

Phoenix Machinery s.a.l
Safra- Lebanon

Face Mask Machine

Table of Contents

1	INTRODUCTION.....	3
2	SCOPE OF SUPPLY	4
2.1	MAIN MACHINE.....	4
2.2	HOT MELT GLUE SYSTEM.....	8
3	TECHNICAL SPECIFICATIONS.....	9
3.1	TECHNICAL DATA	9
3.1	PRODUCT LAYOUT & SIZES.....	10
4	DOCUMENTATION	11

1 Introduction

Phoenix undertakes to manufacture the equipment listed hereafter, according to specifications, dimensions, and design requirements, as specified in this contract.

Product Name: *SURGICAL FACE MASK MACHINE*

Product Code: *FM-500*

Product main function and features:

The machine is a production line for Face Masks. It is capable to make product with the structure consisting of:

- Three Layers Mask
 - Outer Layer (spunbond)
 - Middle Layer (Melt Blown)
 - Inner Layer (Thermal Bonded)
- Nose Wire
- Elastic Ear Loops

2 Scope of Supply

2.1 Main Machine

2.1.1 In-line feeding system for “Outer Layer”

- Unwind for two reels alternatively running; equipped with two motors driving pneumatic expanding spindles.
- Expanding spindles with measuring ruler.
- One automatic splicing unit, zero speed type.
- One dancer accumulates the web and allows an automatic splicing at machine running speed.
- Sensors for web breaks detection
- Sensor for splice tape detection
- Electronic web alignment equipment with sensor reading one side of the web.

2.1.2 In-line feeding system for “Middle Layer”

- Unwind for two reels alternatively running; equipped with two motors driving pneumatic expanding spindles.
- Expanding spindles with measuring ruler.
- One automatic splicing unit, zero speed type.
- One dancer accumulates the web and allows an automatic splicing at machine running speed.
- Sensors for web breaks detection
- Sensor for splice tape detection
- Electronic web alignment equipment with sensor reading one side of the web.

2.1.3 In-line feeding system for “Inner Layer”

- Unwind for two reels alternatively running; equipped with two motors driving pneumatic expanding spindles.
- Expanding spindles with measuring ruler.
- One automatic splicing unit, zero speed type.
- One dancer accumulates the web and allows an automatic splicing at machine running speed.
- Sensors for web breaks detection
- Sensor for splice tape detection
- Electronic web alignment equipment with sensor reading one side of the web.

2.1.4 Pulling Station

- Main Puller used to pull all three webs; the Outer, Middle and Inner Layers
- Puller is sevodriven
- Pressing Roller with Rubber coating

2.1.5 Wire Application System

- Free Unwind for one spool nose strip
- Straightening wheels
- Pulling section
- Cutting section with Hardened anvil

2.1.6 Longitudinal Folding

- Sides folding mechanism with lateral adjustment
- Folding mechanisms are mounted on linear rails for easy adjustment

2.1.7 Longitudinal Thermo-Sealing:

- Unit is aimed to seal the edges of mask.
- Steel frame.
- Heated roll with continuous pattern suitable for all sizes.
- Standard chromium anvil
- Pneumatic loading system
- Temperature controller
- Independent servo driven

2.1.8 Triple Folding Mechanism

- Conical wheels to initiate triple folding
- Folding fins with lateral adjustment
- Folding mechanisms are mounted on linear rails for easy adjustment

2.1.9 Mask End Thermo-Sealing:

- Unit is aimed to seal the ends of mask.
- Steel frame.
- Heated roll with continuous pattern suitable for all sizes.
- Standard chromium anvil
- Pneumatic loading system
- Temperature controller
- Independent servo driven

2.1.10 In-line feeding system for “Elastic Layer”

- Unwind for two reels alternatively running; equipped with two motors driving pneumatic expanding spindles.
- Expanding spindles with measuring ruler.
- One automatic splicing unit, zero speed type.
- One dancer accumulates the web and allows an automatic splicing at machine running speed.
- Sensors for web breaks detection
- Sensor for splice tape detection
- Electronic web alignment equipment with sensor reading one side of the web

