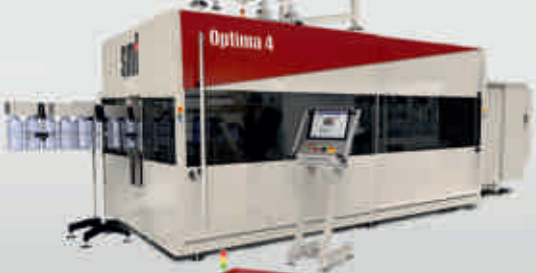
PET PACKING TECHNOLOGY

34000 bph

14000 bph

12000 bph



7000 bph

6000 bph

3500 bph

3000 bph

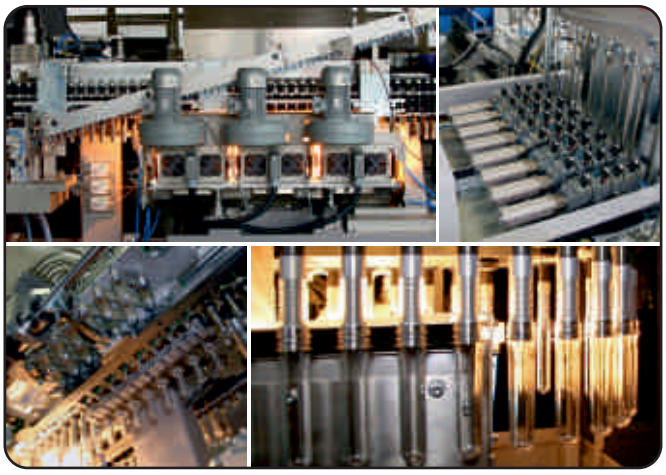
smf

Optima Family

Optima Turbo is a family of 2/4/6/108/16 cavities linear blow moulding machines suitable for many type of bottles and various speed.
This modern machine is fully electric with all vital units such as: closing unit, stretching rods, transmission of preforms between oven & moulds, discharge of ready bottles and oven itself being controlled and steered by servo drives. **Optima machines** are designed for customers interested in high advanced and reliable blower. **Optima's** modern technology allows also to use ultra-light weight preforms and produce difficult shape bottles with highest efficiency.

Key features:

- Modern and durable construction of closing unit-knee locking / geometric locking system
- Equipped with reliable electric servo-drives for all main operations
- Very compact size with maximal output
- Discharging ready bottles from Optima directly on air conveyor
- Energy efficient heating process – NIR lamps instead of traditional IR radiation & low air consumption – air collectors and special valves used in the air recuperation system
- Stable production of perfect bottles – 40 bar blowing pressure & smooth wall thanks to pressure compensation system on closing unit
- Useful equipment for easy operation: Central lubrication system, quick mould change system & Power Wizard based on pyrometers for automatic self-adjustment of the heating process
- High quality components – Mitsubishi/Omron, EATON, Lutze, Phoenix contact, Allan Bradley, Weidmuller, Balluff, Wenglor, Cosmotec Stulz, eWon, Harting, Celduc, Toshiba, Lapp Kabel and other reputable brands
- Easy mould and neck format change
- Preferential heating available on request
- HOT-FILL version available



