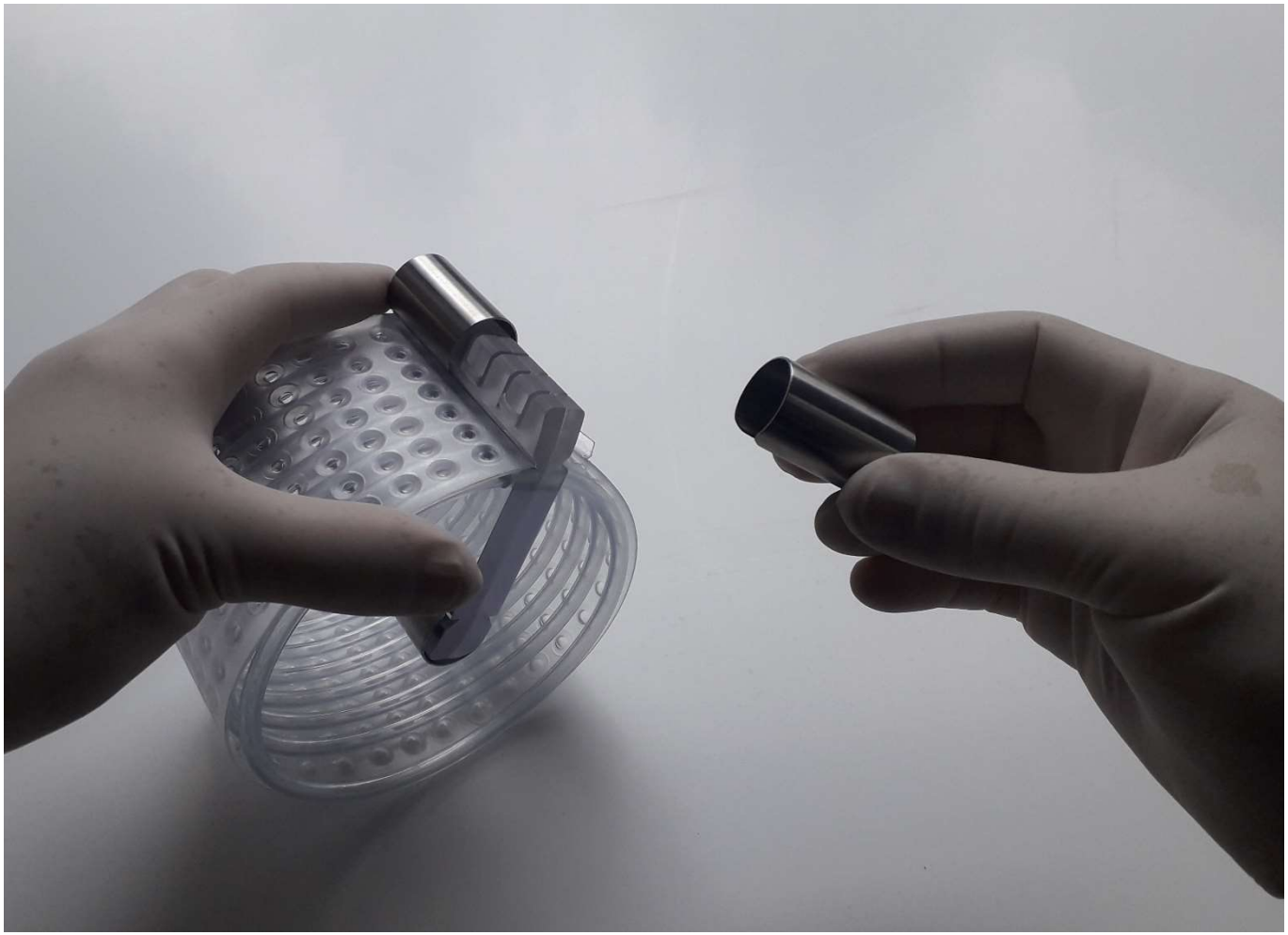
The plastic cover keeps the tubing rings in shape.



