new

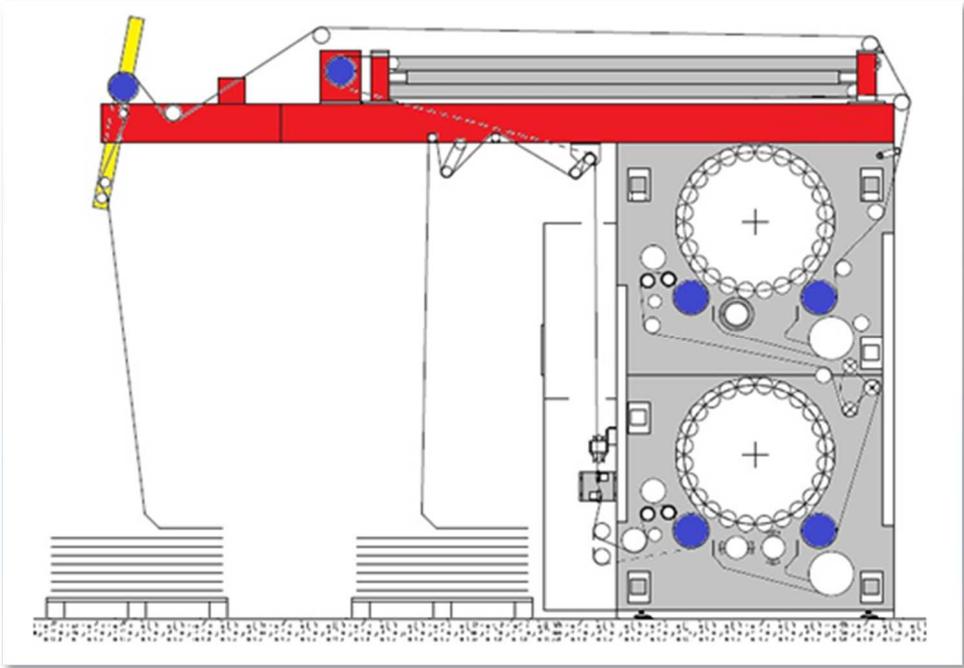# Polaris-24

LAYOUT

REINFORCED STRENGTH STEEL FLANGES

All the round flanges have been reengineered with a new 38 mm thickness design, which continues to grant an important reduction in the vibrations caused by the process, while still being very solid and sturdy.

They have been upgraded to 800 mm diameter, in order to increase the contact with the fabric, thus the duel time in working conditions.
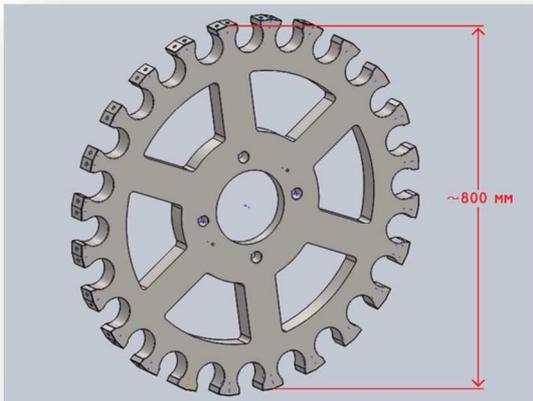
The insertion of the cylinders and the bushes is made particularly easier, both for the assembly and the dismounting when necessary.
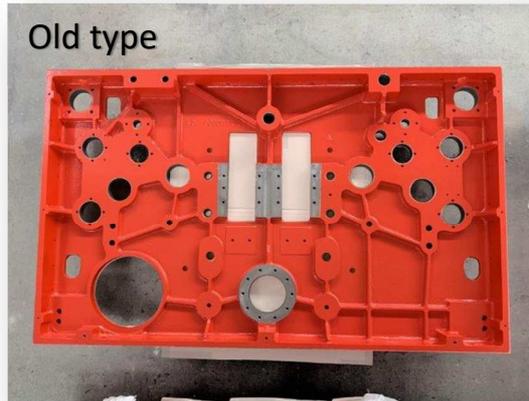
The result is a machine that can last for almost a life.

REINFORCED STRENGTH STEEL SIDE SHOULDERS

The side shoulders are made of reinforced strength carbon steel, to lower the total weight of the machine, but at the same time, granting solidity and mechanical resistance to vibrations, due to special designed ribs.

Old type

New type

INTERNAL DANCING ROLLER

It has been lightened and modified in order to be more efficient and resist to the possible shocks given by the fabric under tension.

DRAFT CYLINDERS

Draft rollers have been increased in diameter, made of reinforced strength carbon steel and wrapped with top-notch grip silicone tape, to assure excellent traction grade, avoiding sliding.

