

# TeraSpin

## Product Overview

November 2024



# Presentation at a glance

## Introduction:

- A.T.E. at a glance
- TeraSpin – an introduction

## Product families:

- Spindles with HF insert
- Weighting arms
- Top rollers
- Cradles
- Drafting up-gradation kit
- Top roller grease (TRG 5)

## New developments:

- Smart cradles
- Smart yarn catchers
- Premium ES spindles
- Flexi weighting arms
- HF S series spindles

# Introduction

## A.T.E. at a glance

**5000+**

Happy customers



**500+**

World-class products



**6**

Core technologies



A.T.E. is an **expert partner** for textile machinery, and an **impactful innovator in clean technology**.

We help our customers **create great products, save water and energy, reduce waste, and enhance the safety and well-being** of their teams.

# A.T.E. at a glance

A.T.E. is an **expert partner for textile machinery**, and an **impactful innovator in clean technology**.



Textile Engineering



Precision Components



Wastewater Treatment



Intelligence of Things  
for Industry



Cooling



Safety, Health, and  
Environment for Packaging,  
Textiles, etc.

We help our customers **create great products, save water and energy, reduce waste, and enhance the safety and well-being** of their teams.

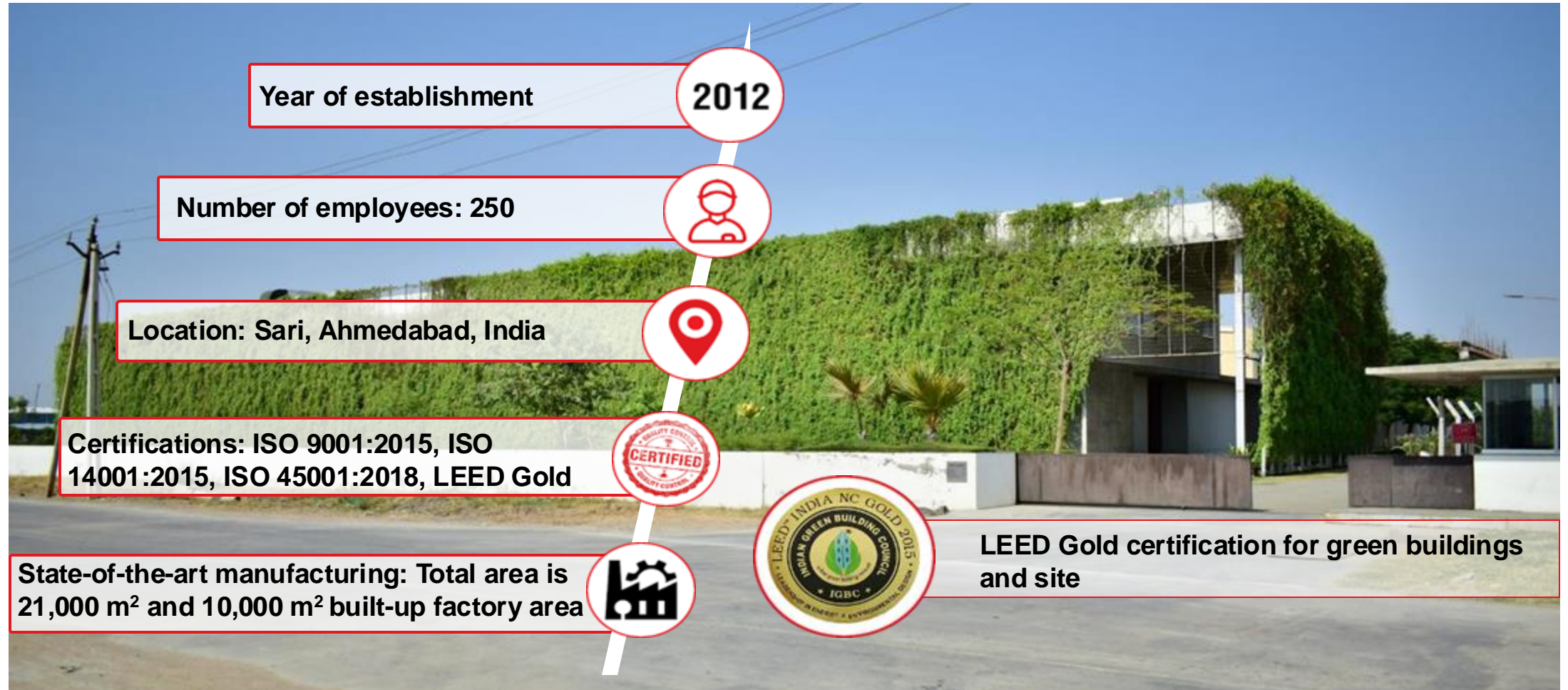


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# TeraSpin – introduction



# TeraSpin products – at a glance

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>▪ Spindles – for any make &amp; model of ring frame</li><li>▪ Weighting arms for roving and ring frames</li><li>▪ Customised up-gradation kits for drafting</li><li>▪ Spindle bearing units (inserts) for ring frame spindles</li></ul> | <ul style="list-style-type: none"><li>▪ Top rollers</li><li>▪ Cradles</li><li>▪ Distance clips</li></ul> |
|---|--|



