



TECHNOLOGIES

Advanced heat management for large preform reheat





Company profile

HQ Austria

Founded 1999

Employees 240

Design offices 3

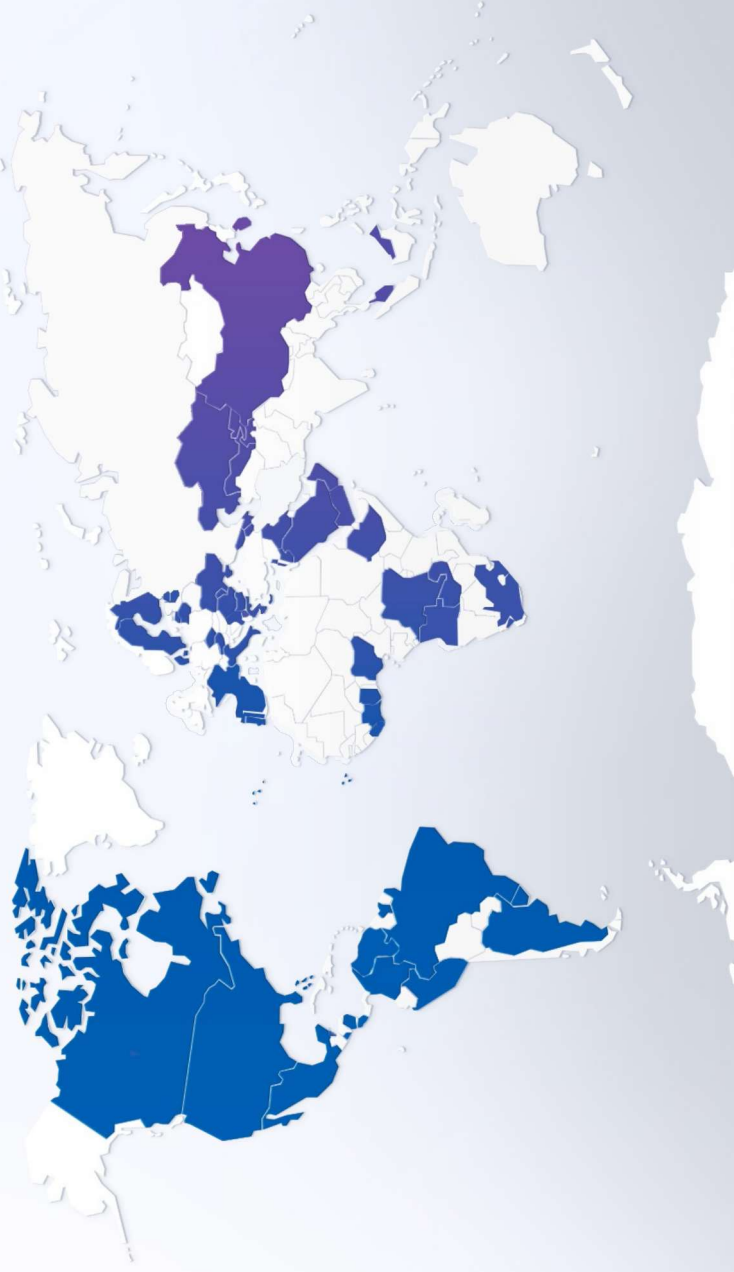
Patents 30

Production cycle Full

Machines made 1200+

Molds made 30 000+

65+ countries



Customer intimacy business model

Flexibility

- ❑ Long-term partnership with each customer
- ❑ Complete solutions
- ❑ Customization of technology