BOTTOM RAISING DRUM

The bottom drum is configured in Pile/Counterpile System with 24 raising rollers, which is the most effective way to process both Cotton fibers and Synthetic fibers (such as Polyester, CVC, T/C, Elastane blends).
Flanges' diameter is almost 800, allowing the drum to run faster and efficiently.
Rollers' diameter has been increased to 70 mm, with 13.3 mm gauge between rollers, to increase the fabric surface in direct contact with the raising fillet, giving the proper attack angle to the needle.

UPPER FLEECING DRUM

The upper drum is configured in "Fleece" System, equipped with 24 raising cylinders with felt base needles in 3:1 configuration; all the raising cylinders are oriented in one single direction, opposite to the fabric: ¾ of the cylinders are needle, ¼ are mushroom head.
Flanges' diameter is 800. Rollers' diameter is 70 mm, with 13,3 mm gauge between rollers, in order to give a full and complete fleecing coverage.

ETC° (Electronic Torque Control)

The tension control, through torque feedback, allows the reading of motor load absorption thanks to the inverter signals, through an amperometric transformer. This data is sent to the PLC, which reacts back onto the motor itself to change its speed to the desired one.
This is a fine tuning of motor speeds, based on the previously set tension.
Not all the machines of our range of production are equipped with the ETC, but provided under request.
Like all the machine settings, the ETC electronic control setup can be saved in the PLC memory (through the HMI display) and kept in backup on the special mass memory inserted in the CPU.

TRANSMISSION BELTS

The use of high performance v-belts ensures a smooth and continuous transmission of power traction from the motors to the cylinders, in order to guarantee a continuous raising force.

PREVENTIVE MAINTENANCE AND ALARMS

The aim of the preventive maintenance function is to remind the operators some actions of scheduled maintenance according to the working hours of the machine.
When the operator starts the motor line, the PLC will recall the scheduled maintenance page, and alert about the needed maintenance to be done.
The PLC also carries out a constant control of all the sensors and safety devices of the machine.
When a device or an emergency interferes (mushroom buttons, ropes, open guards, lack of compressed air ...) the machine is stopped and placed in Emergency Mode.
The display will show a page, which traces the cause of the emergency.

ESS° (Energy Saving System)

As per Mario Crosta's highest standards of attention to energy consumption, the machine presents the ESS electronic configuration, which allows a huge energy saving percentage.
The machine uses the DC-BUS connection, which converts the energy on first stage and provides Inverters with DC current: this gives a first benefit of saving all the electronic devices from spikes and disturbs, and secondly balances the energy absorption, by diverting the unused energy to other inverters and motors in need.