Hardware System for the production of

Artificial Thrombi

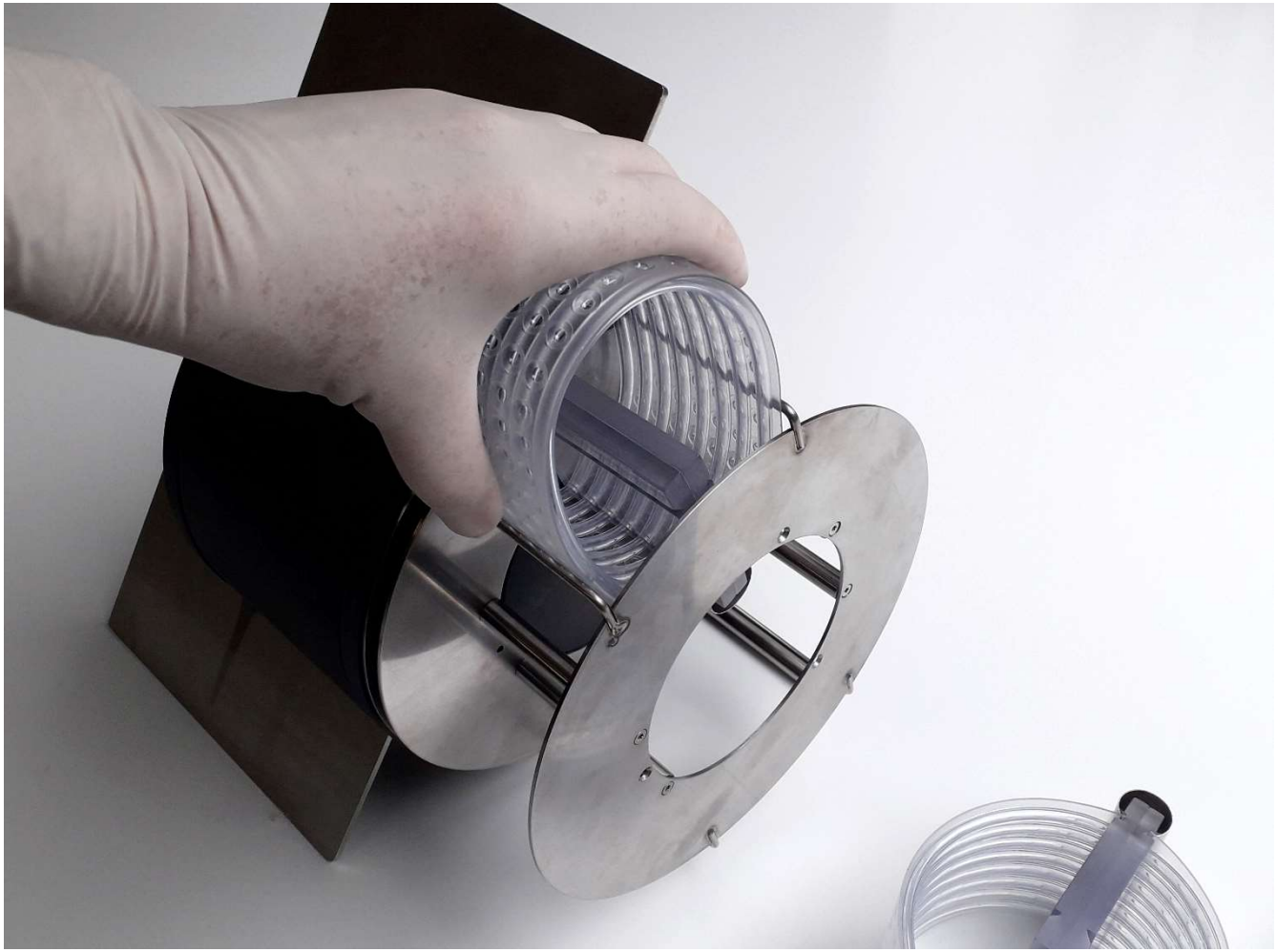
Putting on the plastic cover, the tubing rings arrange themselves automatically.