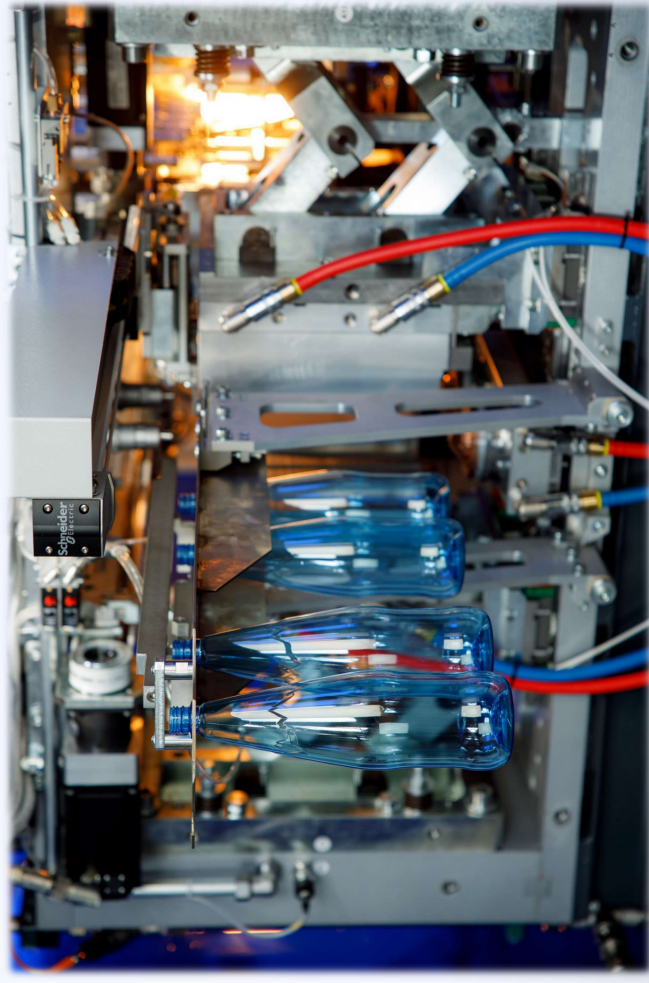


Key points

- ❑ What is large preform & bottle
- ❑ Pillars of heat management
- ❑ Field results

"Large preform"

- high resin mass
- wall thickness >5.5 mm
- stringent thermal-mechanical processing windows



Large preform $\neq$ Large bottle

Large Volume

Preforms for 3-20 L containers

Weight: 80-750 g

Thread finish up to 57 mm

Heavy Mass

Preforms for 0,1-2 L containers

Weight: 30-135 g

Thread finish up to 38 mm

3 core categories

7

1

Large bulk
3-20 L

2

RefPET
0,5-3 L

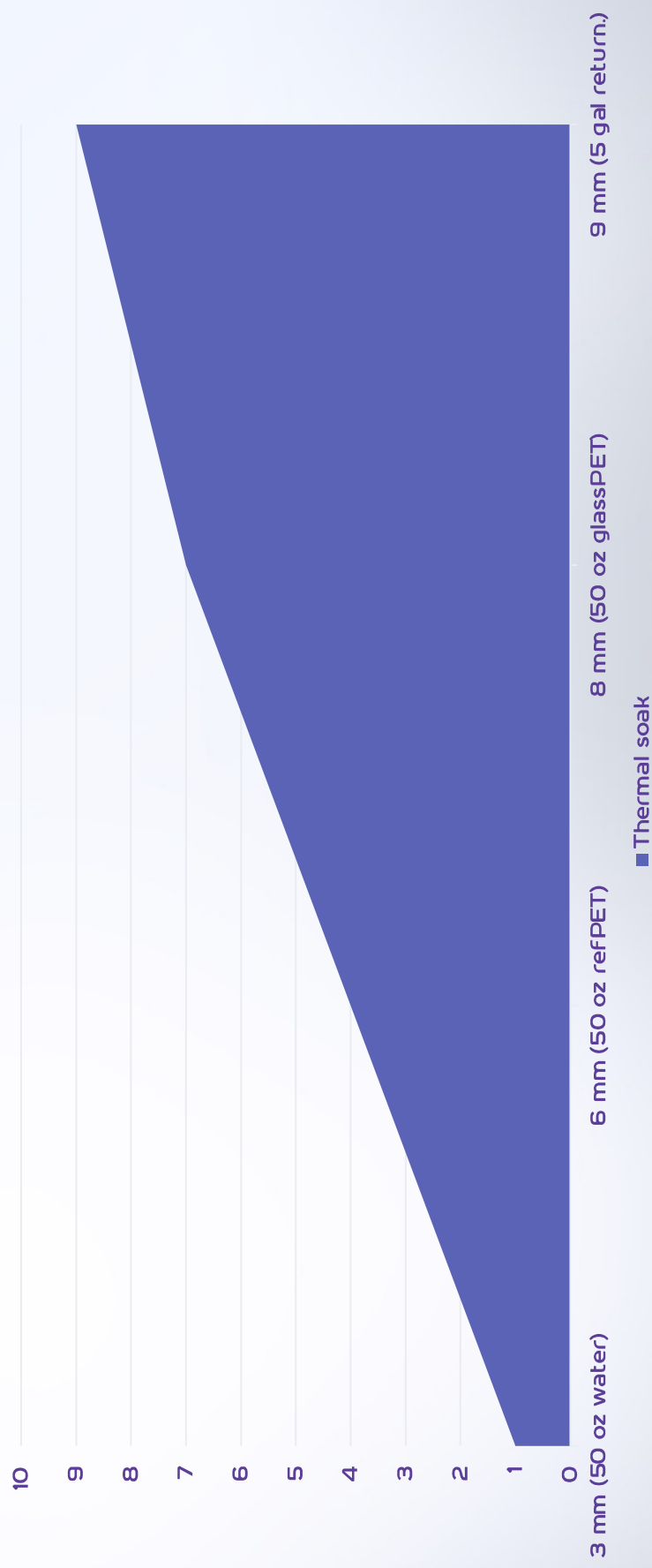
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GlassPET & Spirits
0,1-2 L