2.1.11 Elastic folding Mechanism

- Stretch folding plates to allow reducing ear loop width to match mask width

2.1.12 Stretch Material Fold Thermo-Sealing:

- Unit is aimed to seal the fold of the stretch material used for ear loop
- Steel frame.
- Heated roll with continuous pattern suitable for all sizes.
- Standard chromium anvil
- Pneumatic loading system
- Temperature controller
- Independent servo driven

2.1.13 Cut & place unit for “Ear Loop”.

- Cut & place unit with hard steel knife.
- Vacuum Drum type.
- Vacuum sensor, alarming on lack of pressure.
- Felt lubrication roller fed by independent oil-tank.
- Presence Sensor checking cut pieces on the drum
- Ear Loop is fixed by hot melt glue

2.1.14 Transport conveyor:

- vacuum conveyor drives the product towards the ears sealing station
- Vacuum is supplied via one centralized fan.
- Vacuum gates installed to adjust vacuum level.
- Stainless steel belt bed support.
- All Sandwich conveyors have gap adjustment.

2.1.15 Ears Sealing

- Unit is aimed to reinforce Ear loop on Mask Body.
- Steel frame.
- Heated roll with continuous pattern suitable for all sizes.
- Standard chromium anvil
- Pneumatic loading system
- Temperature controller
- Independent servo driven

2.1.16 Ejection System for defected product

- Line equipped with One ejection gates right after the final cut station. Pneumatic actuation.

2.1.17 Final cutting unit:

- Transversal cutting unit.
- Lubrication system fed by centralized oil tank.
- Independent servo driven.

2.1.18 Machine Frame rugged steel with epoxy painting:

Three modules frame made of:

- Steel beams.
- Steel panels connected to the frame with screws.
- All units with independent frame are connected to the main frame with screws.
- Each machine section is held on an adjustable feet.

2.1.19 Fans and duct system.

- One Dedicated Fan with distribution ducts for vacuum conveyor
- All ducts supplied according to machine layout at phoenix are included in the offer.

2.1.20 Pneumatic system:

- Distribution line for compressed air equipped with backup tank, filter, water separator & automatic drain.
- Quick couplings, sockets & valves are used to connect each application to distribution line.
- Individual glue spray applications are protected by filter regulators.
- Required air pressure: 6 bar
- Required filter mesh: lower than 40 micron.

2.1.21 Safety guards and covers:

- Transparent safety door with heavy duty aluminum frame and locking safety switches on the operator side.
- Safety doors made of aluminum frame at the drive side. One Beam sensor covering the length of the machine & detecting any back door opening.

2.1.22 Jig hoist:

- Two Jig hoists are used for material loading

2.1.23 Edge Control Units:

Electronic web alignment equipment, with sensor positions adjustable with safety cover closed.

- One for middle layer
- One for outer layer
- One for inner layer
- One before wire application
- One before end sealing
- One for elastic layer

2.1.24 Main Control Panel, including machine drives, PLC etc.

- Programmable logic controller Siemens S7 plc with PROFINET communication port.
- Special SIEMENS functions for intermittent application of glue.
- Special SIEMENS functions for motion correlation and synchronization.
- Motion control drives Siemens for position control of servomotors.
- Electronic motor soft starter
- SIEMENS signal conditioners and converters

2.1.25 Electrical Hardware

- Remote inputs/outputs for simple wiring and easy commissioning.
- Brushless servomotors for accurate speed/position control.
- Touch panel Siemens for interfacing all machine sections and process data entry.
- Multi-pin connectors
- Push buttons, selector switches and emergency stops.
- Proximity and photoelectric sensors
- Pressure and vacuum switches
- Enclosure with Cooling units

2.2 Hot Melt Glue system

2.2.1 Ears application:

- Melting system
- Glue application on Elastic material before cut and place
 - Two Coating Heads
 - Two Single pumps
 - Two heated hoses

