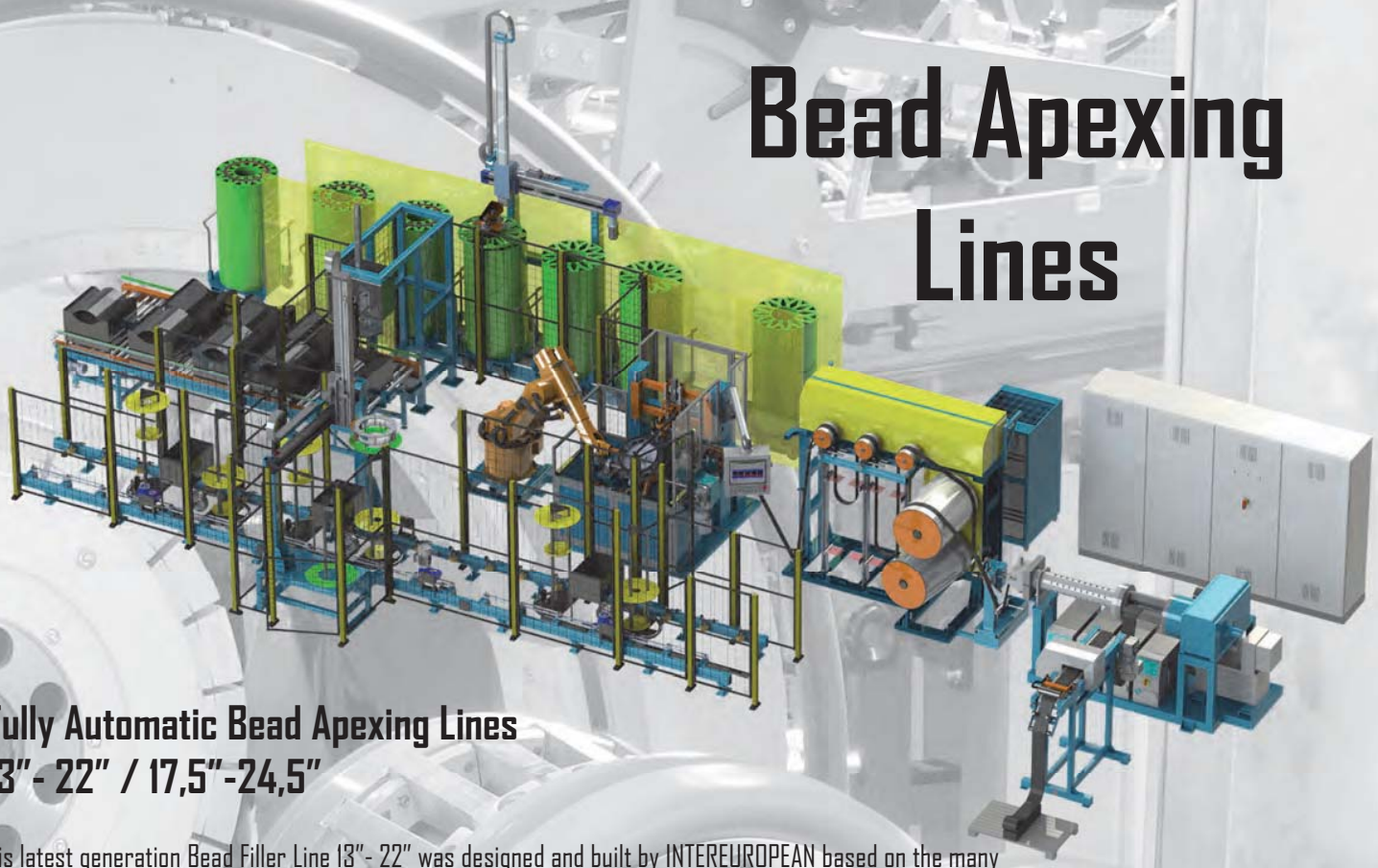
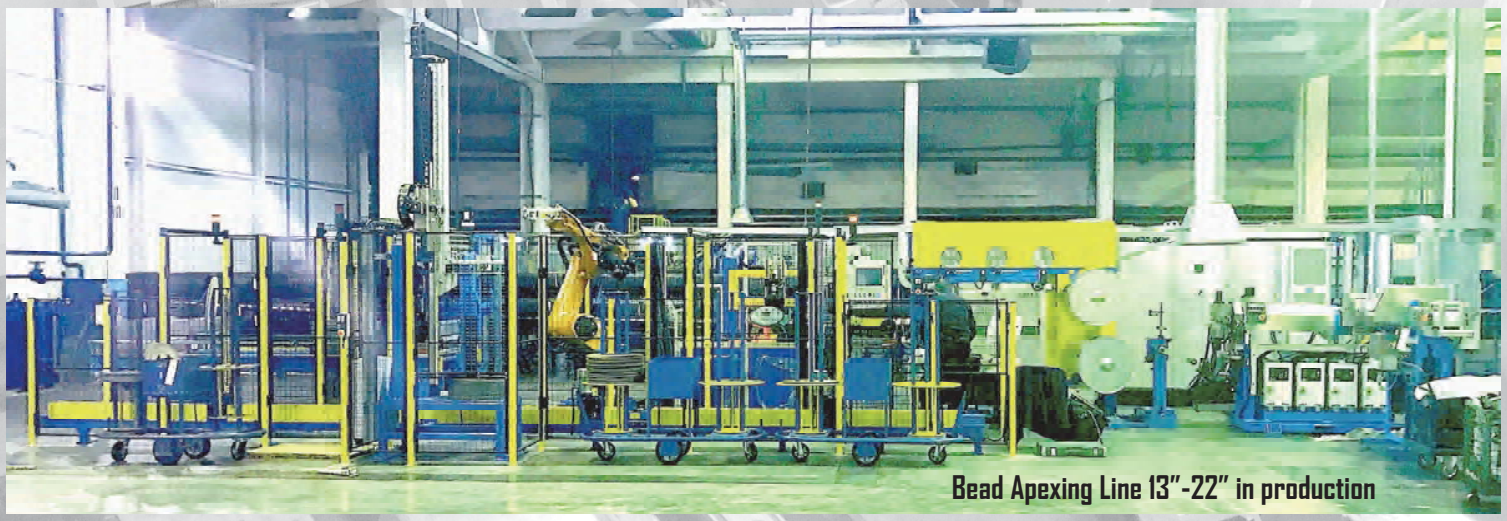
Bead Apexing Lines