Relation of preform weight & wall thickness

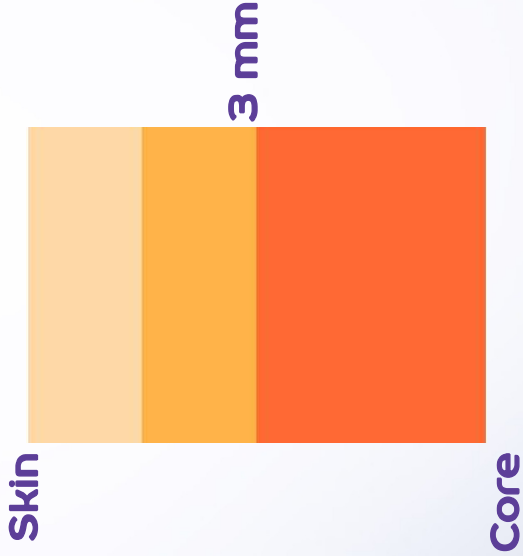


Fourier Soak Law



The core challenge !!!!!!!

Standard beverage preform



Near-uniform temperature distribution

Thick-walled preform

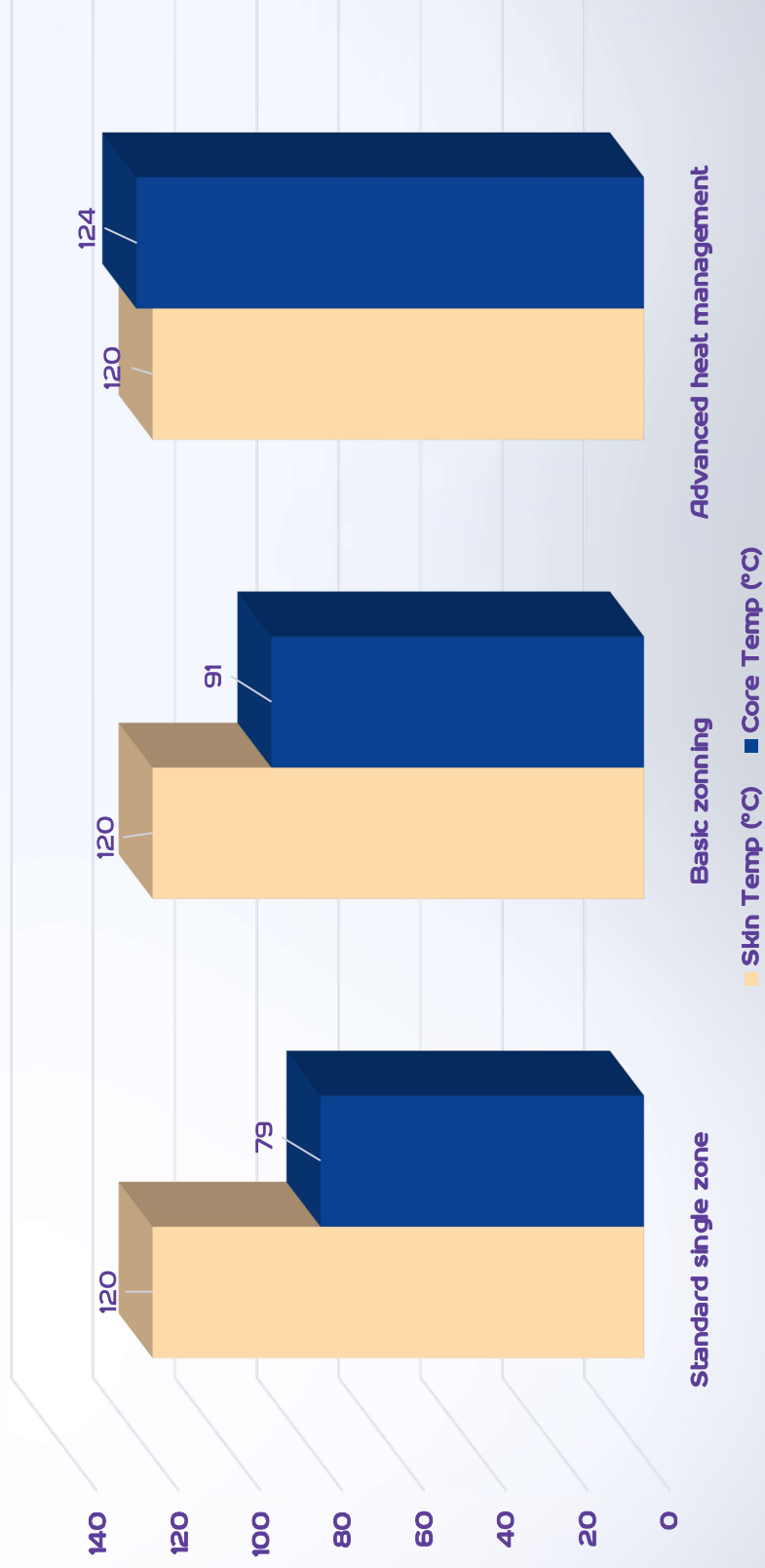


Skin can exceed 100°C while core stays under ~80°C.