	Optima 2/1	Optima 2	Optima 2/3	Optima 4 NT	Optima 2 MAX	Optima 8 turbo	Optima 10 turbo	Optima 6 MAX	Optima 4 MAX	Optima 16
	OP 2/1	**OP 2**	**OP 2/3**	**OP4 NT**	**OP2 MAX**	**OP 8 NT**	**OP 10 NT**	**OP 6 MAX**	**OP 4 MAX**	**Optima 16**
cav	**1**	**2**	**3**	**4**	**2**	**8**	**10**	**6**	**4**	**16**
blowing pressure	up to 40 bars									
bottle size	1,0–7,0 L	0,2–3,0 L	0,2–0,6 L	0,2–2,5 L	1,0–5,0 L	0,2–2,0 L	0,2–0,6 L	1,0–3,0 L	1–6 L	0,2–2,0 L
output	ca. 1800 of 1 L	ca. 3500 of 0,5–1 L	ca. 5500 of 0,2 L	ca. 7200 of 0,5–1 L	ca. 3600 of 1,0 L	ca. 14000 of 0,5–1 L	ca. 17000 of 0,2 L			ca. 28000 of 0,5-1 L
	ca. 1500 of 5 L	ca. 3200 of 1,5 L	ca. 5500 of 0,5 L	ca. 6000 of 1,5 L	ca. 3400 of 1,5 L	ca. 12000 of 1,5 L	16000 of 0,6 L	ca. 10000 of 1,0 L	ca. 7000 of 1,5 L	ca. 2400 of 1,5 L
	ca. 1300 of 7 L	ca. 2500 of 3,0 L		ca. 5000 of 2 L	ca. 3000 of 5,0 L	ca. 10000 of 2 L		ca. 9000 of 3 L	ca. 6500 of 5 L	ca. 20000 of 2 L
max diameter of the bottle	170 mm	140 mm	75 mm	105 mm	170 mm	90 mm	75 mm	120 mm	180 mm	90 mm
max height of the bottle	340 mm	340 mm	340 mm	340 mm	340 mm	340 mm	340 mm	340 mm	360 mm	340 mm
max neck diameter	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm	42 mm
max power installed	65 kW	65 kW	63 kW	110 kW	110 kW	160 kW	160 kW	160 kW	210 kW	320 kW
effective power for 1L	13,2 kW (for 5 L bottle)	10,4 kW (for 0,5L bottle)	13,2 kW (for 0,5L bottle)	20,2 kW (for 0,5L bottle)	43,2 kW (for 0,5L bottle)	39,2 kW (for 0,5L bottle)	47,6 kW (for 0,5L bottle)	86,4 kW (for 0,5L bottle)	93,6 kW (for 0,5L bottle)	78,4 kW (for 0,5L bottle)
working air qty (10bars)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)	0,0 Nm^3 (with recuperation)
working air qty (40bars)	5,3 Nm^3 (for 0,5L bottle)	1,9 Nm^3 (for 0,5L bottle)	3,0 Nm^3 (for 0,5L bottle)	3,7 Nm^3 (for 0,5L bottle)	10,5 Nm^3 (for 0,5L bottle)	6,9 Nm^3 (for 0,5L bottle)	8,40 Nm^3 (for 0,5L bottle)	19,5 Nm^3 (for 0,5L bottle)	22,8 Nm^3 (for 0,5L bottle)	13,8 Nm^3 (for 0,5L bottle)

Optima 10
10 cavities
speed up to **16 000** bph (500ml)

Optima 2
variable number of cavities
bottle capacity **500 –7000** ml

Optima 4 MAX
4 cavities
speed up to **6 000** bph (5L)

Jumbo Family

	JUMBO-5	JUMBO-20	JUMBO-J (JARS)
Blowing pressure	25 bar – stable ±2 bar	25 bar – stable ±2 bar	25 bar – stable ±2 bar
Working pressure	10 bar – stable. ±5 bar	10 bar – stable ±5 bar	10 bar – stable ±5 bar
Bottle size	0,25 – 6,0 L	10,0 – 20,0 L	0,25 – 6,0 L (63–120mm)
Bottle domensions	D_{max} – 170mm	D_{max} – 250mm	D_{max} – 170mm
	H_{max} – 350mm	H_{max} – 555mm	H_{max} – 350mm
Output*	5,0L – do 600 bph	20,0L – do 50 bph	5,0L – do 150 jph
Power installed	55kW (nom.), max 97kW	55kW (nom.), max 97kW	30kW (nom.), max 65kW
Quantity of cavities	2	1	2
Moulds material	FORTAL	FORTAL	FORTAL
Pneumatics	FESTO + NORGREN	FESTO + NORGREN	FESTO + NORGREN
Controller	PLC Misubishi	PLC Misubishi	PLC Misubishi
Control panel	HMI Mitsubishi	HMI Mitsubishi	HMI Mitsubishi

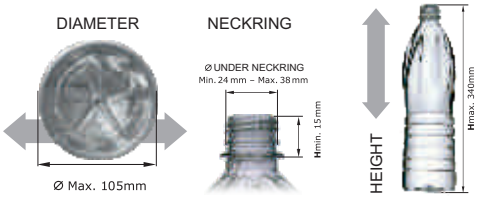
* depends on bottle shape

SEMI-AUTOMATIC BLOW MOULDING MACHINES

JUMBO is a series of semi-automatic machines designed for industrial production of medium size and large PET packages. 0.25 and 6.0 litters bottles can be blown as well as ONE-WAY USE or MULTIPLE-WAY USE 5 GALLON BOTTLES. JUMBO machinę can also manufacture WIDE-MOUTH JARS with the neck diameter up to 120mm. The machines are easy to operate and service. Robust construction of closing unit, easy regulation and efficient nozzle clamping system ensures production of bottles at highest technological level. Machines are manufactured with the usage of top brands components supplied by companies, which guarantee service around the world: TOSHIBA, MITSUBISHI, FESTO, NORGREN. JUMBO machines fulfill all the European standards.

