The future we see through

FORMING DELIVERY

SERVO PLUNGER
SERVO SHEARS
SERVO GOB DISTRIBUTOR X2 X3 X4
DELIVERY CONSTANT ANGLE 30°

BDF® industries

OUR HERITAGE

Since 1906, BDF Industries' principal activity has been the development and integration of complex technologies to aid industrial progress.

The **worldwide market** depends on BDF's multitasking, multicultural, and multi-expertise strategy, which has evolved and shaped itself over the years in response to market demands.

BDF provides the chance to join a top-notch technological group ready to compete with present and future business opportunities in terms of **competitiveness, performances, and reliability of products** and processes thanks to its natural collaborative instinct and the professionalism shown in more than **115 years of tradition**.

The future we see through.

OUR MISSION

Manufacturer of cutting-edge machinery, BDF Industries is a group where innovation and performance converge in a never-ending quest for excellence.

MELTING

For the design and supply of furnaces, working ends, and forehearths, BDF Industries Melting's product portfolio comprises the whole glass melting and conditioning technologies. Additionally, **relevant equipment** including oil and gas burners, firing system air, exhaust reverse valves, batch chargers, and stirrers are part of the product line.

BDF Industries furnaces are engineered with an **high level of customization**, focusing in particular on energy efficiency and environmental impacts. BDF Industries is able to offer a wide range in **design, manufacture, and supply** of different furnace types for production of containers, tableware, lighting ware, and technical glassware due to a long history of experience combined with a team of skilled people who work together in a synergistic way..

FORMING

The glass container Forming product line of BDF Industries is the company's historical primary activity. BDF Industries can supply a wide range of **machines with a high level of production flexibility** to satisfy the needs of its customers.

With more than 65 years of experience in glass forming field, BDF Industries can offer a complete range of IS machine including gob forming and delivery, ware handling, container and variable equipment. The glass forming machineries are **fully designed and assembled** in house at BDF Industries **in Italy**, which has relevant knowledge of production process with the most important glass manufacturers in the world (e.g. strong credentials for forming business in O-I, Saverglass, Sisecam, Vetropack, Vitro...).

SERVICE

BDF Industries has a Service division dedicated to provide a comprehensive range of **high-quality service solutions** to our clients from a single source. From glass melting to forming, filtering, energy facilities, and automation, our services serve the whole product value chain.

The service product line includes installation & startup, upgrades of mechanical equipment and automation, technical assistance for repairing and overhauling, training, performance evaluation & long term service agreement, integrated maintenance management & diagnostic solutions and systems, spare parts.

The contents of service are the following:

- Supply local qualified supervisors
- Supply of certified end/or upgraded OEM (Original Equipment Manufacturer) spare parts for all maintenance operations
- Performance of all equipment maintenance
- Repairs using state-of-the-art technology
- Optimization of Spare Parts inventory
- On the job Training of local maintenance and operation personel.

The BDF Industries Learning Center in Italy, as well as strategically situated Service Centers, provide a comprehensive range of technical training. Our technical courses are taught by field-tested experts who combine theoretical knowledge with practical expertise.

Forming Delivery

Feeder

SERVO PLUNGER
SERVO INDIPENDENT PLUNGER
HEIGHT REGULATION

TECHNICAL FEATURES

- Versatile installation on conventional feeders
- Use of standard plunger chuck
- Use of low inertia brushless motor and digital electronic drive
- Plunger position accuracy < 0,02 mm
- Motion control with electronic cams
- Controlled by integrated or stand-alone system
- Interface with any type of machine electronic control

MECHANICAL FEATURES

- Housing structure in cast iron containing the carriage, the linear guides, and the ball screw in the oil bath
- Ball screw with double preloaded ball-bushings for long-life service
- Low inertia brushless motor
- Long-life synchronous belt transmission