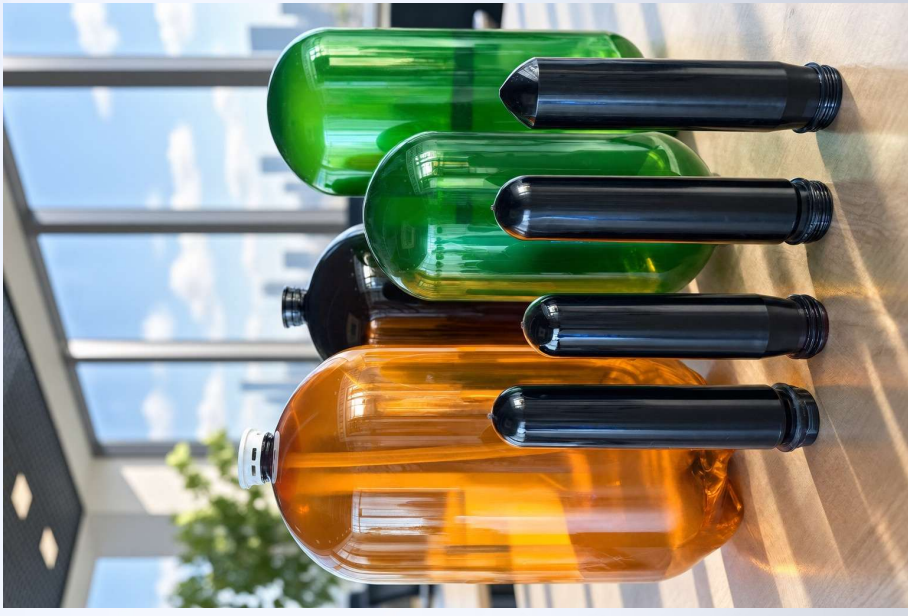
Near-uniform temperature distribution

Skin & Core Temperature by reheat technology



P E T TECHNOLOGIES **Thick-walled containers**

12



5 Pillars of Advanced Heat Management

1

**Multi-zone
lamp
architecture**

2

**Lamp
technology**

3

**Oven
configuration**

4

**Rotation
control**

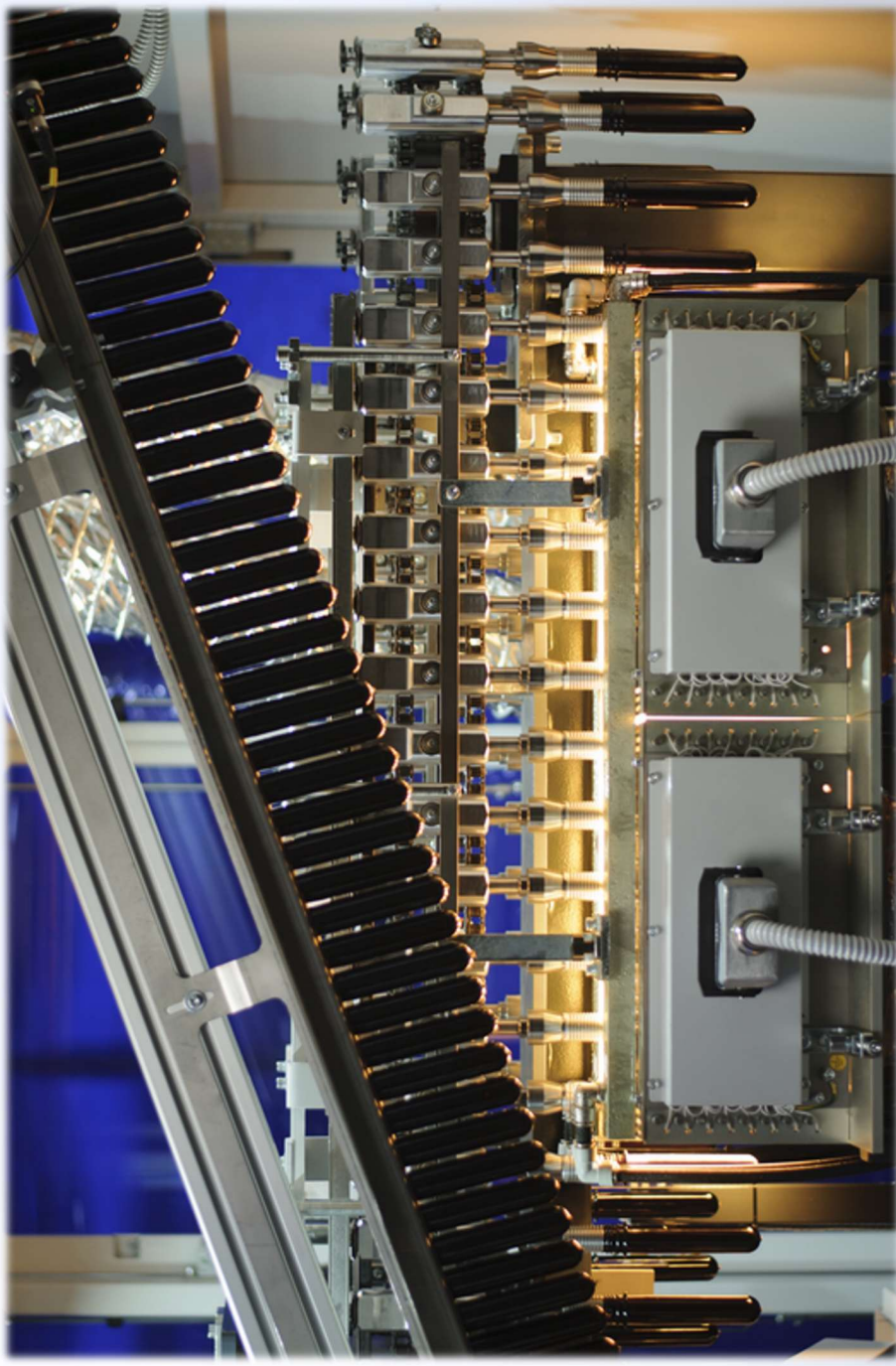
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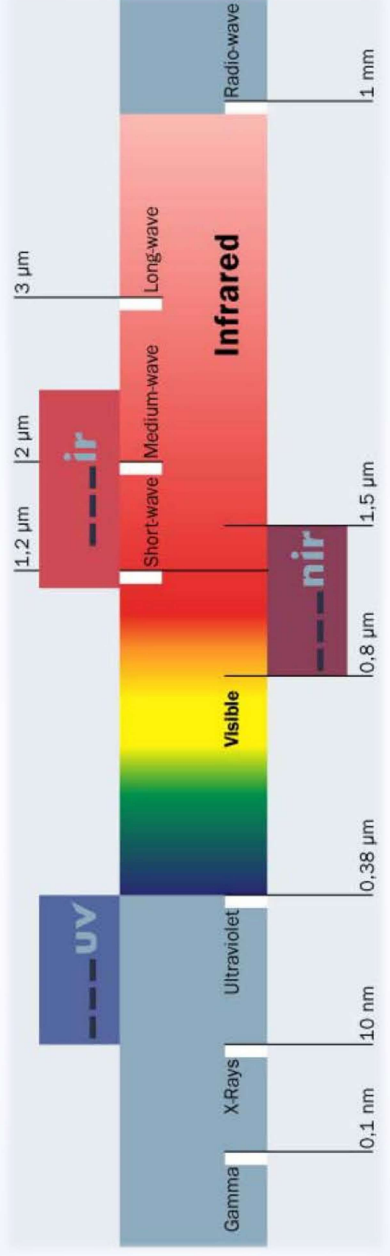
Soak control