HS Family

HS is serie of linear blowing machines suitable for production of PET bottles 200 ml – 3 000 ml. Thanks to reliable construction, easy operation and maintenance **HS** machines are working all around the world.



	HS 3000	HS 6000
Blowing pressure	25 bar	25 bar
Bottle size	0,20L – 3,0L	0,20L – 3,0L
Output (1,0L bottle)*	do 2500 bph	do 5000 bph
Output (1,5L bottle)*	do 2400 bph	do 4800 bph
Power installed	36,0 kW	72,0 kW
Working air quantity (10bar)**	1,3 m^3/min	2,6 m^3/min
Blowing air quantity (25bar)**	2,2 m^3/min	4,4 m^3/min
Number of cavities	2	4
Steering voltage	24 V / DC	24 V / DC
Mould material	FORTAL	FORTAL

- Compact size and durability of the equipment
- Flexible and efficient – heating system with heating modules – each of them consisted of 7 heating zones (adjusted from machine's touchscreen) ensures proper heating up even long preforms – full control of materials distribution during blowing process
- Easy& flexible in operation – easy mould change-over system and possibility to work with many types of neck rings
- Advanced PLC with build-in memory to keep blowing parameters for many types of bottles
- Stable production with high perforce per cavity – short decompression time
- Reliable machines ensuring cost-saving production
- Modular construction – modules can be combined together with one frame – each module can work integrated to get maximal machine's efficiency or can be switched off to adjust

Stratos Family

STRATOS 10E and 20E electric machines are fully automatic blowers for 3.0L – 20.0L bottle productions.

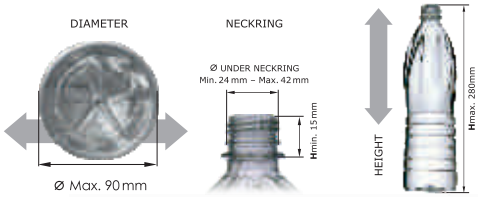
	STRATOS-10e	STRATOS-20e
Blowing pressure	25 – 35 bar	25 – 40 bar
Bottle size	3,0 – 12,0 L	3,0 – 20,0 L
Maks. średnica	220 mm	320 mm
Maks. wysokość	435 mm	550 mm
Maks. kołnierz	48mm	55mm
Wydajność*	2000 but./godz.(3–5L)	500 but./godz. (5 US gal)
Wydajność*	1300 but./godz.(10 L)	700 but./godz. (5,0 L)
Zużycie powietrza (10bar)**	8 m^3/godz.	7 m^3/godz.
Zużycie powietrza (35bar)**	478 m^3/godz. (5L)	691 m^3/godz. (5L)
Zużycie powietrza (35bar)**	591 m^3/godz. (10L)	
Ilość gniazd	2	1
Moc zainstalowana	105 kW	155 kW
Zasilanie	400 V ±5% 3P, 50-60Hz	400 V ±5% 3P, 50-60Hz
Materiał matrycy	Aluminium 7075	Aluminium 7075
Pneumatyka	FESTO	FESTO
Serwomotory	Mitsubishi	Mitsubishi

* depends on bottle design ** 1 L bottle

- Reliable & easy in operation – mould change- over system with rollers, central lubrication system, air recuperation – lower air consumption
- Discharging ready bottles from Stratos directly on conveyor
- Precise & high quality productions – stretching bars with servomotors provides fluent regulation of blowing process
- Compact size & user-friendly PLC control system with option to connect with internet and on-line support
- Powerful heating unit with precise controller

HL and **CL Family**

	HL3000
Blowing pressure	25 bar
Bottle size	0.25 up to 1.5 L
Output 1.5 L	up to **1900** bph
Number of cavities	2
Power installed	36.0 kW
Steering voltage	24V/DC
Mould material	FORTAL



HL 3000 and **CL 200 / 400** are fully automatic linear PET blowing machines suitable for production of bottles 200 ml – 2000 ml.