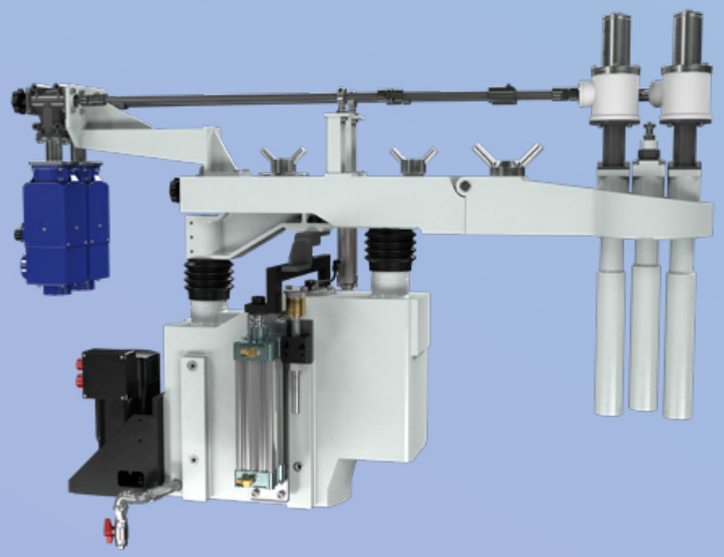
MAIN DATA

- Max. Plunger Stroke 7” (180 mm)
- Min. Plunger Stroke 5 mm

SERVO PLUNGER HIGHT REGOLATION

- Mechanical precision regolation of refractary plunger height
- Small steps programmable starting from 0,01 mm
- Easy maintenance motor’s position

Possibility to work in manual step or in a close loop with weight control system integrated in BDF electronic control Available in DG and TG configuration.



GEAR TYPE REVOLVING
TUBE MECHANISM

MECHANICAL FEATURES

- Height adjusting stroke = 130 mm
- Tube supports size: 5”-6”-7”-8”-10”-12”
- Lifting mechanism with 0,5 mm of positioning stroke per revolution
- Tube rotation speed and direction are controlled with a brushless motor by the machine computer
- Air cooling with fanned or compressed air
- Torque limiting device to prevent damage to the refractory
- Ball bearing or carbon-bearing for the tube support
- Manual or servo-controlled lifting device

FEEDER TYPE	SPOUT	PULL (T/24h)	GOB WEIGHT (gr)				REFRACTORY		
			SG	DG		TG	SPOUT		TUBE
			-	3”	4”⅜	3”	Depth.	Office Ring	Diam.
64	144 Std.	4.5-18	100-2000	10-300	-	-	6”	5”	5-6-7
	144 Deep	18-32	180-2300	50-350	120-350	-	10”	5”-7”	5-6-7
65	81 Std.	18-40	100-2000	-	15-400	10-100	7”¼	7”-8”	7-8-10
	81 Deep	27-68	180-2300	10-300	50-700	50-250	10”	7”-8”	7-8-10
	194 Std.	5-35	100-2000	-	15-400	10-100	7”¼	7”-8”	7-8-10
	194 Deep	15-60	140-2300	-	50-700	50-250	10”	7”-8”	7-8-10
66	115	45-90	180-2800	-	100-1200	50-450	11”5⁄16	7”	7-8-10
	503	30-90	180-2800	-	100-1200	50-450	11”5⁄16	7”÷ 10”	8-10-11-12
	503 Deep	45-90	180-2800	-	100-1200	50-450	13”5⁄16	10”	10-11-12
	515	90-136	180-2800	-	100-1200	50-450	13”	12”	12

Forming Delivery

Cutting Gob

SERVO ARCUATE

MAIN DATA

- Max. Speed 180 cuts/min
- Min. cutting time 330 msec
- Max. Shear opening angle 30° or 40°
- Cut angles 0°÷90° LH and 0°÷30° RH
- With cut angles > 30° RH a symmetrical mechanism can be used
- C.D.: SG-DG 3”- DG 4”3/8
- Integrated or stand-alone system, even on conventional feeders
- Interface with any type of machine

BENEFIT

- No reverse motor rotation at the cutting point
- No mechanical cams:
  Reduced job change downtime
  Easy cam customization
- Constant cutting time at all machine speeds
- Reduced set-up times
- More constant gob weight at high speed
- Presetting cutting cams
- High reliability

FEATURES

- Connecting rod-crank transmission
- Air spring on the no-motorized arm to guarantee constant contact between teeth of the arm gears
- Motor support assembled on a carriage and controlled by a pneumatic cylinder for the mechanism’s emergency stop
- Overlap shear position’s adjustment by motor support’s position control (carriage end-stroke control)
- Opening and emergency positions’ control
- Data programming by operator’s computer or hand-terminal
- Easy and efficient trouble diagnostic