# TeraSpin – processes



- Implemented some of the best practices & tools like DMAIC, SPC, MSA, Kaizen, TPM, FMEA & DOE
- TeraSpin team has been working continuously to 'fail safe' all processes with a common goal to get 'right the first time'
- Focusing more on product innovation with significant investment in R & D
- As part of environment, health & safety initiatives, TeraSpin is striving for zero pollution, zero waste, zero liquid discharge & zero injuries

# TeraSpin – processes



Proven and consistent quality



High precision



Competitive pricing



Technical expertise



Reliable supplier



# TeraSpin – spinning mill customers

## Spinning mills in India:

- Arvind Group
- Nahar Group
- Vardhman Group
- Sutej Group
- Trident Group
- KPR Group
- Premier Group
- Ramco Group
- Shanmugavel Group
- RSWM Group
- ... and many more

## Spinning mills abroad:

- Triveni, Nepal
- Jamuna Group, Bangladesh
- MSA Group, Bangladesh
- Saiham Group, Bangladesh
- Lucky Spinning, Thailand
- PT Lotus, Indonesia
- Indigo Textile, Egypt
- Phu Group, Vietnam
- Tainan Spinning, Taiwan
- Supratex, Nigeria
- Cotton Road, Uzbekistan
- ... and many more

# TeraSpin – OEM customers

## OEMs:

- LMW, India
- KTTM, India
- Electro-Jet, Spain
- Marzoli, Italy
- Saurer, Germany
- Shanxi Best Machinery, China
- Takahashi, Japan
- Khadi Village Industries Commission, India
- Partzsch, Germany
- ... and many more

# TeraSpin – customers around the globe





Product families

# Spindles with HF inserts



Configurations				
Insert	HF 100	HF 1	HF 21	HF 21C
Maximum design speed (rpm)	25,000	22,000	20,000	18,000
Tube length (mm)	Up to 190	Up to 210	Up to 270	Up to 300
Min. wharve Ø (mm)	18/18.5*		20.2	22.2

- \*Regular spindles: min. wharve dia. of 18.5 mm
- \*Premium Energy Saving spindles: min. wharve dia. of 18 mm