Machines have very compact footprint and can be easily fit in very limited space. Ready bottles are discharged in upright position and can be easily connected with air conveyor. Low air and energy consumption makes **HL** and **CL** suitable for cost effective production of various shapes of PET bottles.

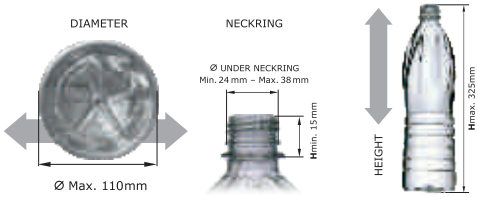
CL machines are equipped with classic heating system (as combi series) and one pneumatic cylinder responsible for work of the closing unit.

HL closing unit is moved by servomotor and equipped with compensation system. Central lubrication system installed in **HL** machines allows easy, fast and precise application of lubricant. Preform transport system based on specially designed pins (as in HS series) allows stable work of machine with oil and chemical preforms.

KEY BENEFITS

- Bottles discharged in upright position – no devices for bottle orientation needed
- Compact size – space saving solution
- Simple construction, easy operation and maintenance
- Easy change-over of bottle size and types of neckrings
- High bottle quality with air blowing pressure only 25 bars – energy saving solution

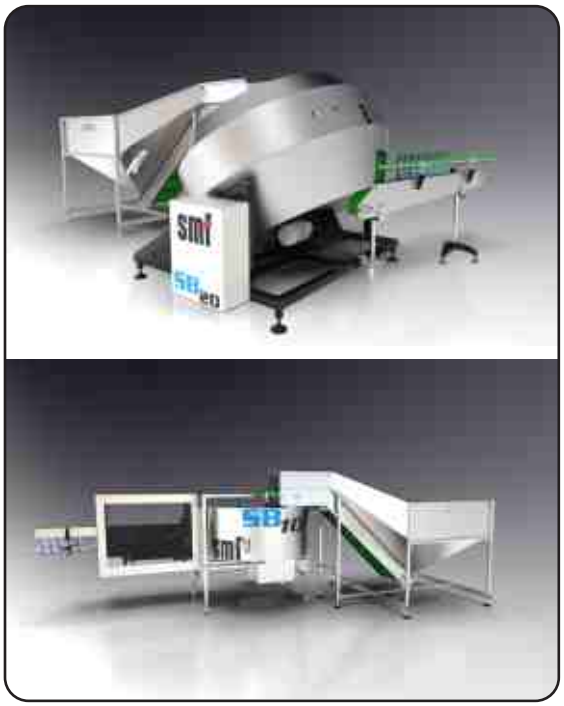
	CL 200	CL 400
Blowing pressure	25 bar	25 bar
Bottle size	0.25 L – 2.5 L	0.25 L – 2.5 L
Output* 1.5 L	up to **1700** bph	up to **3400** bph
Number of cavities	2	4
Power installed	35.0 kW	70.0 kW
Working air quantity (10 bar)	1.0 m^3/min	2.0 m^3/min
Blowing air quantity (25 bar)	1.73 m^3/min	3.46 m^3/min
Steering voltage	24V/DC	24V/DC
Mould material	FORTAL	FORTAL



SB bottle unscramblers

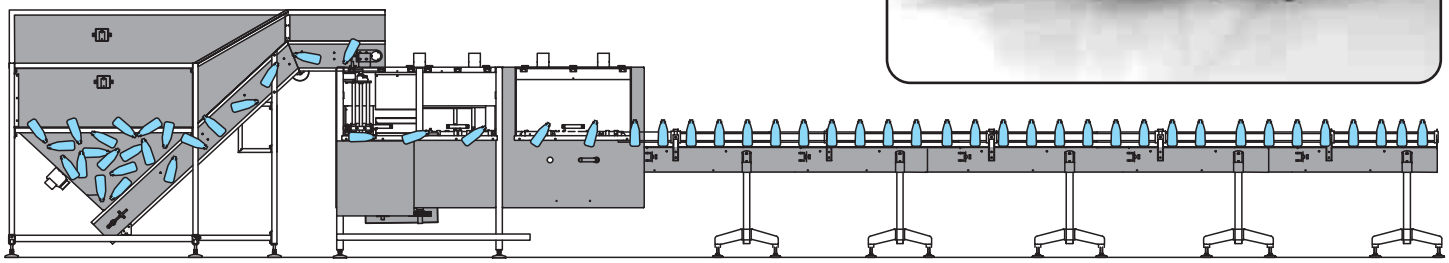
SB bottle unscrambler is used to provide bottles in upright position to transfer them directly to filling line. Disordered bottles are loaded into bottle hopper and unscrambler puts them into vertical position and moves them on the vacuum/ plate or air conveyor. SMF offers liner "belt type" unscramblers (**SB6** and **SB10**) as well as "pocket type" rotary unscrambler **SB20** most suitable for very light bottles.

