



Theoretical production
Average density
Maxi density
Average yarn speed
Maxi yarn speed
Average heat-setting time

5 to 9 T/day & up to 12T & more
400 g/m
450 g/m
500 m/min
600 m/min
55"

Yarn count (dTex)	Theoretical daily production in metric Tons (can be more w. lower dwell time)				Energy consumption						
	1x1500	1x 2000	1x 3000	1x 4000	Steam (Kgs/h) (***)	Air (Nm3/h)	Water (m3/h) (*)	Equivalent KW/h to chill water	Electricity (**)		
									Effective (KW/h)	Installed Power (KVA)	
TVP3 48 ends 9m	5	5	5.3	5.3	~ 80	100	2.7 to 3	+ 13	~ 10	32	
TVP3 48 ends 12m	5	6.5	7.1	7.1	~ 90	105	2.7 to 3	+ 14	~ 11	32	
TVP3 48 ends 15m	5	6.5	8.9	8.9	~ 100	110	ø	+ 15	~ 12	32	
TVP3 60 ends 15m	6.2	8.2	8.9	8.9	~ 100	110	ø	+ 15	~ 12	32	
TVP3 72 ends 15m	7.4	8.9	8.9	8.9	~ 100	110	ø	+ 15	~ 12	32	
HEP/3 option	"				+ 30	-	-	-	~ 2	7.5	
With MF4	"				+ 25	15	-	-	~ 2	9	
With STV/3	"				+ 35	-	-	-	-	-	
With B401 48ends	"				-	0.2 (#)	-	-	~ 16	25	
With B401 60 ends	"				-	0.2 (#)	-	-	~ 20	35	
With B401 72 ends	"				-	0.2 (#)	-	-	~ 24	35	
With MAT3	+ 5 to +15% overall efficiency				-	0.1	-	-	~ 2.5	5.5	
With MCD/3 (72 ends)	Average production 5T/day				+ 30 (DSC3)	150	0.2 (washing)	-	~ 22	35	
Efficiency (%)	Typical 95% - up to 99% with MAT3										

* If water is recycled, consider the equivalent amount of electricity for the chiller / if chilled water is used from the extrusion, then no consumption (cost also depends on cooling water temperature)

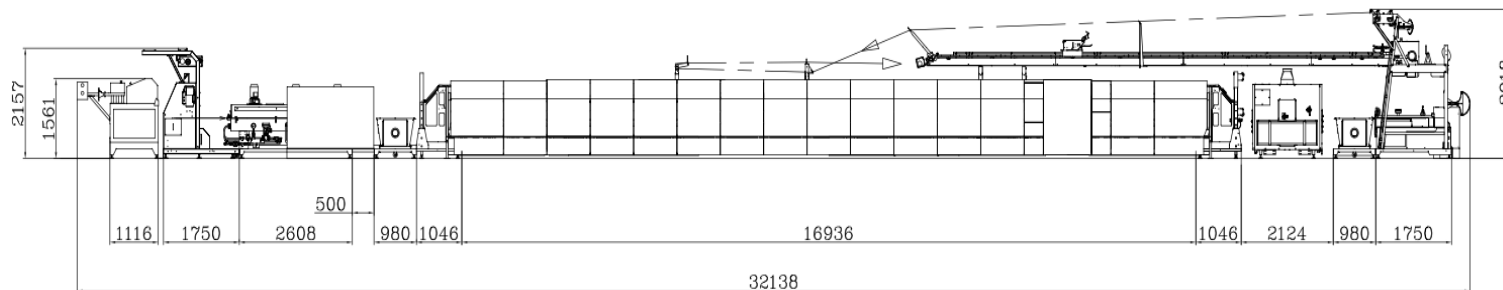
** Installed power is used to define supply cables section and protections (KVA max. power) // Effective power is the average real measured energy consumed by the line in standard conditions and with standard running parameters; it may also vary depending on the yarn type & count, production speed, ...

Effective air consumption 0.2 Nm3/h but needs a reserve of 800liters.