3 Technical Specifications

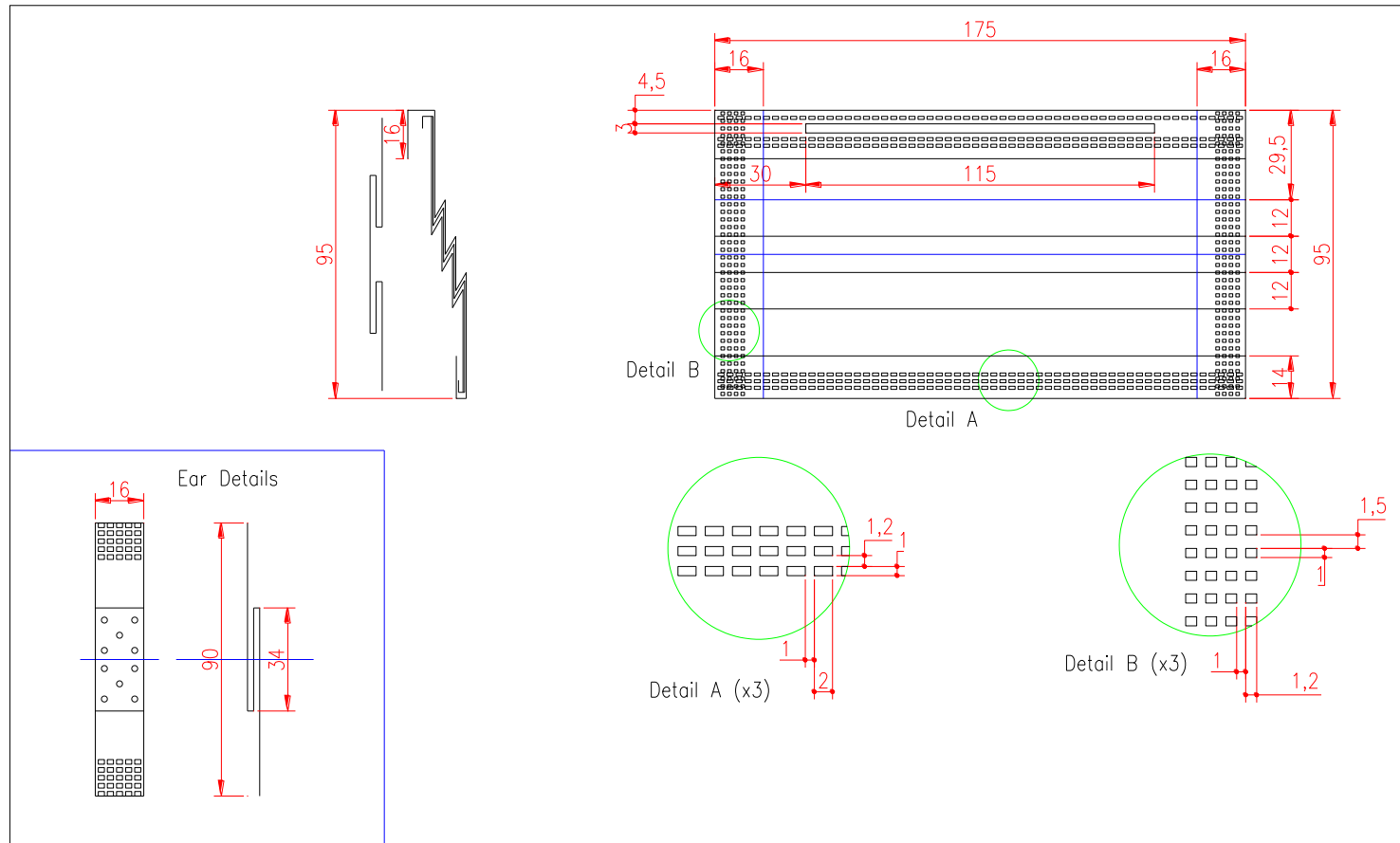
3.1 Technical Data

Product:	Surgical Face Mask
Production speed fluffy product	Up to 500 pcs/min
Production linear Speed	90 m/min max

List of brands for major components:

- Controls; Drives: Siemens
- Sensors: Festo, Omron, Sick
- Bearings: SKF, INA, FAG
- Solenoid Valves: Festo
- Web Guides: Fife
- Glue Systems: Valco Melton
- Fans: VIMEC, Euroventilatori
- Planetary gear: Planetroll, A&G
- Flat Belts: Habasit, Silicon PU

3.1 Product Layout & sizes



4 Documentation

Phoenix to supply in English:

- One (1) "Installation, operation, maintenance, and safety instructions" manual
- One (1) set of pneumatic diagrams
- One (1) set of electrical wiring diagrams
- One (1) mechanical and electrical parts list
- One (1) list of recommended spare parts