	SB-6	SB-10	SB-20
Power installed	1.5KW	2.5KW	~6.5 kW
Air requirement	O.5 m^3/h	O.5 m^3/h	~54 m^3/h
Max. working pressure	O.1 – O.4MPa	O.1 – O.4MPa	6 BAR
Power supply	4OOV – 3 PH 5O/6O Hz	4OOV – 3 PH 5O/6O Hz	4OOV – 3 PH 5O/6O Hz
Steering voltage	Mitsubishi (24 V/DC)	Mitsubishi (24 V/DC)	Mitsubishi (24 V/DC)
Dimensions SB (L×W×H)mm	168O × 239O × 153O	21OO × 297O × 153O	2475 × 213O × 2O9O
Output *(depends on a bottle design)*			
Bottles 0.25 – 0.5L	12 OOO BPH	14 OOO BPH	12 OOO BPH
Bottles 1.0 L	9 OOO BPH	1O OOO BPH	8 OOO BPH
Bottles 2.0L	—	6 OOO BPH	8 OOO BPH



KEY ADVANTAGES OF SB SERIES:

- Suitable for PET bottles or other type of plastics
- Versatility in running many bottle formats and sizes on same machine – suitable for cylinders, jars, ovals, squares, rectangles, trigger sprays and other oddly shaped bottles
- Cost-saving solution – automation of production process
- Hygienic process – bottles do not have contact with operators, all bottle contact part made in stainless steel and plastic
- Operational simplicity – no specialized personnel needed & fast and easy format change