Hardware System for the production of

Artificial Thrombi

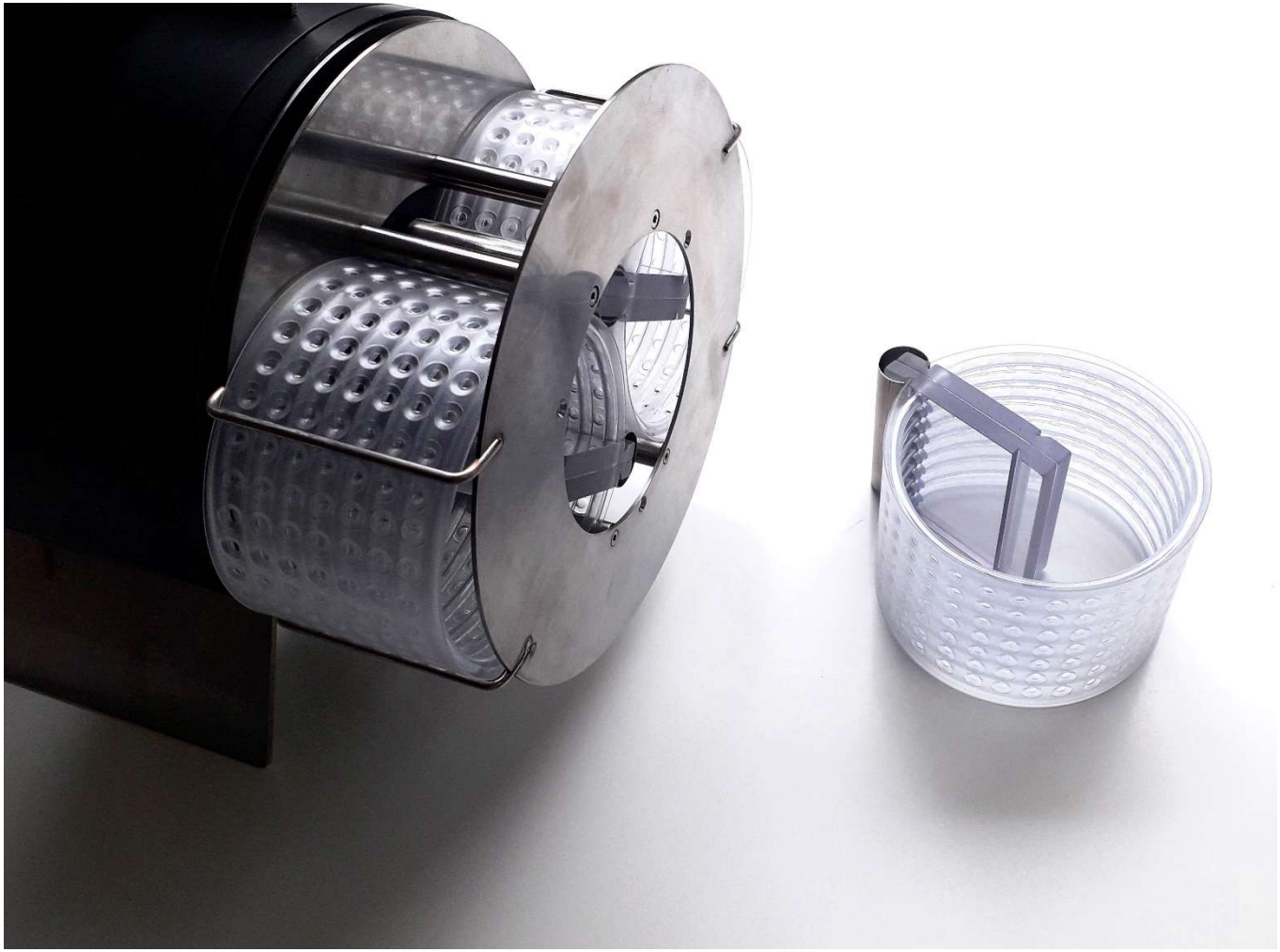
The clamping sleeves connect everything into one durable unit.