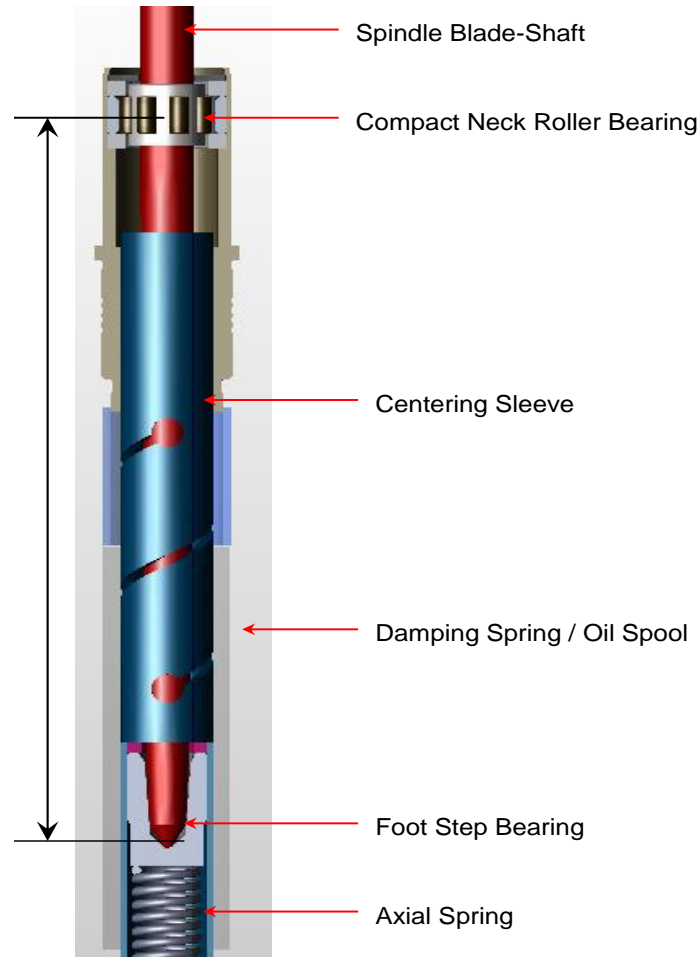
# Spindles with HF inserts



## Design combination of spindles:

- Spindles for manual doffing ring frames
- Spindles for auto-doffing ring frames:
  - with TeraSpin Smart Yarn Catchers (SYC)
  - with knurling and cutter (K&C)
- Suitable for 4-spindles tape drives or tangential belt drives
- With self-locking inserts or external locking hooks
- Aluminium plug type spindles
- With spring type buttons or centrifugal type buttons

# Spindles with HF inserts - insert construction

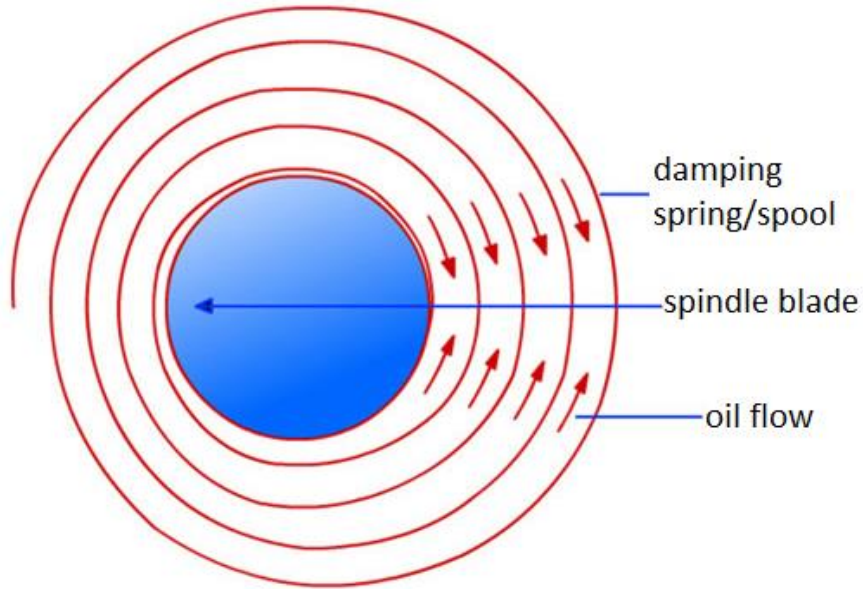


- Well proven conical foot-step
- Axial buffer spring below the foot-step bearing
- Precision wound spiral coils of oil spool
- Compact neck roller bearing
- Steel bolster for better strength and heat dissipation

## For HF-100 spindle inserts

- Shorter spindle blade length
- Reduced spindle oil content (by 20%)

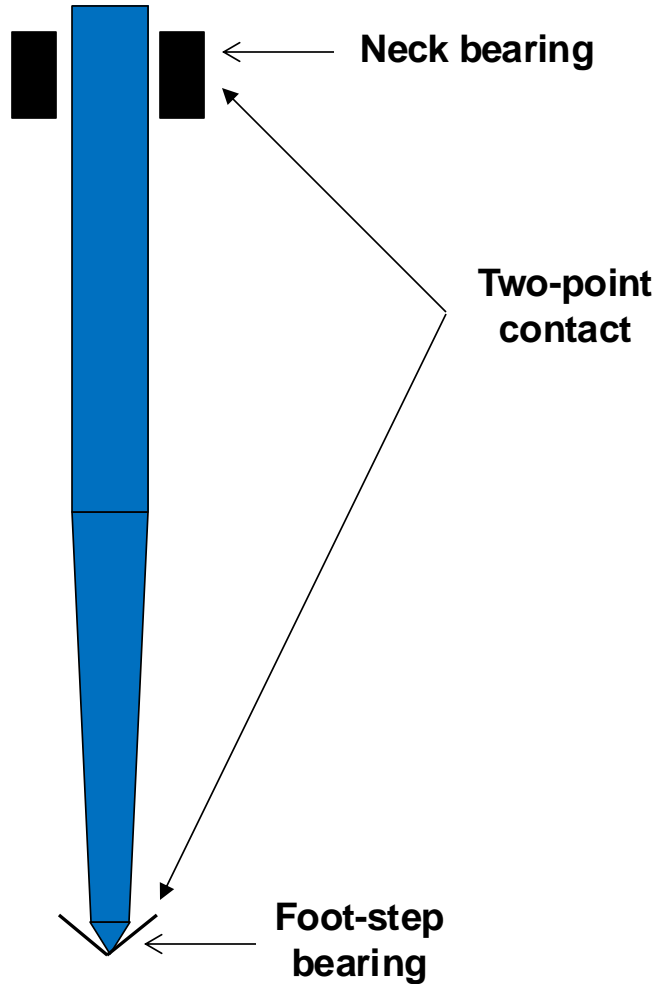
# Spindles with HF inserts - damping effect