From 2 to 8 heating modules depending on the blower model

Each heating module contains from 7 to 11 NIR lamps from Dr. Fischer (Germany)

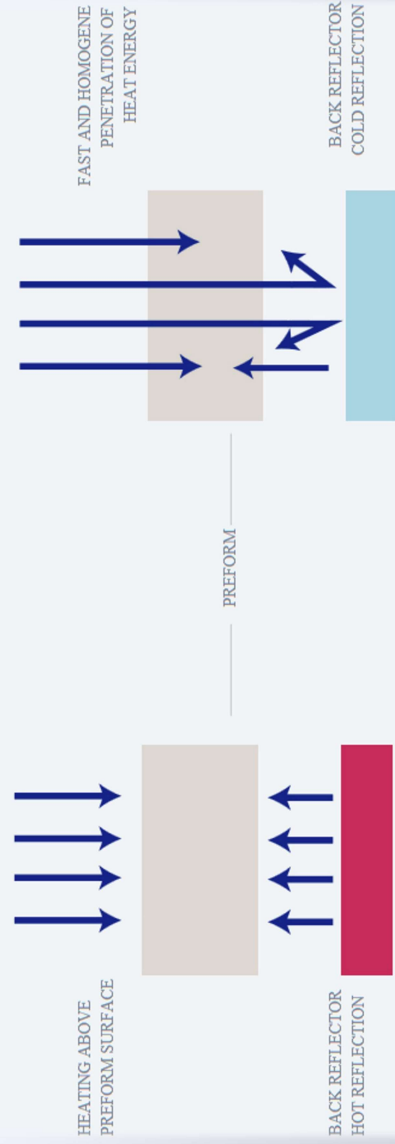
Modules are equipped with temperature control sensors





IR RADIATION (> 1,5 µm)
conventional heating

NIR RADIATION



Conventional IR lamps emit a broad radiation spectrum, much of which is not effectively utilized for heating PET. NIR technology focuses the emitted energy in the wavelength range best suited for PET absorption, providing deeper and more efficient preform heating while reducing energy losses:

- shorter heating cycle
- uniform through-wall heating of PET preforms
- lower energy consumption than conventional IR lamp systems