Hardware System for the production of

Artificial Thrombi

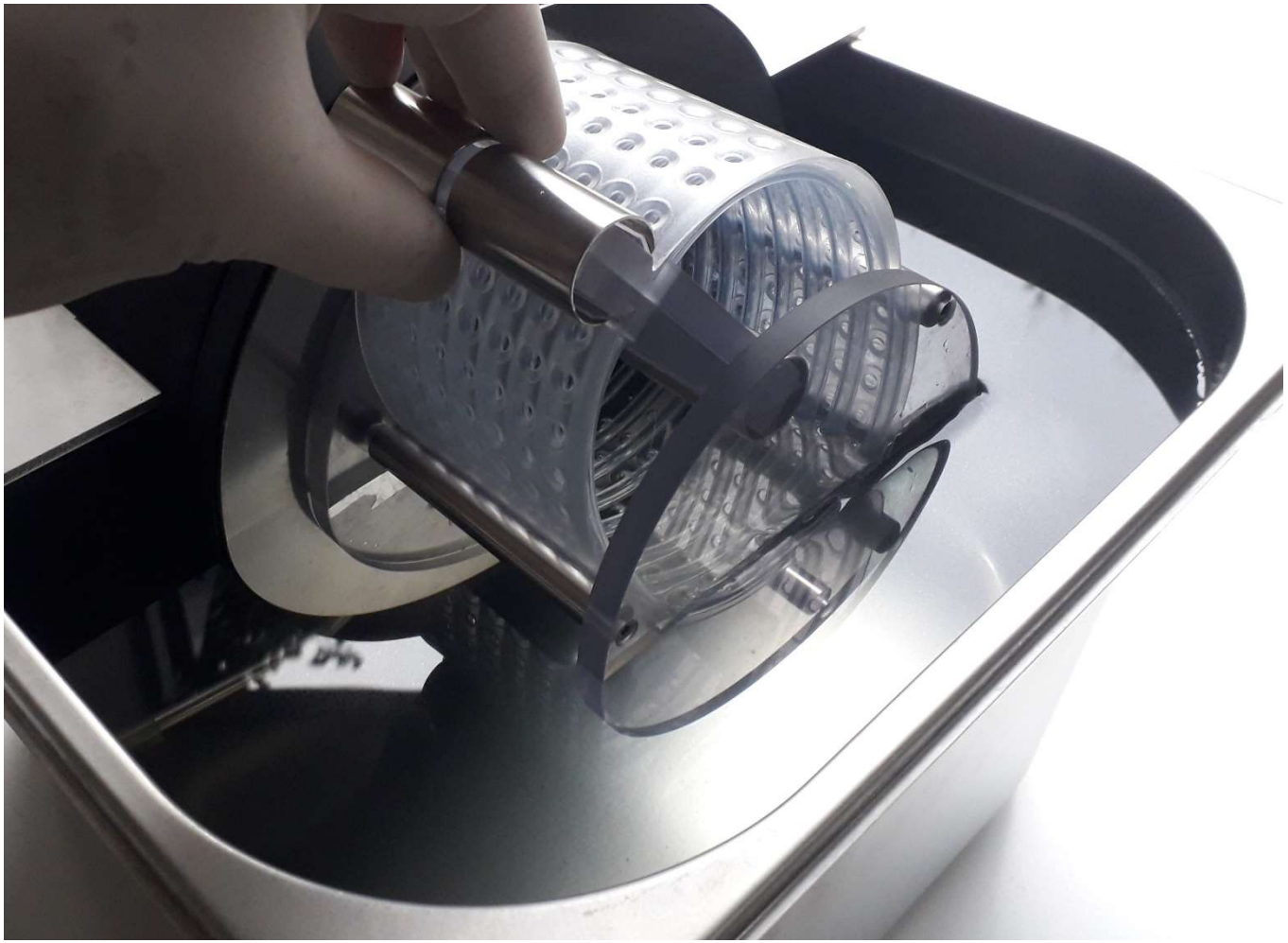
The tubing assemblies can be simply inserted into the cages of the Chandler-loop-System and processed there.