- Precision wound spiral coils of oil spool, surround the flexible centering sleeve and perform a dual task:
  - Dampens vibrations all the way till the axial spring below the foot-step bearing
  - Facilitates uniform and continuous lubrication of axial spring and foot-step bearing to neck bearing

**The spindle is free to spin, but its lateral movement is damped**

# Spindles with HF inserts – two-point contact



- Point contact between spindle blade tip and footstep bearing ensures extremely low co-efficient of friction and hence, lowest energy consumption
- Freely floating foot-step ensures continuous alignment of spindle top part axis with spindle insert axis with two-point contact

# Spindles with HF inserts

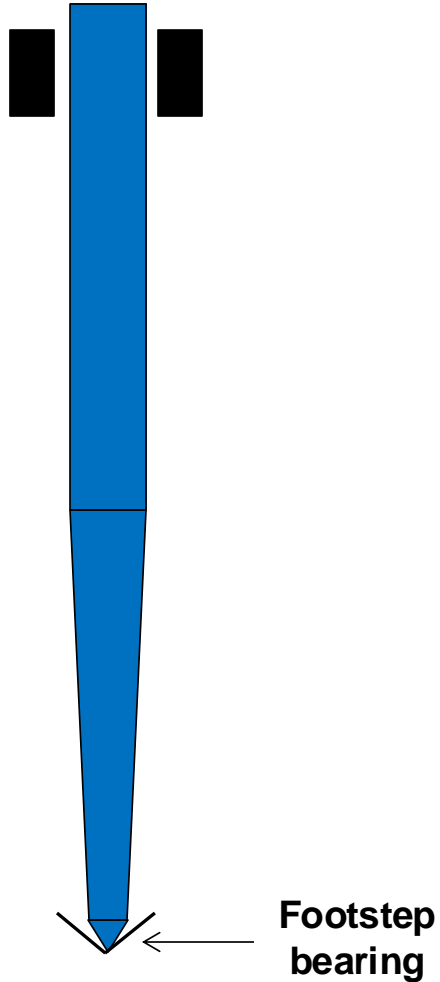


## Axial spring below foot-step bearing

- Calibrated axial compression spring below the foot-step bearing absorbs load on the spindle tip that may arise during ring rail motion, doffing and donning operations
- This unique feature of the HF series inserts avoids accidental damage the tip due to impact



# Spindles with HF inserts – lubrication of foot-step bearing



- Design of the centering sleeve whirls up the oil up to the neck bearing unit at higher speeds and keeps it lubricated
- The difference in the cone angle of the foot-step bearing and the spindle blade tip allows a very good hydro-dynamic lubrication condition
- Thin oil film i.e. hydrodynamic film created between spindle blade tip and foot-step bearing cone keeps the blade tip virtually contactless with the foot-step

[Watch how oil flows and circulates in the bolster cavity when a spindle starts](#)

# TeraSpin vs competitor

- [Oil temperature inside the bolster was found less in TeraSpin spindles by 1°C](#)
- [Vibration level at the spindle beam as well as at the bottom of the bolster was found same in TeraSpin as well as in competitor's spindles](#)
- [Stable running behaviour even at lower spindle speed](#)

# Weighting arms PK



Weighting arm range			
Type	PK 2000 series	PK 1500 series & PK 1600-40	PK 1601-01
Application	Ring spinning	Roving frame	Worsted spinning
Fibers	Cotton, man-made fibers and their blends		Wool and wool blends
Top roller loading	Pre-compressed coil spring		
Nipping force	Individually set for each roller position		
Finish	Yellow/Silver passivation		