Fully Automatic Bead Apexing Lines 13"- 22" / 17,5"-24,5"

This latest generation Bead Filler Line 13"- 22" was designed and built by INTEREUROPEAN based on the many years of production experience in different tire factories and with different rubber compounds, have a number of important advantages compared to the previous generation semi-automatic machines, such as:

- Automated size change
- No more photocells for drum positioning, just a brushless motor with encoder
- Fully syncronized robust splicing system
- Much more powerful 80mm pin type extruder with increased output for producing bigger bead sizes
- Constant speed extruder operation for getting constant apex profile
- High capacity tension controlled festoon
- Adjustable profile splicing fingers for maximum splice quality and uniformity
- Latest generation Allen Bradley PLC based control system with optional remote access for troubleshooting and level 2 factory control system integration
- Online Apex height and splice quality control systems with statistics data processing
- New generation closed circuit water circulation Pack Chiller and Extruder TCUs
- Fully automated operation with optional KUKA robot for beads loading/unloading and manipulators for insertion of separator rings
- High reliability and constant quality of application



Bead Apexing Line 13"-22" in production

Bead Apexing Line 13" - 22"

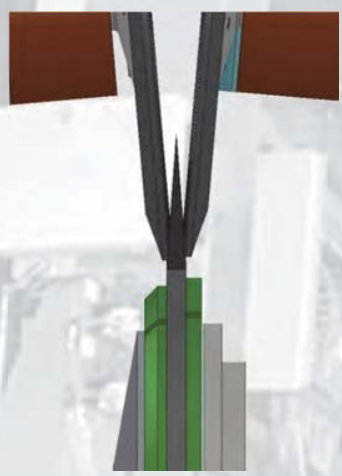
for PCR & LT tires

FILLER APPLICATION UNIT

The Filler Application Unit in equipped with vertical filler guiding channel, dual hot blades for cutting of the trailing end of the filler and three drums on a rotating shaft dividing the filler application into 3 steps:
- application,
- splicing
- unloading of the beads with filler and loading of the empty bead

Bead centering on the drum is guaranteed by the radial expansion of the drum segments.