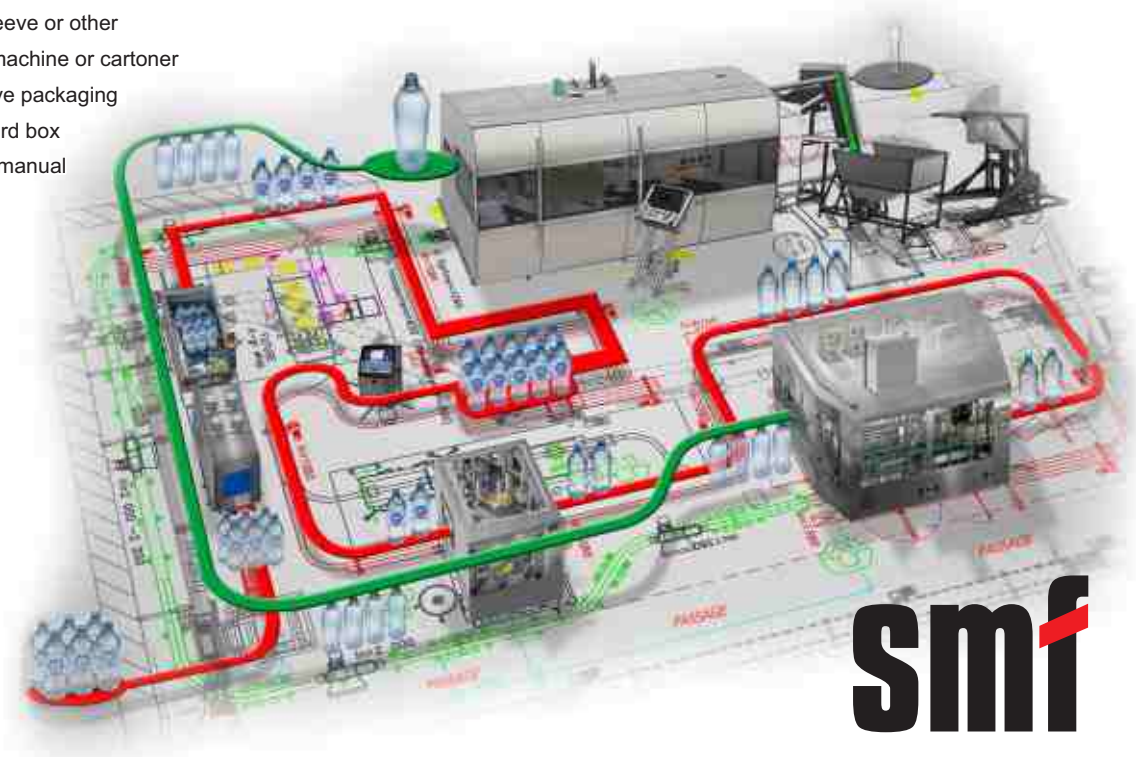
Complete filling line

SMF GmbH company designs, supplies and launches complete lines for filling PET bottles. We offer a comprehensive solution for producers of water, carbonated drinks, milk, juices and producers of household chemicals.

A typical filling line includes the following machines and devices:

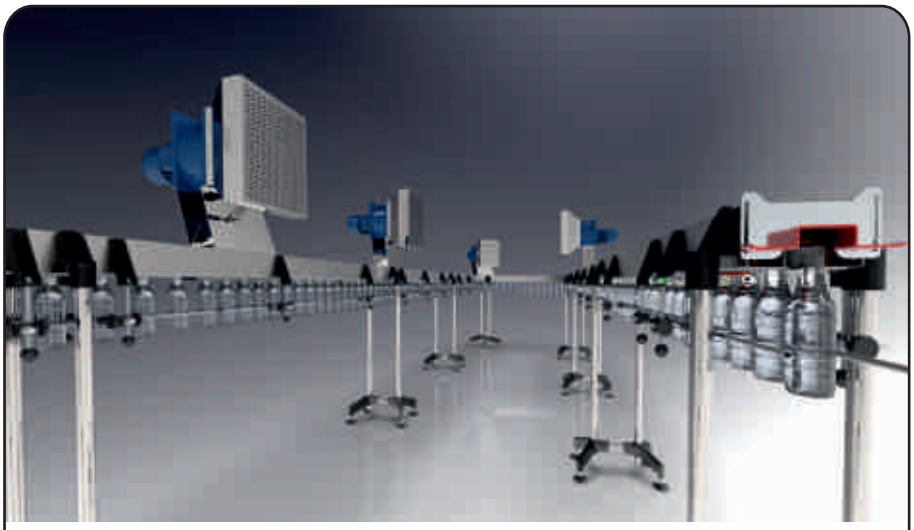
1. **BLOWING** – OPTIMA (or other PET bottle blowing machine)
2. **FILLER** – Filling machine with cap (or TRIBLOCK: Bottle washer + Filling machine + Capping machine)
3. **LABELING MACHINE** – OPP, sleeve or other
4. **PACKING MACHINE** – welding machine or cartoner enabling the creation of a collective packaging in the form of a pack or a cardboard box
5. **PALLETIZATION** – automatic or manual

All devices in the line are connected by a system of different types of conveyors. The configuration, type and length of these conveyors are designed according to the line capacity and the available space where the production will be located.



Conveyors

The air conveyor (pneumatic conveyor) is used to transport empty bottles between machines working on one filling line as well as to buffer the bottles enabling automatic operation of the line. Most often they are used to transport an empty PET bottle from the blowing machine to the filling machine (filler). Conveyors offered by SMF are built of easy-to-assemble modules. The number and type of modules (straight sections, bends, inclines, slopes) is tailored to the individual requirements project. The entire conveyor system is connected into one unit, which is operated by a control box (electric box). This system is also equipped with the sensors that enable the exchange of signals between machines in the line and the coordination of the work. In a situation where there is a need for the higher level of the hygiene, it is possible to make the air conveyor as ultra clean version.



The plate conveyors (single and multi-row) are used for horizontal transport of full bottles (or other containers), packs (cartons, boxes) and other products of repeatable dimensions and weight. Plate conveyors can be used for feeding, receiving and buffering various types of packaging. The conveyor allows you to connect the machines working on the production line, enabling its automatization.

Plate conveyors can also be used to transport empty bottles – in this situation, a vacuum plate conveyor is used, which enables safe transport of an empty bottle.

The plate conveyor can have a single or multi-row structure. Multi-row plate conveyors, allow to buffer the product on the production line so it is possible to reduce the distance between machines in the line and their smooth operation.

About SMF

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