DUAL MOTOR
SERVO ARCUATE

MAIN DATA

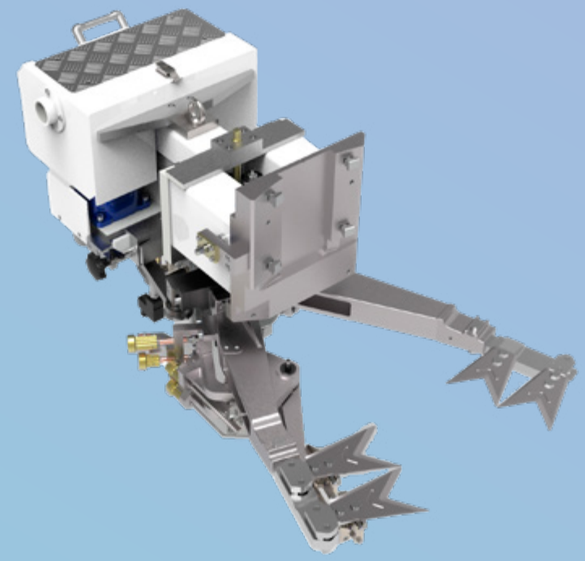
- Max. Speed 240 cut/min (at 13° configuration)
- Max speed 210 cut/min (at 17° configuration)
- Weight of shear approx: 160 kg
- C.D.: SG-DG 3”- DG 4”3/8 - TG 3”
- Integrated or stand-alone system, even on conventional feeders
- Interface with any type of machine

BENEFIT

- Reproducible motion and thus improved constant weight of gobs (max. possible timing error 0.2 ms)
- Motion profles to be selected inside the BDF software
- Production speeds of up to 240 cuts per minute
- Dwell time of the shears improved the cooling shear’s conditions
- Almost maintenance-free operation
- No reverse motor rotation at the cutting point comes benefit

FEATURES

- Each of the shear arms is driven by a separate brushless servo motor
- The tension of the blades can always be adjusted by means of a handwheel, which adjusts the position of a threaded shaft
- The movement of each arm is 17° (Optional Kit 13°)
- Joints of moving parts are equipped with spherical roller bearings, so it’s nearly wear- and backlash-free
- Opening and emergency positions’ control
- Data programming by operator’s computer or hand-terminal
- Easy and effcient trouble diagnostic



SERVO PARALLEL

MAIN DATA

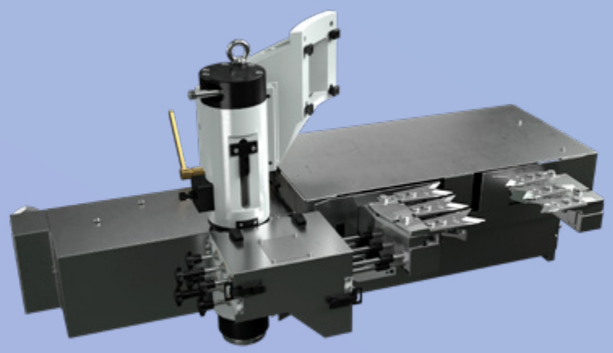
- Max. Shear opening - 280 mm
- Max stroke 82 mm (at min. cutting time)
- Cut angles 0°÷90° LH and 0°÷ 30° RH
- C.D.: SG - DG 3” - DG 4”3/8 - TG 3”
- Integrated or stand-alone system, even on conventional feeder
- Interface with any type of machine

BENEFIT

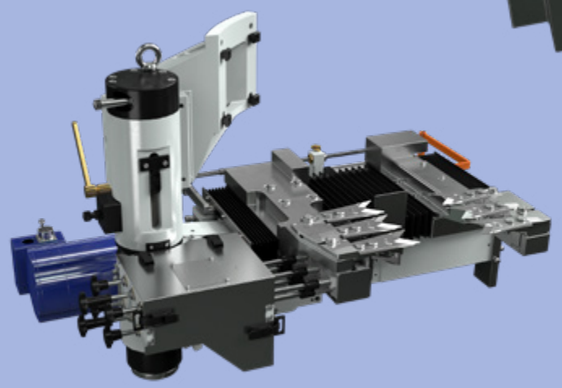
- Parallel shear motion
- Simultaneous cut for each gob
- Modular and independent gob guide system
- Easy maintenance
- Reduce inventory
- Reduced job change downtime
- Constant cutting time at all machine speeds
- Reduced set-up times
- More constant gob weight at high speed
- Presetting cutting cams
- Improved shear blade life