# Weighting arms – ring spinning



PK 2025



PK 20235



PK 2025-22R



PK 2035-22R

	PK 2025 PK 2025-22R	PK 2035 PK 2035-22R
Top roller dia. (mm)	28/25/28	35/25/35
Cradle type	Short	Medium/long

	Top roller load (daN)	
	PK 2025 PK 2035	PK 2025-22R PK 2035-22R
Front	6/10/14/18	10/14/18/22
Middle	10/14	
Rear	12/16	

# Weighting arms – roving frame: 3-rollers drafting



PK 1500-0962604 YB



PK 1500-0962604 SB



PK 1500-0962604 SR



PK 1500-0962602 YB



PK 1500-0962602 SB



PK 1500-0962602 SR

	PK 1500-0962604		PK 1500-0962602
Cradle	Short	Medium/Long	Short/Medium/Long
Top roller dia. (mm)	6/10/14/18	10/14/18/22	35/25/35



# Weighting arms – roving frame: 4-rollers drafting



PK 1500-0001938 YB



PK 1500-0001938 SB



PK 1500-0001938 SR



PK 1600-40 YB



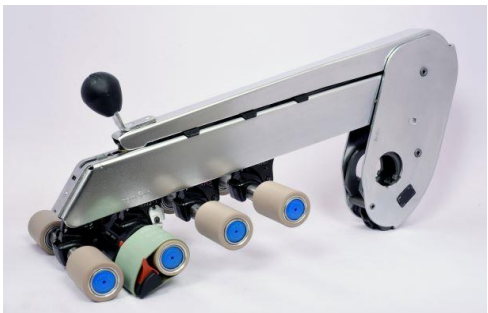
PK 1500-0001940 YB



PK 1500-0001940 SB



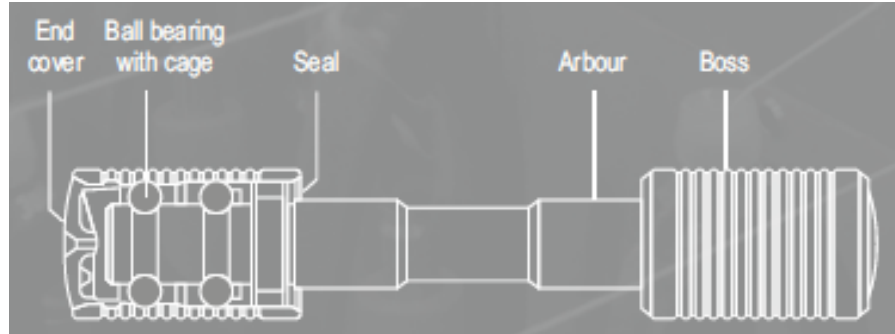
PK 1500-0001940 SR



PK 1600-40 SB

	PK 1500-0001938	PK 1500-0001940	PK 1600-40
Cradle position	3rd roller	2nd roller	2nd roller

# Top rollers



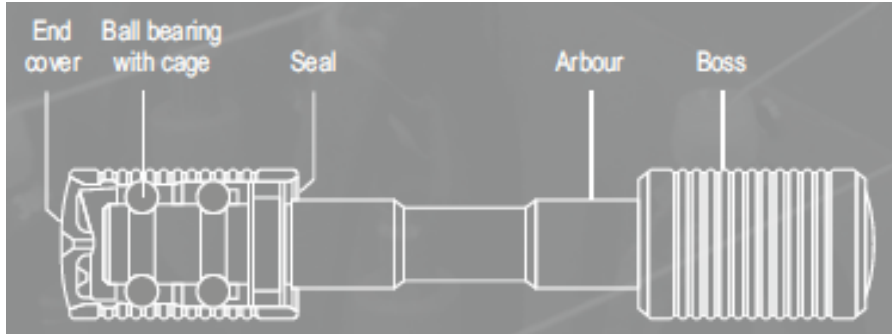
## Features:

- Each roller assembly is made with the most appropriately sized balls, matching the ID of shell with OD of axle
- Automatic selection of ball size in steps of 0.002 mm
- Through hardening of axle and outer shells
- Proven & effective U-type sealing
- Lubricated with special TRG 5 grease

## Benefits:

- Higher load carrying capacity
- Smoother rolling of top rollers resulting in better & consistent yarn quality
- Smoother rotation leading to longer service life
- No ingress of contamination
- Reduced maintenance – extended re-lubrication intervals due to TRG 5 grease