Heating modules are separated in two groups:

- preliminary heating
- final heating

Both groups can be regulated separately - more flexibility with heating recepies and less energy consumption

[illegible]

Заданная температура
Секций нагрева
Преформы
Скорость потока воды

55 °C	57,0	57,0	57,0	57,0
98 °C	57,0	57,0	57,0	57,0
395 л/мин	57,0	57,0	57,0	57,0

20% нагрева

Преформы 105,0 °C

14000 бул Нас

Впуск за смену 35496 бул/с

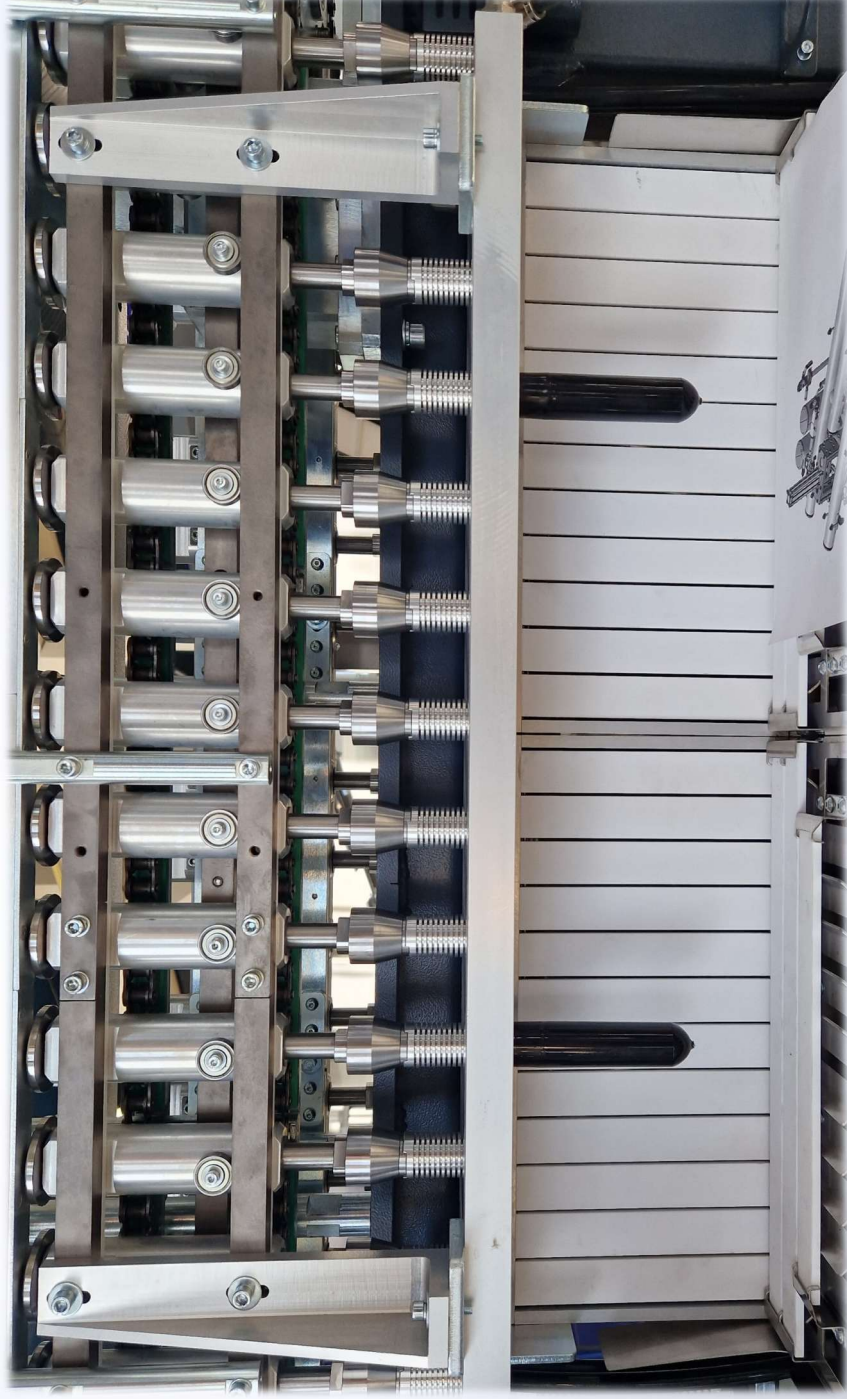
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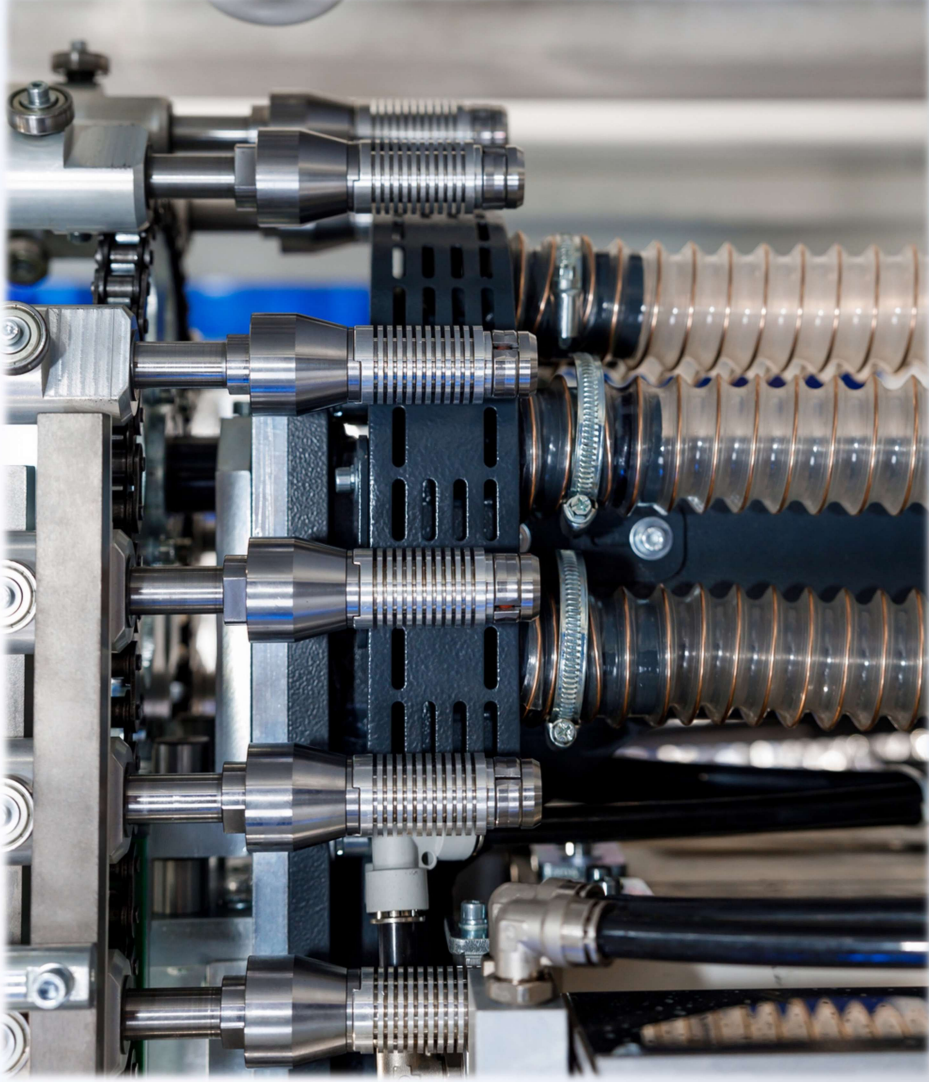
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РЕТ