Hardware System for the production of

Artificial Thrombi

As standard, there is space for two units i.e 16 tube rings at a time.
An extended cage doubles the capacity to 32 rings.
Parallel processing of up to 92 thrombo-loops optional.



Hardware System for the production of

Artificial Thrombi

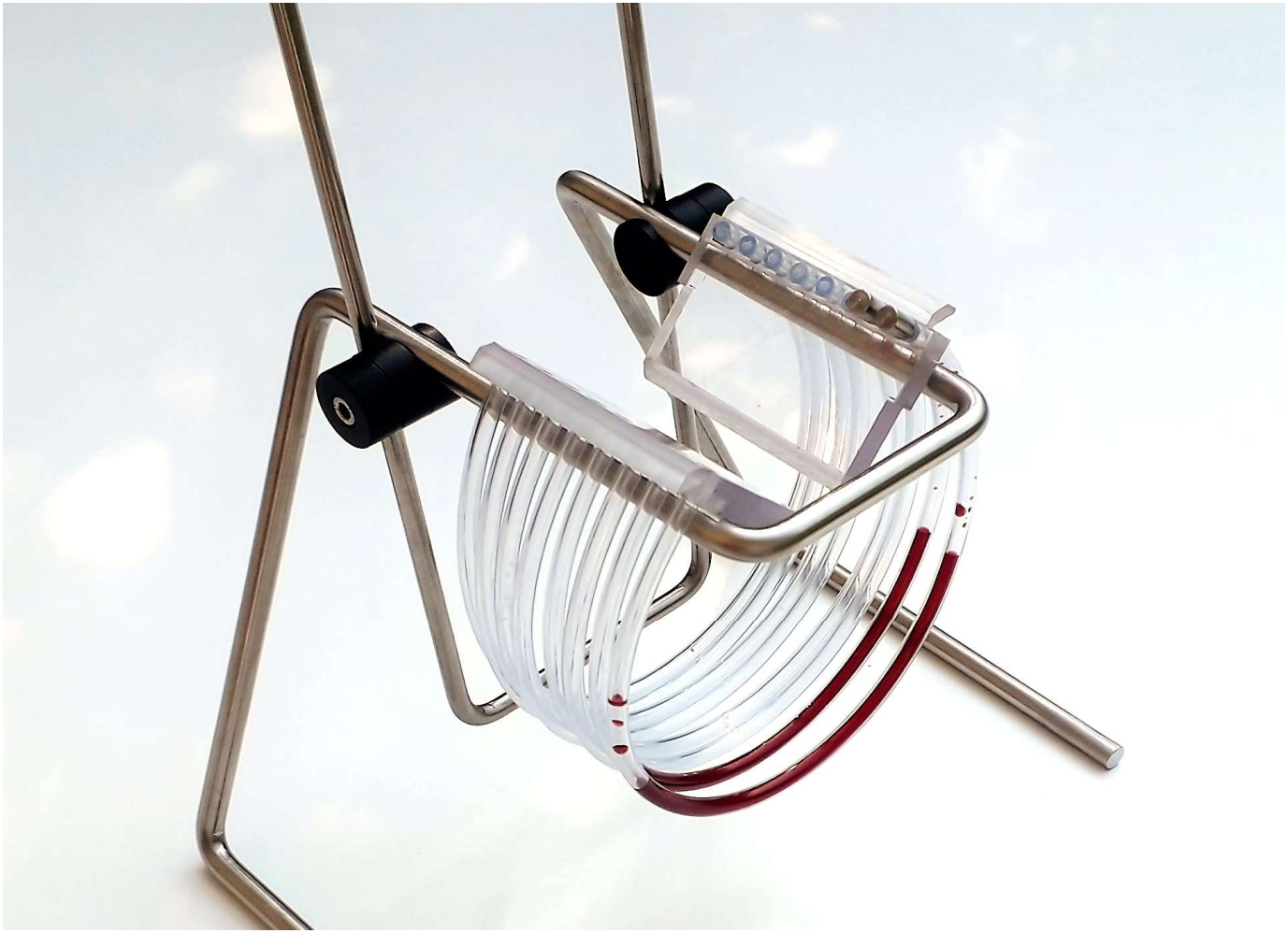
The tubing assemblies can be simply inserted into the cages of the Chandler-Loop-System and processed there.