FEATURES

- Outside shear arm bearings to improve the rigidity of the arms
- New modular gob guide for easy change
- Right shear arm with independent gob guide adjustment
- Left shear blade holder arm with adjusting system for blade tension
- Lateral support with magnetic lock for mechanism clamping in the working position
- Safety shear arms opening with pneumatic cylinders
- Shears mechanism support with height adjustment and lateral centring system



Servo Parallel with carter



Servo Parallel without carter

HS
SERVO PARALLEL

MAIN DATA

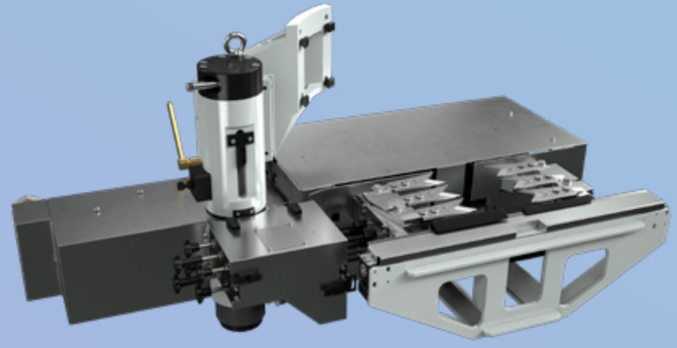
- Max. Shear opening - 280 mm
- Max stroke 82 mm (at min. cutting time)
- Cut angles 0°÷90° LH and 0°÷30° RH
- C.D.: SG - DG 3” - DG 4”3/8 - TG 3”
- Integrated or stand-alone system, even on conventional feeder
- Interface with any type of machine

BENEFIT

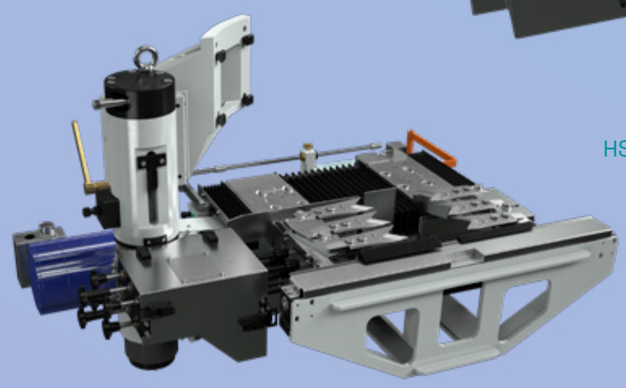
- Simultaneous cut for each gob
- Modular and independent gob guide system
- Easy maintenance
- Reduce inventory
- Reduced job change downtime
- Easy cam customization
- Constant cutting time at all machine speeds
- Reduced set-up times
- More constant gob weight at high speed
- Increased carriage speed
- Presetting cutting cams
- Improved shear blade life

FEATURES

- Precise carriege guide
- Internal triple guide
- Additional external guide shaft to improve arm stability at high speed
- New modular gob guide for easy change
- Right shear arm with independent gob guide adjustment
- Left shear blade holder arm with adjusting system for blade tension
- Lateral support with magnetic lock for mechanism clamping in the working position
- Safety shear arms opening with pneumatic cylinders
- Shears mechanism support with height adjustment and lateral centring system



HS Servo Parallel with carter



HS Servo Parallel without carter

Forming Delivery

Gob Distributor

SGD 330

MAIN DATA

- Max. Speed = 220 cuts/min
- Min. motion time = 120 msec
- Max. jump = 40° (at max speed)