ТЕХНОМАШ



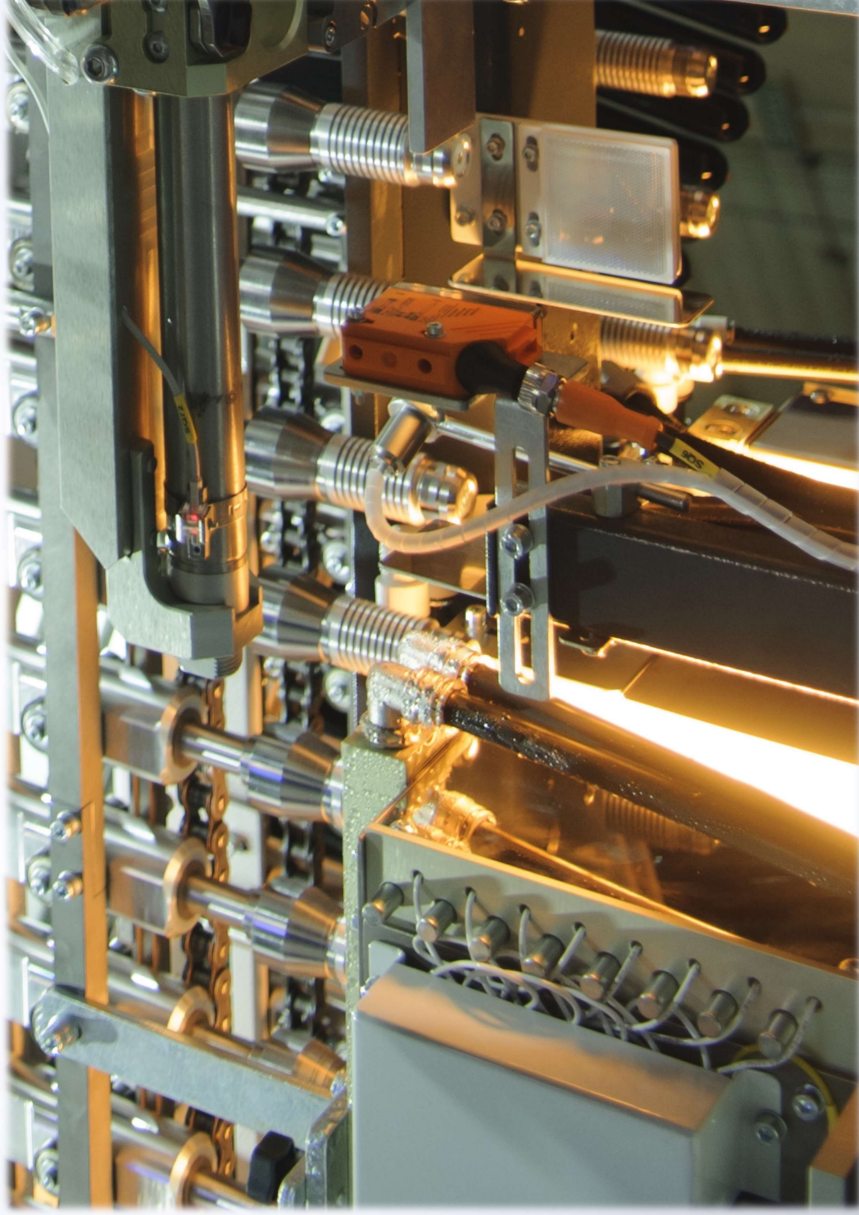
Oven tunnel is covered with ceramic reflectors which significantly reduce energy consumption by 20-22 % compared to conventional heaters