***: Steam consumption is calculated for a standard heat-setting temperature of approximately ~135° C and normal running conditions.

DIMENSIONS:

Minimum layout for a 12m heat-setting chamber TVP3 line (incl. MF4, DAV/3, HEP3, 2x RTV/3, STV/3 & MAT3 on top of the line)



Advanced heat-setting solutions

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VANDEWIELE

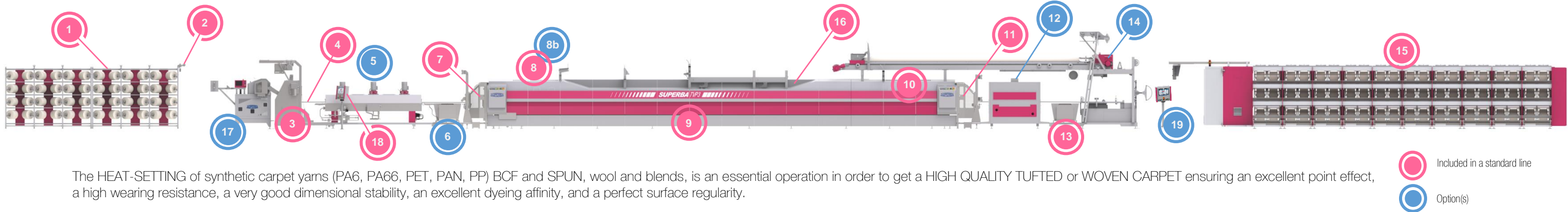


TECHNICAL SHEET



Advanced heat-setting solutions

TVP3 HEAT-SETTING LINE FOR CARPET YARNS, IN CONTINUOUS FLOW, WITH SATURATED STEAM UNDER PRESSURE (up to 145° C)



The HEAT-SETTING of synthetic carpet yarns (PA6, PA66, PET, PAN, PP) BCF and SPUN, wool and blends, is an essential operation in order to get a HIGH QUALITY TUFTED or WOVEN CARPET ensuring an excellent point effect, a high wearing resistance, a very good dimensional stability, an excellent dyeing affinity, and a perfect surface regularity.

RUNNING PRINCIPLE:

The heat-setting line is continuously fed by a creel (1) equipped with both operating and reserve bobbins. An electronic motion detector set up on the feeding creel individually controls each yarn. The yarn bundle formed by 24, 36, 48, 60 or 72 ends passes through the PRE/3 pre-feeder (2) then is laid down without any tension in oval parallel coils by a DAV/3 coiling head (3), on an endless perforated stainless steel conveyor band (4).

Depending on the fibre type, the yarn layer is first treated inside the HEP/3 pre-steamer (5) <option>. At the contact of the dynamic steam under atmospheric pressure (T° about 100 ° C), the fibres freely shrink giving to the yarn its ideal and regular bulk over all the laying. Then, the yarn layer goes through a RTV/3 cooling device (6) <option required only if HEP/3 is used>

The yarn bundle enters the heat-setting tunnel under pressure, composed of two cooling chambers, inlet (8) and outlet (10) and one heat-setting chamber (9) of 9 to 18 meters long. The inlet and outlet tightness of the tunnel is guaranteed by two TEP3 tightening heads (7) and (11) equipped with rollers of special high tenacity rubber. The optimum, constant and regular pressure between the tightening rollers is achieved through pneumatic jacks and PLC controlled, allowing a great flexibility of use. Outlet cooling chamber (10) is equipped with a TCC (turbo cooling), and as an option, inlet chamber can be equipped with this complementary feature (8b) <option>.

In the heat-setting chamber (9), with pure saturated steam under pressure at high temperature (up to 145°C), the yarn undergoes a thermic shock that definitively sets the fibres and yarns crimp, twist and molecular structure. Moreover, the use of pure saturated steam (*without air*) has the advantage of eliminating any risk of fibre oxidation and dehydration, encountered with other treatment fluids. A CBS/3 (16) steam circulation blower system forces the steam passage through the yarn layer to ensure a uniform and homogeneous treatment in the laying.