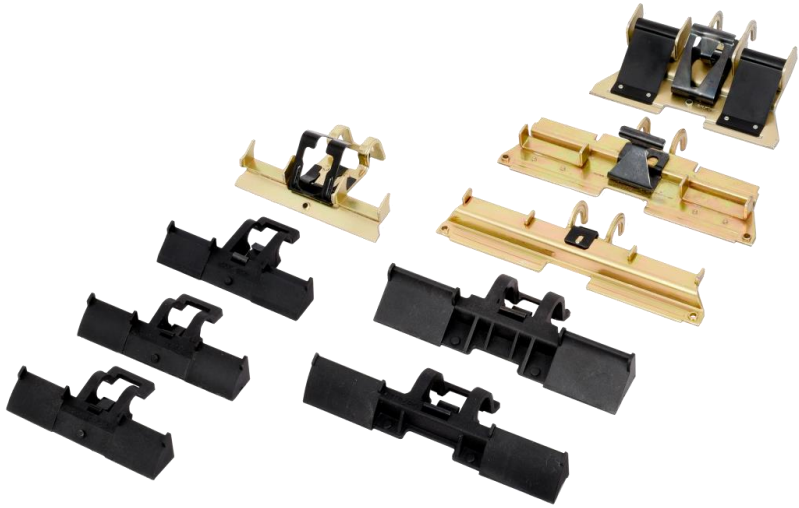
# Top rollers



## Can offer top rollers for:

- TeraSpin/SKF drafting for short staple ring frames
- TeraSpin/SKF drafting for worsted ring frames
- TeraSpin/SKF drafting for roving frames
- Texparts drafting for short staple ring frames, roving frames & worsted ring frames
- LMW/Rieter P 3-1 drafting

# Cradles



## Features:

- Metal and FRP cradles
- Rigid and stable structure for use under mill conditions
- Design ensures gentle nipping and effective fibre control
- FRP cradles are lighter in weights compared to sheet metal cradles
- Clean surface for smooth rotation of top aprons
- FRP cradles can easily replace existing metal cradles

## Benefits:

- No deformation with FRP cradles ensuring high quality of roving/yarn
- Common spacers for both FRP and metal cradles
- Consistent roving/yarn quality
- Maintenance-free

Also suitable for TEXParts weighting arms of PK 1500/1600 series and PK 2000 series.

# Drafting up-gradation kits



Customised drafting up-gradation kits for roving frames as well as ring frames to replace any make & model of existing drafting.

## **Benefits:**

- Increased spindle speed and productivity
- Reduced energy consumption
- Improved and consistent quality of output
- Extended machine life
- Improved price/performance ratio

**An economical option over investment in new machines.**



# Top roller grease: TRG 5



## Features:

- Barium based grease, especially suited for spinning mill environment (high temperature and humidity)
- High load carrying capacity
- Good metal affinity
- Excellent water-resistant properties
- Wider range of working temperature ( $-30^{\circ}\text{C}$  to  $+140^{\circ}\text{C}$ )

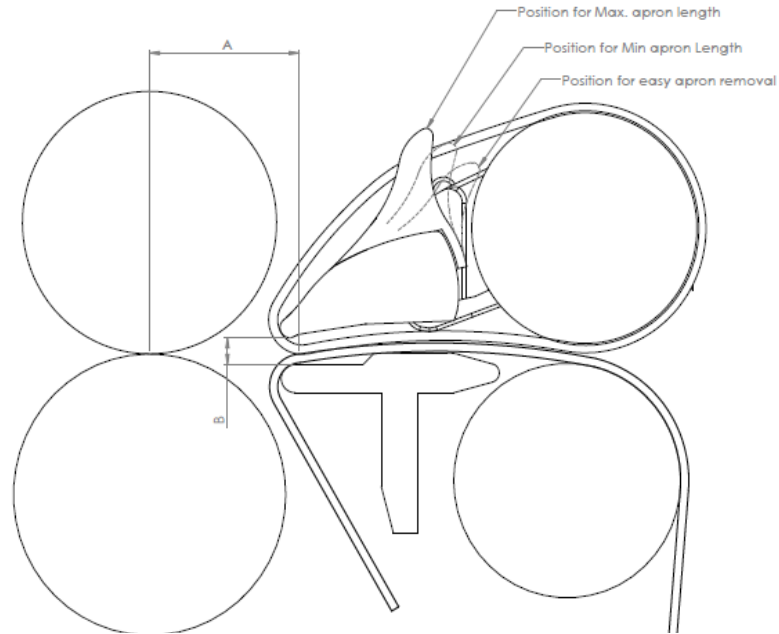
## Benefits:

- High load bearing capacity
- Extended re-lubrication intervals reduce maintenance
- Smooth trouble-free operation under mill conditions
- Consistent quality output
- Unique packing of grease in the bucket reduces wastage



New developments

# Smart cradles for ring frames & roving frames



## Features:

- Minimum contact area minimises friction during apron rotation
- Unique design ensures a fixed radius and hence a uniform distance between apron nip and front roller nip
- Accommodates variations in apron length and maintains uniform apron tension

## Benefits:

- Reduced yarn imperfections
- Longer apron working life
- Easy apron removal and mounting during maintenance

## [Success story](#)



# Smart yarn catcher (SYC)



SYC addresses the drawbacks of a conventional yarn catcher/cutters viz.

- Accumulation of residual yarn on spindle at the end of every doff
- Hard waste on spindles creating imbalances and increased power consumption
- Involves manual cleaning, entailing many man-hours
- Loss of production

# Smart yarn catcher (SYC)



## Features:

- Automatic opening and closing of clamping faces with change in spindle speed
  - Clamping faces open at about 12500 rpm (+/-500 rpm)
  - Clamping faces close at about 6000 rpm (+/-500 rpm)
- Firm grip of yarn between upper and lower clamping faces
- Special cutter for reliable yarn cutting

## Benefits:

- Minimum yarn used for clamping <1 turn
- No accumulation of residual yarn
- No cleaning of residual yarn – less labour hours
- Reduced start-up breaks resulting in improved ring frame productivity
- Very long service life

## [How it works...](#)

## [Performance of SYC spindles at AGT Mills](#)

# Premium ES spindles



## Features:

- Minimum wharve diameter: 18 mm (with HF-1 and HF-100)
- Suitable for manual doffing and auto-doffing
- Higher level of manufacturing precision for all spindle components
- Compact neck bearing manufactured with higher precision
- Optimised damping of spindle vibrations with improved design and German components
- Axial spring support against any accidental axial impact

## Benefits:

- Significantly lower energy consumption
- Low vibrations and low noise level
- Long life

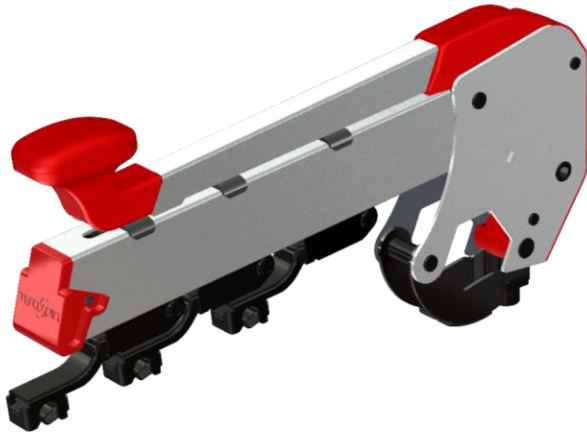
## Performance at customers' place:

[Ne 18 CH against HF-100](#)

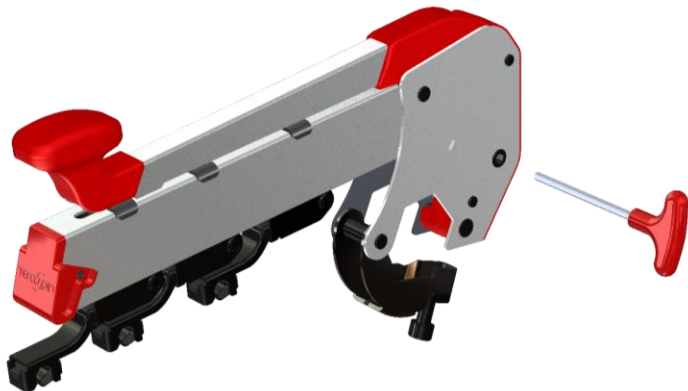
[Ne 38 Dyed Pol against HLLD](#) [Ne 61 CW against CS 1](#)



# Flexi weighting arms



**Suitable for hexagonal arm bars**



**Easy installation and height setting**

## Features:

- Fits on the existing hexagonal tube of a pneumatic drafting system
- Accommodates the existing front/back top rollers
- Adaptable to existing compact yarn systems
- Consistent reliable loading through helical coil springs
- Options of 5 different loads on each top roller
- Easily replaceable individual weighting elements
- Easy height (pressure) setting
- Adjustable front top roller off-set up to 6.5 mm