MARIO CROSTA

SINCE 1925
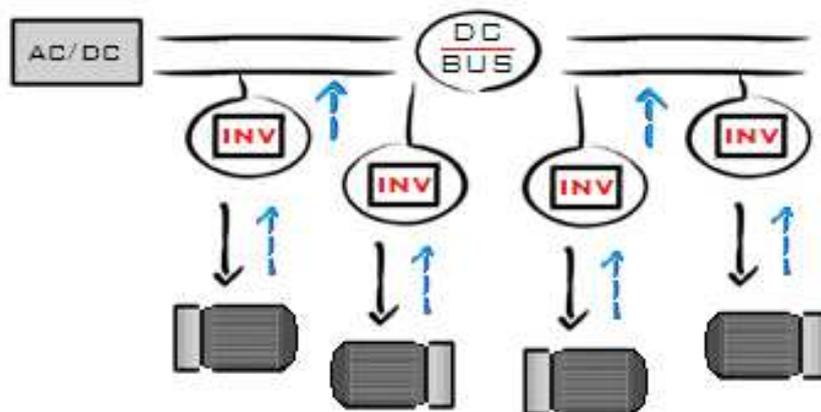
BENEFITS IN NUMBERS

		MC 20/24	new Polaris-24	MC20/28	new Polaris-28	POLARIS ITMA	comp	comp	
	Year of Release	1984	2021	2013	2022	2019	1995	2010	
A	UPPER DRUM : NUMBER OF CYLINDERS	24	24	28	28	28	24	28	
B	Roller width	2250	2250	2250	2250	2350	2200	2200	mm
c1	Roll diameter WITHOUT fillet	65	70	60	70	75	70	70	mm
C	Roll diameter WITH fillet	85	90	80	90	95	90	90	mm
d1	Centerline	736	795	811	900	970	850	980	mm
D	Drum speed recommended for best results	110	110	110	110	140	110	110	RPM
E	Fabric speed	20	24	21,5	30	42	18	27	m/min
F	Length of fabric in contact	837	933	870	1.026	1.083	793	979	mm
G	Fabric to each raising roll contact	44,04	46,63	41,45	46,63	49,22	46,63	46,63	mm
H	Number of active rollers	19	20	21	22	22	17	21	n°
I	Fabric on drum dwell time (seconds)	2,51	2,33	2,43	2,05	1,55	2,64	2,18	sec
L	Drum rotations at each unit of fabric	4,6	4,3	4,5	3,8	3,6	4,8	4,0	n°
M	Total n. of active rollers based on drum rotation	87,44	85,49	93,52	82,75	79,41	82,35	83,78	n°
N	Total fabric to raising contact based on drum	3.851	3.986	3.877	3.859	3.908	3.840	3.907	mm
O	Power absorption upon installed	25-35%	25-35%	25-35%	25-35%	25-35%	55-60%	55-60%	%

F	$(d1+C) \times \pi \times H : A$	π
G	$C \times \pi : A$	3,14
I	$F : E : 1000 \times 60$	
L	$D : 60 \times I$	
M	$H \times L$	
N	$G \times M$	

The scope of such new developed machines (**Polaris-24** and **Polaris-28**) is to increase the productivity of our previous models.

Based on our studies and analysis, the different geometry and dimensions of essential parts of the machines, is giving a huge increase in the total fabric in contact with the rotating cylinders while drums are rotating at proper speeds.

As a consequence, at similar values (N), the speed can be adapted and increased accordingly, keeping the same of even better results in terms of quality and full coverage (E).

MARIO CROSTA
— SINCE 1925 —

BENEFITS IN VALUE

Machine cost (€)		CL-O-2000	VR9000	GRI228	MC 20/24	POLARIS-24
number of machines	n.	2	1	1	1	1
cost per machine	€	50.000	85.000	128.000	115.000	125.000
Amortization time	years	10	10	10	10	10
Cost per Year	€	5.000	8.500	12.800	11.500	12.500
cost per meter / per Kg						
speed	mt/min	**18**	**18**	**27**	**20**	**24**
time per year	days	180	180	180	180	180
hours per day	hours	22	22	22	22	22
efficiency (10-20%)	%	80%	85%	90%	90%	90%
production/year per machine	mt/year	3.421.440	3.635.280	5.773.680	4.276.800	5.132.160
cost per mt	€/mt	**0,0029**	**0,0023**	**0,0022**	**0,0027**	**0,0024**
production/year per machine	kg/year	1.368.576	1.454.112	2.309.472	1.710.720	2.052.864
cost per kg	€/kg	**0,0073**	**0,0058**	**0,0055**	**0,0067**	**0,0061**

Power Cost €/kg						
Machine Installed Power	kW/h	70	65	65	65	65
efficiency (90-80-60%) in consumption	%	90%	90%	90%	60%	60%
Real Power consumption per machine	kW/h	31,5	58,5	58,5	39	39
Suction Installed Power	kW/h	5,5	7	7,5	7,5	7,5
energy cost	€	0,070	0,070	0,070	0,070	0,070
cost per mt	€/mt	**0,0055**	**0,0050**	**0,0032**	**0,0030**	**0,0025**
cost per kg	€/kg	**0,0139**	**0,0125**	**0,0079**	**0,0075**	**0,0063**

> DC-BUS

Labor cost						
monthly salary	€	200	200	200	200	200
working hours in a month	h/month	660	660	660	660	660
n. of employees	n.	2	1	1	1	1
production per hour	mt/h	864	918	1.458	1.080	1.296
cost per mt	€/mt	**0,0007**	**0,0003**	**0,0002**	**0,0003**	**0,0002**
production per hour	kg/h	346	367	583	432	518
cost per kg	€/kg	**0,0018**	**0,0008**	**0,0005**	**0,0007**	**0,0006**

Maintenance						
Brush/grinding change	€	1.500	1.500	1.500	1.500	1.500
for line	€	3.000	1.500	1.500	1.500	1.500
If Change 1 time per year						
cost per mt	€/mt	**0,0009**	**0,0004**	**0,0003**	**0,0004**	**0,0003**
cost per kg	€/kg	**0,0022**	**0,0010**	**0,0006**	**0,0009**	**0,0007**

PRODUCTIVITY	kg	1.368.576	1.454.112	2.309.472	1.710.720	2.052.864
PROCESS COST	€/kg	0,0251	0,0202	0,0151	0,0161	0,0132
SELLING VALUE	€/kg	0,1100	0,1100	0,1100	0,1100	0,1100
MARGIN	€/kg	0,0849	0,0898	0,0949	0,0939	0,0968

Process Cost Splitting

ROI