Hardware System for the production of

Artificial Thrombi

The rotation starts.

40 sec. from filling with blood to here.
10 sec. return to emptying.



Hardware System for the production of

Artificial Thrombi

For post-processing, now again in non-time-critical mode, the stand is used again.

After opening the rings, one end of the tube is closed with a plug.

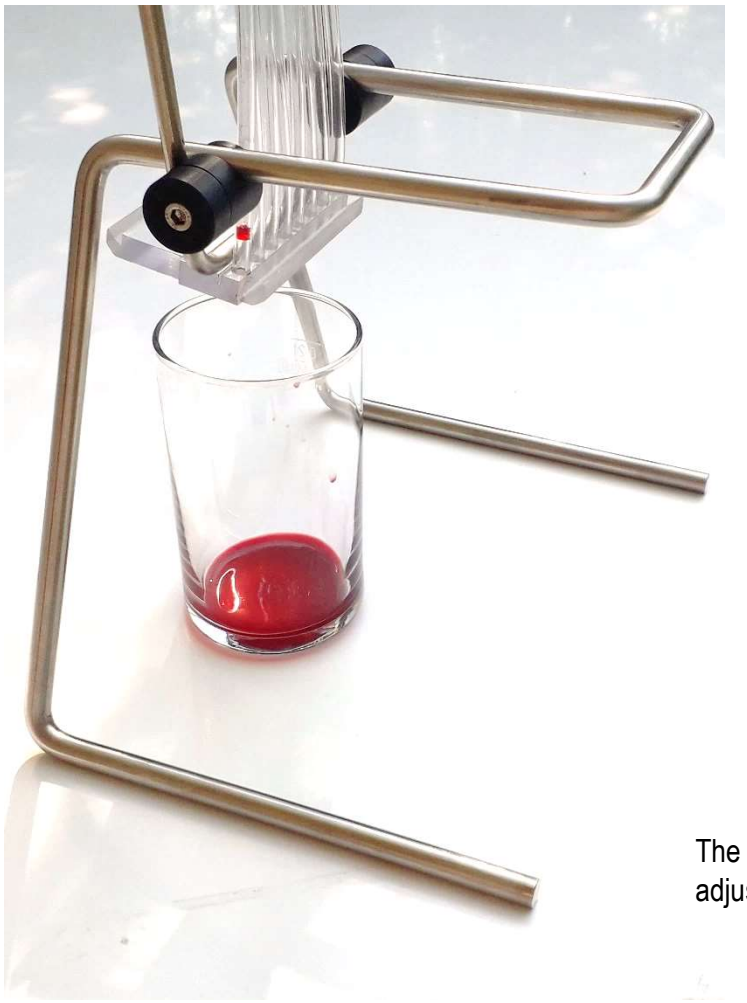
Hardware System for the production of

Artificial Thrombi

The tube bundles can then be stretched without the risk of blood leaking out

It is hung vertically in the stand with the plugged side facing up.

By removing the plugs, each tube can be emptied and rinsed separately.



The free working height can be adjusted as required.