Application is performed by dual stitching disks with adjustable angle, strongly pressing the filler base to the bead **from both sides.** The pressure applied during application can be easily adjusted according to process requirements, while **stitching from both sides provides maximum grip between the filler and the bead, and allows for using the bead of non-boxed shape (hex, round etc.)**



Apex Stitching from both sides

Automatic Splicing Unit

Butt splice is performed in the second position by the fully synchronized splicing unit using custom profile splicing fingers, made according to the utilized filler profile for perfect splice quality.

Automatic Beads Loading/Unloading by Robot

In the third drum position automatic loading/unloading of the beads is executed by the KUKA 6-axis robot with custom designed bead handling tooling.

Camera for automated splice check

Filler height and Filler splice quality are checked inside the application unit respectively in the application and in the splicing positions by special industrial cameras. Based on the measurements data and pre-set tolerances, the system decides if the filler application quality is accepted or scrapped, giving the corresponding instructions to the robot to unload the bead to the production truck or to the scrap position for checks & repairs by the operator.

Fully Automatic Beads Feeding Station

KUKA Robot

Beads feeding to the system is realized using cassette type feeding station with beads placed into 8 boxes with 50 sections each, keeping the beads separated all the way up to the pick-up position by the robot. Beads feeding into the cassettes is easy and quick and can be done directly at the bead winding line.
Availability of 8 cassettes allows the operator to fill 7 of them with beads while one is working in the station, giving approx. one hour of gap between the feeding operations.
Same concept is used for the trucks feeding and unloading from the system. Provided accumulation capacity allows for approx.. one hour]time between the operator calls for trucks loading/unloading operations.
Separate 2-axis manipulator is installed in the system for separator rings placement between the beads on the trucks.

FLIPPER APPLICATION STATION (optional)

The automatic Flipper Application Station is an optional component of the Bead Apexing Line, which can be added to the standard line without influencing the production output of the main system.

Bead Apexing Line 13" - 22"

for PCR & LT tires

MACHINE PARAMETERS	DESCRIPTION
Net machine cycle time	≤10 sec. (approx. 6 beads per minute)
Number of operators	1 per shift
Centring accuracy of apex application (apex off-centre)	+/- 0,5 mm
Apex splice type	Head-to-head (butt joint)
Apex splice method	Automatic
Number of apex splices	1
Apex application method	Automatic by 2-disk stitching device with adjustable application pressure
Apex cutting method	automatic by dual blade knife
Knife temperature	Hot
Bead Lock & Centering on the drum	By Expansion of the drum segments
Type of apex feeding	By direct extrusion
Apex Extruder Features: - Extruder Type - Extruder Feeding System - Feeding compound sheet dimension - Extruder Speed Control	 Cold Feed **80mm** (pin type) By feeding conveyor with metal detector 80 mm (width) x 8 mm (thickness) Automatic by Dancer Roll
Extruder Temperature Control Unit : - max temperature - tolerance of temperature control - independent control zones	 110°C set ± 2°C 4 zones (head / body 1/ body 2 / screw)
Apex cooling system	Cooling drums fed by cold water from dedicated Pack Chiller
Number of cooling drums	2
Cooling drums features	- Adjustable drum axes position - Spiral water circulation system
Apex festoon capacity	~ 5 m standard ~ 20 m with tension control (optional)

PRODUCT PARAMETERS	VALUES
Bead type	Square / Hex / Round
Bead diameter	13" - 22"
Bead width	5 - 12 mm
Bead height	5 - 12 mm
Apex type	Triangular
Apex base	Flat
Apex height	15 –65 mm
Apex fitting angle	80°- 90°
Apex width	5 - 12 mm
Apex temperature (after cooling)	Max 35°C
Viscosity of apex (Mooney Standard at 100°C)	Min - 65 Max - 82
Environment temperature	Max 30 °C
Hardness of apex after curing	70 - 90 (shore A)

Constant Apex Splice quality

INTEREUROPEAN Pin Type Apex Extruder