BENEFIT

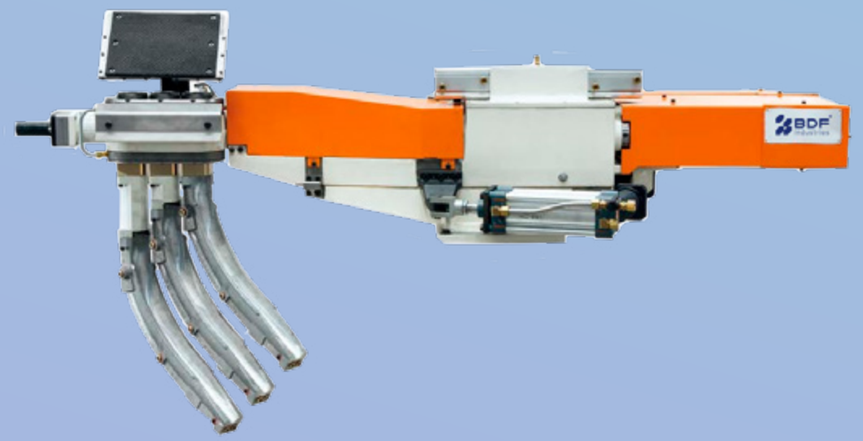
- No belt transmission
- Adjustable mechanical end-strokes
- Automatic scoops central positioning
- High rigidity and low inertia
- Very low vibrations at high speed
- High reliability
- Direct drive systems with planetary gearbox and ceramic ball screw

TECHNICAL FEATURES

- Interchangeable with the previous version
- Motion control with electronic cams
- Controlled by integrated or stand-alone system
- Interface with any type of machine
- Programming of the data by the operator's computer or hand-terminal
- Easy and efficient trouble diagnostic
- 22° rotating in a stand-by position

MECHANISM DESCRIPTION

- Motion control with standard brushless motor
- Coaxial epicyclic reduction gear
- Use of a ball screw for the linear motion of the scoops rack
- Double linear guides (rollers and bushings)
- Double pneumatic cylinders for emergency central positioning
- Ball screw and guides in oil
- Proximity switch for the control of the working position
- Motor cooling with fan air
- Shock absorber for the inlet motion
- Emergency position for safety



MULTI DIRECT DRIVE
GOB DISTRIBUTOR

Multi Direct Drive Gob Distributor
Increase Of Productivity
High Production Speed
High Efficiency
High Reliability
Fully Electronic Setup

NEW
MULTI DIRECT DRIVE X2 / X3 / X4

MAIN DATA

- Max. Speed = 240 cuts/min
- Min. motion time = 100 msec
- Min. waiting time = 150 msec
- Max. jump = 64°

BENEFIT

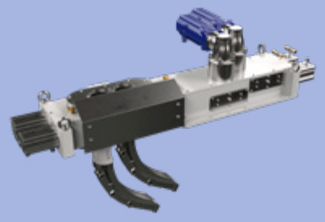
- Electronic independent position control for each scoop
- Possibility to align independently each scoop with trough
- Great improvement of gobs delivery on high production machines with multigobs delivery equipment
- High rigidity and low inertia for high performances
- Very low vibrations at high speed
- High dynamic response

TECHNICAL FEATURES

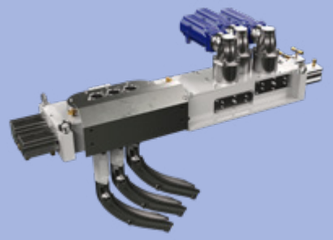
- Interchangeable with the previous version
- Motion control with independent electronic cams per gob
- Emergency with stand-by position out of the glass flow
- Controlled by electronic integrated or stand-alone system
- Interface with any type of machine;
- Programming of the data by the operator's computer or hand-terminal
- Easy and efficient trouble diagnostic
- Local control panel with start, stop, manual MODE, jog, emergency, and hand terminal connector

MECHANISM DESCRIPTION

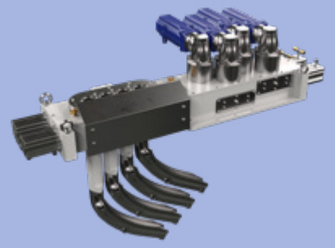
- Motion control with independent brushless motors for each scoop
- Coaxial planetary gearbox for each motor
- Direct drive system with pinion rack for each scoop
- Pinions, racks, and guides all in oil (scoop holder too)
- Pneumatic cylinders for emergency central positioning
- Proximity switch for the control of the working position
- The mechanism, controlled by a pneumatic cylinder, has the possibility to rotate at 22° to put it in a emergency position
- Motor cooling with fan air