Overheating prevention of the preform neck is provided by:

- cooling liquid circulation through the coolers of the heating units
- guard shields

Additionally mandrels are cooled down by the air on U-turn of the oven that prevents preform neck finish from over overheating



A pyrometer installed at the oven exit continuously monitors preform temperature. If any deviation from the target value is detected, the system automatically adjusts the heating power to maintain optimal processing conditions.

Benefits:

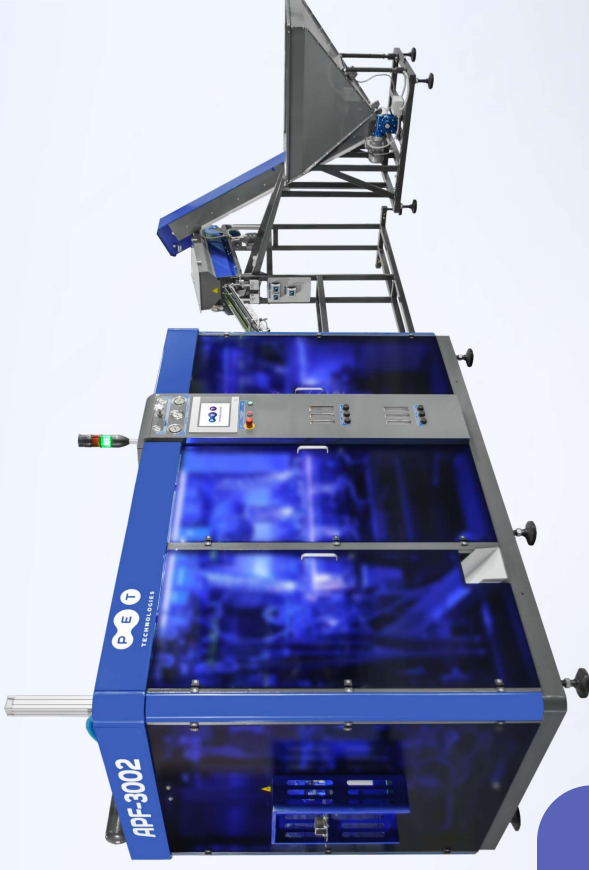
- consistent, high-quality bottle production
- optimized energy consumption
- prevention of overheated or underheated preforms entering the blow mold

Case Study: NIR & IR lamps



APF-Max 2

NIR
0,1 - 2 L
3 400 bph
2 cavity
L: 5,3 m

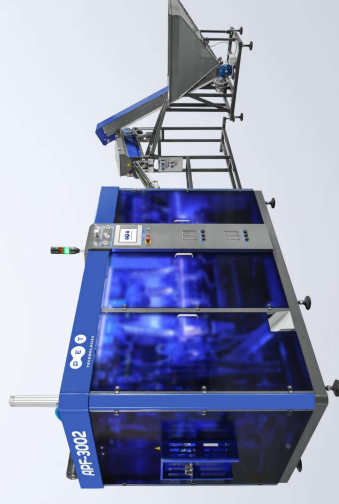


APF-3002

IR
0,1 - 2 L
3 000 bph
2 cavity
L: 7,8 m

Power & production benchmark

Parameter	APF-3002	APF-Max 2	
Output	3000	3400	+12%
Energy consumption, kW	33	25	-24%
Heating modules	4	2	-50%
Length	7,8	5,3	-32%





Tetiana Pronikova

Head of Marketing



Thank you!

ELEMENT
OF SUCCESS

pet-eu.com