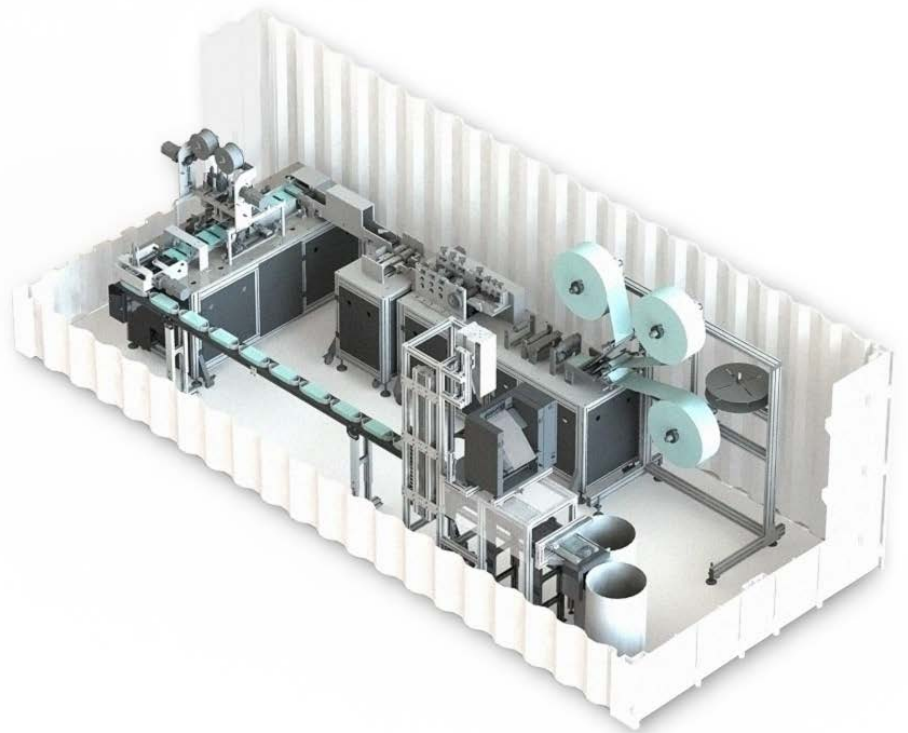


Production line Medical face masks according to DIN EN 14683

Powered by pi4



- + Face masks are in short supply due to the corona crisis and thus endanger people's health
- + Face masks are currently expensive due to the increased demand
- + It is important to produce locally, as every country currently has high demand

Assessment of face mask demand

- 1.2 million medical and non-medical staff were working in German hospitals in 2017
- 500 thousand hospital beds and 28 thousand intensive care beds were available in 2017
- 172 thousand private practice doctors work with 250 thousand medical staff in 101 thousand practices and deal with 553 million treatment cases, resulting in 1 billion patient contacts per year
- It can be assumed that every German citizen has to wear a mask and wear this mask for a month. So our current annual demand would then be a further 960 million masks, in addition to those for medical staff. This corresponds to 32 pi4-respiratorbot production lines, just for the German Federal Republic.

Federal Minister of Economics Peter Altmaier expects a demand of up to twelve billion protective masks per year for Germany.

Specification of the PBHC0001

- The fully automatic machine has been designed for mouth-nose protection with a fixed mouth-protection size of 175 x 95 mm
- Certification of the masks as medical products must be arranged by the customer
- Mouth-and-nose protection produced with the equipment does not fulfill any FFP class
- Technical cleanliness of the environment must be ensured by the customer. Alternatively, we recommend an option of our container enclosure with air conditioning and air purification.

Product features

| Description | Material | Specification |
|---------------------------|----------------------------------|---|
| Mouth-and-nose protection | – | 175 x 95 mm |
| Inner layer | Spun-bonded fabric, single layer | 195 x 175 mm initial width 25 x 50 g/m ² or comparable material |
| Outer layer | Spun-bonded fabric, single layer | 175 x 175 mm 25 x 50 g/m ² or comparable material |
| Center layer | Non-woven, melt-blown fabric | 175 x 175 mm 20 x 50 g/m ² or comparable material |
| Folds | Triple | – |
| Nose bar | PU insulated wire | Width 3 – 4 mm Wire diameter 0.4 mm Length 130 mm |
| Ear loops | PA elastic cord | Diameter 3 – 4 mm Length 140 mm Weldable material |

Description of mouth-and-nose protection

- High resistance to liquids
- Good breathability
- Inner and outer surfaces are clearly marked

Standards

- EN 14683 Type IIR high performance in bacterial efficiency, breathing and splash resistance
- ASTM F2100 Level 1 or Level 2 or equivalent
- Fluid penetration resistant at pressure of at least 120 mm Hg based on ASTM F1862-07, ISO 22609 or equivalent
- Breathability: MIL-M-36945C, EN 14683:2019+AC, or equivalent
- Filtration efficiency: ASTM F2101, EN 14683:2019+AC or equivalent standards. Reusable (produced in robust material that can be cleaned and disinfected) or usable as a single use article