Multi Direct Drive X2



Multi Direct Drive X3



Multi Direct Drive X4

NEW
MULTI DIRECT DRIVE SG-DG

MAIN DATA

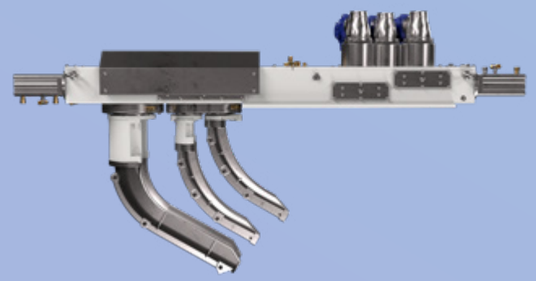
- Max. Speed = 240 cuts/min
- Min. motion time = 100 msec
- Min. waiting time = 150 msec
- Max. jump = 64°
- Max. Ø funnel on SG = 120mm
- Max. Ø funnel on DG = 76mm

BENEFIT

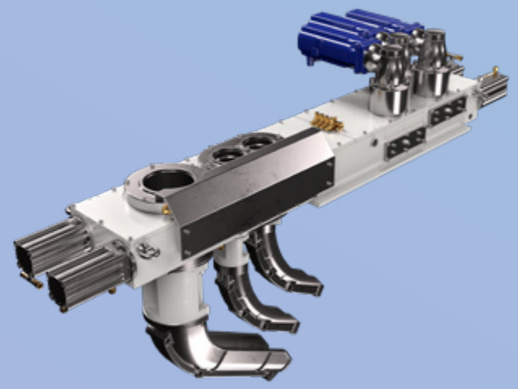
- Very low time changing in DG SG configuration thanks to the deplacement screw located in the mechanism frame
- Electronic independent position control for each scoop
- Possibility to align independently each scoop with trough
- Great improvement of gobs delivery on high production machines with multigob delivery equipment
- High rigidity and low inertia for high performances
- Very low vibrations at high speed
- High dynamic response
- High reliability

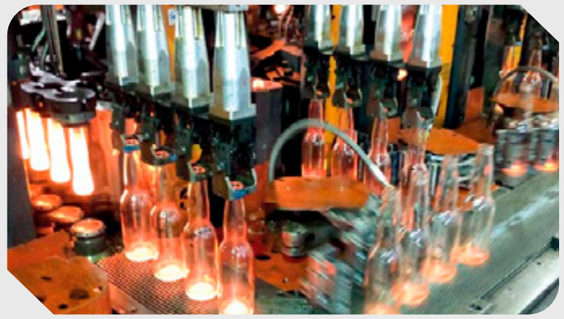
TECHNICAL FEATURES

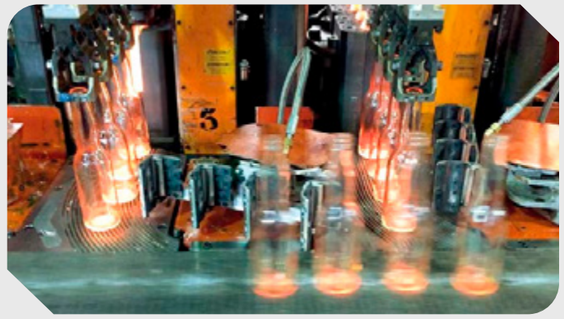
- DG 76 mm and SG 120 mm heads integrated in the same mechanism
- Pneaumatic cylinders for emergency central positioning
- Proximity switch for the control of the working position
- Interchangeable with the previous version
- Motion control with independent electronic cams per gob
- Emergency with stand-by position out of the glass flow
- Controlled by electronic integrated or stand-alone system
- Interface with any type of machine
- Programming of the data by the operator's computer or hand-terminal
- Easy and efficient trouble diagnostic
- Local control panel with start, stop, manual MODE, jog, emergency, and hand terminal connector
- The mechanism, controlled by a pneumatic cylinder, has the possibility to rotate at 22°