The heat-setting temperature can be programmed with an accuracy of $\pm 0.3^{\circ}\text{C}$ (*in steady state*), up to 145°C depending on the yarn quality and type.

(For information only: PA6 = 120/128° C & 45/60 sec; PA66 = 132/135°C & 45/60 sec; PES = 140/145°C & 55/65 sec; PP = 125/135°C & 45/55 sec; WOOL = 110/120°C & 70/90 sec)

The heat-setting time can be adjusted by means of the conveyor band speed for each type of yarn in order to get the optimum quality.

A powerful computerized central unit with a large colour touch screen display (18) automates and controls the running of the TVP/3 line. All the treatment parameters are centralized and memorized. An unlimited number of process recipes are available, ensuring absolute treatment reproducibility with no human interference. It controls the output, supervises the running of all the elements on the line and takes action whenever needed. Advanced functions such as history files, downtime reports, efficiency forecast calculation or maintenance manager are included ensuring traceability for a maximal quality; for a higher level of control. The system can be connected to PLANT-TRACK, our supervision software, and a second command panel (19) <option> can be installed at line outlet, close to the winder (15) for an easier control of the whole line.

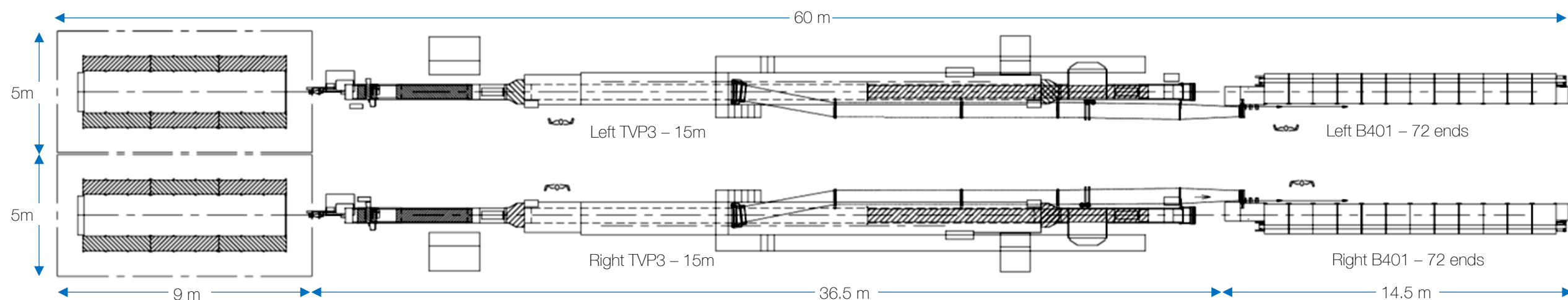
If necessary, the heat-setting yarn layer goes through a STV/3 dryer (12) <option>, and a RTV/3 cooling device (13) before being taken up and stocked in a MAT/3 yarn accumulator to increase efficiency (14) <option>. The yarns are separated, and then wound around conical or cylindrical bobbins on a B401 automatic doffing winder (15). The accumulator is used as a buffer between the heat-setting line and the winder, thus avoiding the line stoppage due to yarn breaks or during the doffing on the winder.

COMPLEMENTARY ACCESSORIES <options>:

- MF/4 friezing machine (17) : production at a reduced cost of frieze or textured yarns combined with the heat-setting operation,
- MCD/3 Dyeing machine (up to 72 yarns): creation of fancy yarns, space-dyed yarns with long, short spots or solid colour ... combined with the heat-setting operation.

LAYOUT:

Example: "In-line" configuration 72 ends / 15m-heatsetting tunnel TVP3 with face-to-face creel [with HEP3, 2 x RTV/3, STV/3] and B401 winder / the line is fully reversible (right or left side)



Other layouts are possible, like <winder and creel "on the side"> to reduce the overall occupied floor space – i.e. for a 9m tunnel – 25,6m x 4,3m = 110m²