General performance and technical data of the machine

| | |
|---|--|
| Footprint | 4.9 x 2.3 x 1.9 m (L x W x H) |
| Permissible ambient conditions | min. 15 °C, max. 35 °C, max. 70 % relative air humidity, without condensation, short-term fluctuations are not permitted |
| Electric power connection rating | 230 / 400 V, 50 Hz |
| Pneumatic connection | Specified value within the limits of 5.5 to 10 bar, consumption 350 liter/h, compressed air purity class according to ISO 8573-1 |

The plant is secured by a protective fence for reasons of occupational safety. Installation and system operation in a 20 foot sea freight container (6.05 x 2.44 x 2.59 m) is possible.

Advantages

- + Compact design with small footprint
 - + Convenient access for maintenance activities
 - + High performance, up to 50 masks / minute
 - + Maximum number per bag: 10 masks
 - + 26 years experience in mechanical engineering
 - + 100 % developed and manufactured in Germany
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Individual functions

- 1 Cell 105**
 - Station 105 05: Reeling area (fleece and nose bow)
 - Station 105 10: Nose clip application
 - Station 105 15: Profiling / ultrasonic welding / cutting
- 2 Cell 110**
 - Station 110 05: Transport and separation
- 3 Cell 115**
 - Station 115 05: Ear-loop application and ultrasonic welding
 - Station 115 10: Packing

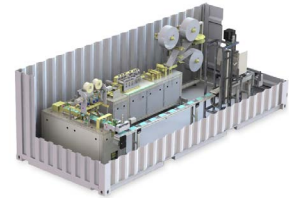


Available options of the production line for mouth-and-nose protection masks

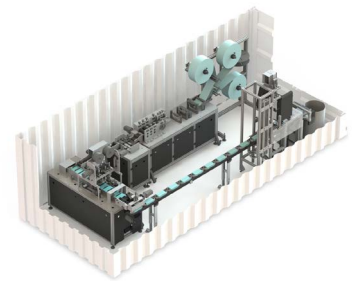
| Description | Concept |
|--|---|
| Specification of the PBHC0002 Option: 20-foot sea freight container | 20-foot sea freight container (6.05 x 2.44 x 2.59 m) as operating environment, with air conditioning unit and air filter. |
| Specification of the PBHC0003 Option: Bag packing | <p>The masks are conveyed out of the machine in stacks and sealed in LDPE bags.</p> <p>The customer can use a container at the end of the conveyor belt to collect the bags (container height approx. 700 mm).</p> <p>Cycle time: up to 10 bags per minute with up to 10 masks per bag Free passage or stacking height: up to 85 mm Bag thickness: 35 to 100 µm Bag sizes: Width 55 to 260 mm, length 100 to 420 mm</p> |
| Specification of the PBHC0004 Option: Printing the bag packaging | <p>The masks are conveyed out of the machine in stacks and sealed in LDPE bags.</p> <p>The customer can use a container at the end of the conveyor belt to collect the bags (container height approx. 700 mm).</p> <p>Cycle time: up to 6 bags per minute with up to 10 masks per bag Free passage or stacking height: up to 85 mm Bag thickness: 35 to 100 µm Bag sizes: Width 55 to 260 mm, length 100 to 420 mm</p> |
| Specification of the PBHC0005 Option: Factory outlet sale (requires sea freight container option) | <p>The products, packed in LDPE bags can be ordered, paid for and purchased directly at a payment counter.</p> <p>A robot system hands over the products to the customer.</p> <p>Payment can be made by cash, EC- and credit card or card with a RFID (NFC) chip.</p> |

Advantages

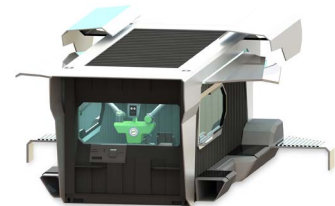
- Integrated air conditioning and air purification
- Cleanroom requirements fulfilled
- Easy worldwide transport
- Production directly at the place of need
- Scalable production concept
- No additional transport packaging necessary



- Fully electronic system requires no external compressed air connection
- The rotatable machine allows fastest change of bag formats
- Good possibility of loading and safe closing of the bags
- Operator-friendly display
- On-board diagnostics allow easy maintenance
- Next-bag-out printing function ensures accurate printing
- Integrated air release device
- The bags are counted and fall directly counted into a prepared cardboard box
- The printer can print individual high-resolution barcodes, texts or labels directly on the bag
- Production of separate labels is not necessary
- The printer contains a maintenance-friendly tilting print head
- Optional design software can be used for easy label creation



- No packaging and transport effort for the end products
- Production and sale at one location



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