Multi Direct Drive SG-DG







Delivery & **Handling** of a quad gob beer bottle production

Forming Delivery

Gob Delivery

DELIVERY RANGE

Final glass container quality depends on a good gob delivery betwen scoop-trough and deflector-mould

TARGETS

- Deliver the gob to the machine with the fastest and most uniform flow
- Develop an easy installation and aligning design to reduce machine downtime
- Grant a high thermal homogeneity for the final glass container's high quality
- Long-life product and less maintenance activity

SCOOPS

HIGH PRODUCTION QUALITY

- Improved gob delivery with new optimized scoop profile
- Perfect control of gob speed and centrifugal force
- Significant defectiveness reduction
- Available with both air ride or water cooling
- Available both made of aluminum alloy and stainless steel

LOW MAINTENANCE

- Increased life duration: aluminum alloy scoops available with LONG LIFE surface treatment

TIME-SAVING

- Reduced machine downtime
- No need of coating with LONG LIFE and additional carbon plasma spray treatments

TROUGHS

HIGH PRODUCTION QUALITY

- Cast iron manufactured with excellent surface finishing
- High thermal inertia: reduced heat transmission between gob surface and trough
- Uniform gob flow with high gob thermal homogeneity

FLEXIBILITY

- U and V shape available
- Interchangeability

DEFLECTORS

HIGH PRODUCTION QUALITY

- Improved gob delivery with precise and repeatable positioning
- Uniform loading
- Optimized inertial diagram of the gob

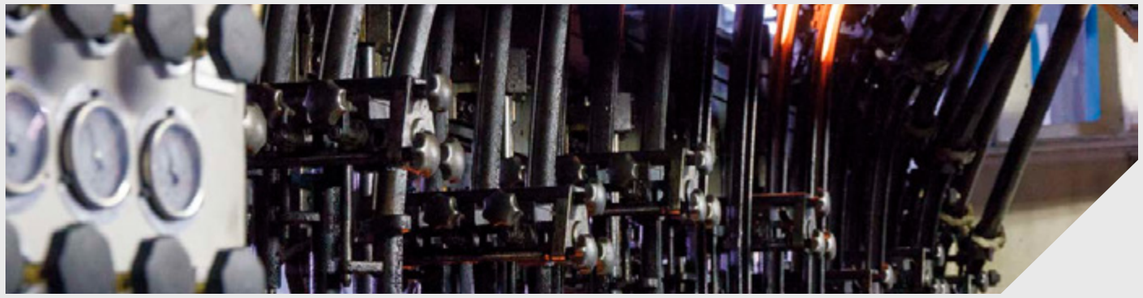
FLEXIBILITY

- Interchangeability
- Both NAV and Easy Aligning versions available (cast iron manufactured)

TIME SAVING

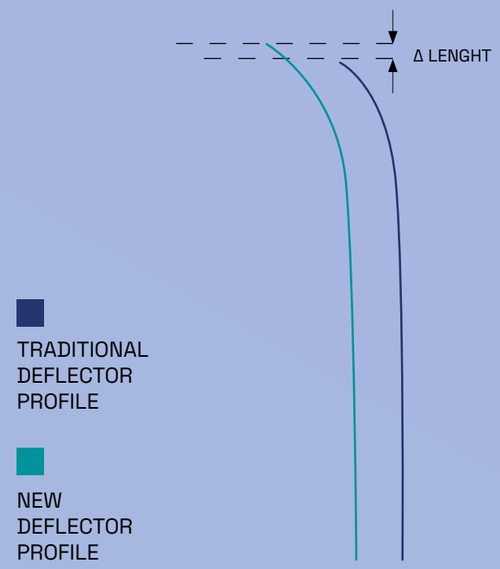
- Improved efficiency and gob speed

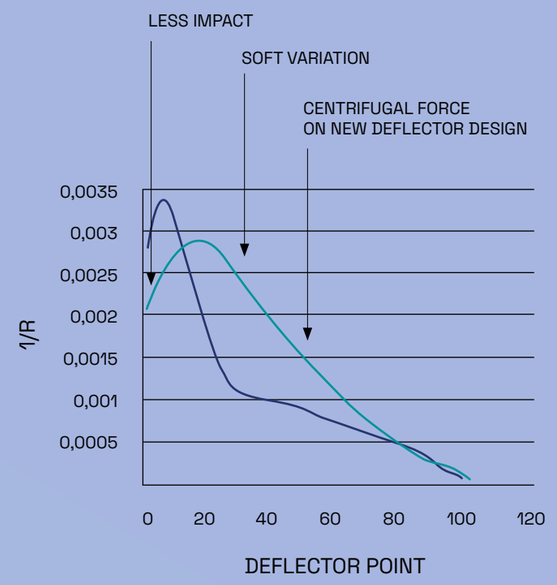
Delivery Reglation System

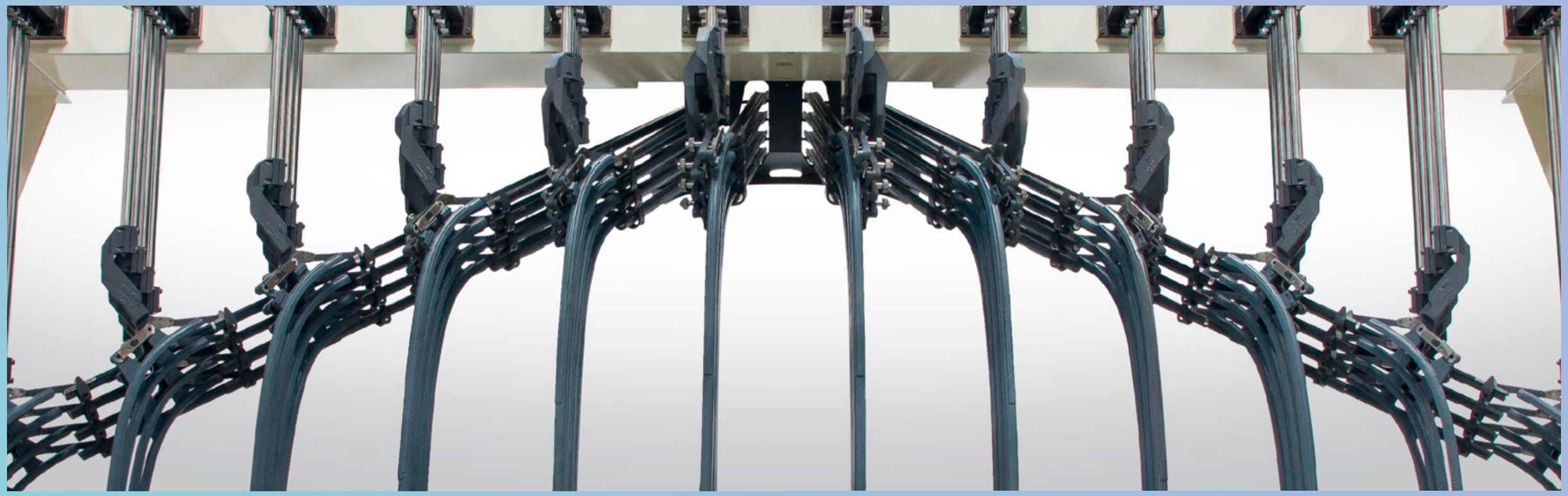


NEW
CONSTANT ANGLE 30°

- 30° constant trough angle
- New deflector profile longer on the trough side
- New deflector design and profile
- Higher gob speed
- Shorter contact time between gob and trough
- More soft centrifugal force variation
- Less deformation of the gob
- Strongly decreased the impact force between gob and trough
- Nullify centrifugal force at the end point of the deflector







EASY ALIGNING DELIVERY SYSTEM

SUPPORT HOLDER

- Trough and deflector support design with spider support for a correct and precise trough\deflector alignment during the delivery adjustment
- Adjustable rigidity by Belleville washers spring system
- Self-centering device for the support without pins
- Absence of vibration to achieve smooth landing
- Laser gauge for a precise set-up of the delivery

DEFLECTOR ADJUSTER

- New design deflector adjuster
- New and stronger anti-backlash deflector adjuster for SG-DG-TG
- Double linear guide for longitudinal adjustment
- Spline guides for transversal adjustment
- Quick change support
- Safety system design

Deflectors Adjuster

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