## Benefits:

- No compressed air for loading of weighting arms
- Consistent loads delivering consistent yarn quality
- Ease of installation & retention of existing components
- Ease in maintenance – no pressure checking/losses due to compressor & change of cot diameters
- Flexibility to handle wide variety of fibers/yarn counts to suit today's fashion industry demand
- Attractive price:performance ratio
- Longer reliable service life
- Contributes to your initiative of sustainable solutions in the textile industry

# Matrix of flexi weighting arms

Model	Arm bar	Cradle	Top roller position (front – middle – rear)
PK S 3220	Hexagonal	Short	LMW – TeraSpin – LMW
PK S 3225	Hexagonal	Medium/long	LMW – TeraSpin – LMW
PK S 3224	Hexagonal	Short	H-Fang compact – TeraSpin – LMW
PK S 3226	Hexagonal	Short	LMW Spinpack – TeraSpin – LMW

Improvement in yarn quality under controlled trials.

- [Ne 30s PC](#)
- [Ne 40s 100% Cotton](#)
- [Ne 46s K](#)
- [Ne 50s 100% Dyed Pol](#)
- [Ne 90s Recycled Pol](#)

# HF S series spindles – HF S 681



## Features:

- Maximum mechanical speed up to 30,000 rpm
- Min. wharve diameter:
  - 18 mm for ES (Energy Saving) spindle
  - 18.5 mm for other spindles
- Sphero point foot-step design
- Two radial bearings for higher radial loads
- Shorter blade length
- Suitable for various makes and models for ring spinning frames

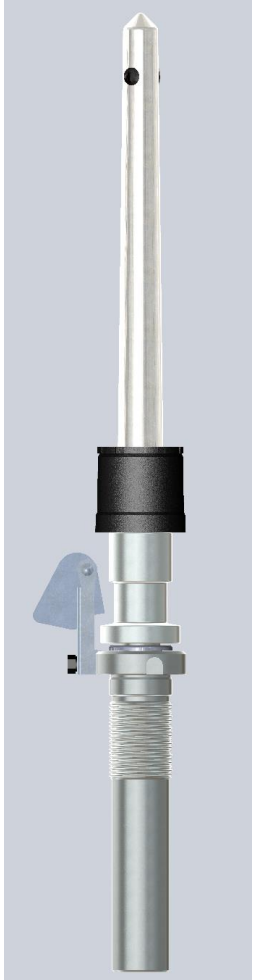
## Supplied with multiple options:

- External hook or internal locking (SL) system
- Smart yarn catcher or knurling and cutter
- Spring-loaded or centrifugal buttons

## Benefits:

- Stable running at high loads
- Energy efficient
- Excellent price:performance ratio

# HF S series spindles – HF S 682



## Features:

- Maximum mechanical speed up to 30,000 rpm
- Min. wharve diameter:
  - 18 mm for ES (Energy Saving) spindles
  - 18.5 mm for other spindles
- Sphero point foot-step design
- Two radial bearings for higher radial loads
- Dual damping system
- Double elastic bolster construction with grease between the two housings for additional damping
- Suitable various makes and models of ring spinning frames

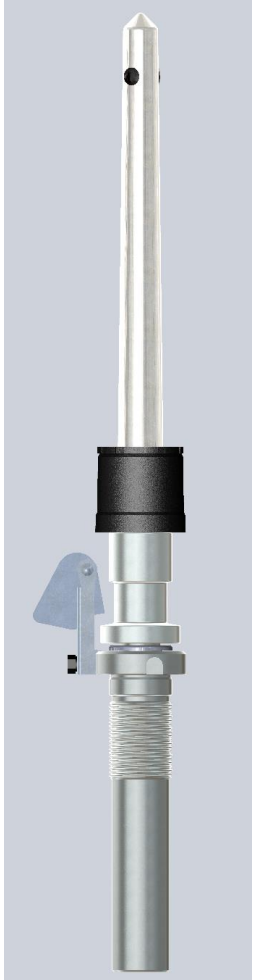
## Supplied with multiple options:

- External hook or internal locking (SL) system
- Smart yarn catcher or knurling and cutter
- Spring-loaded or centrifugal buttons

## Benefits:

- Very high spindle speed
- Energy efficient
- Very low noise
- Very low vibration

# HF S series spindles – HF S 562



## Features:

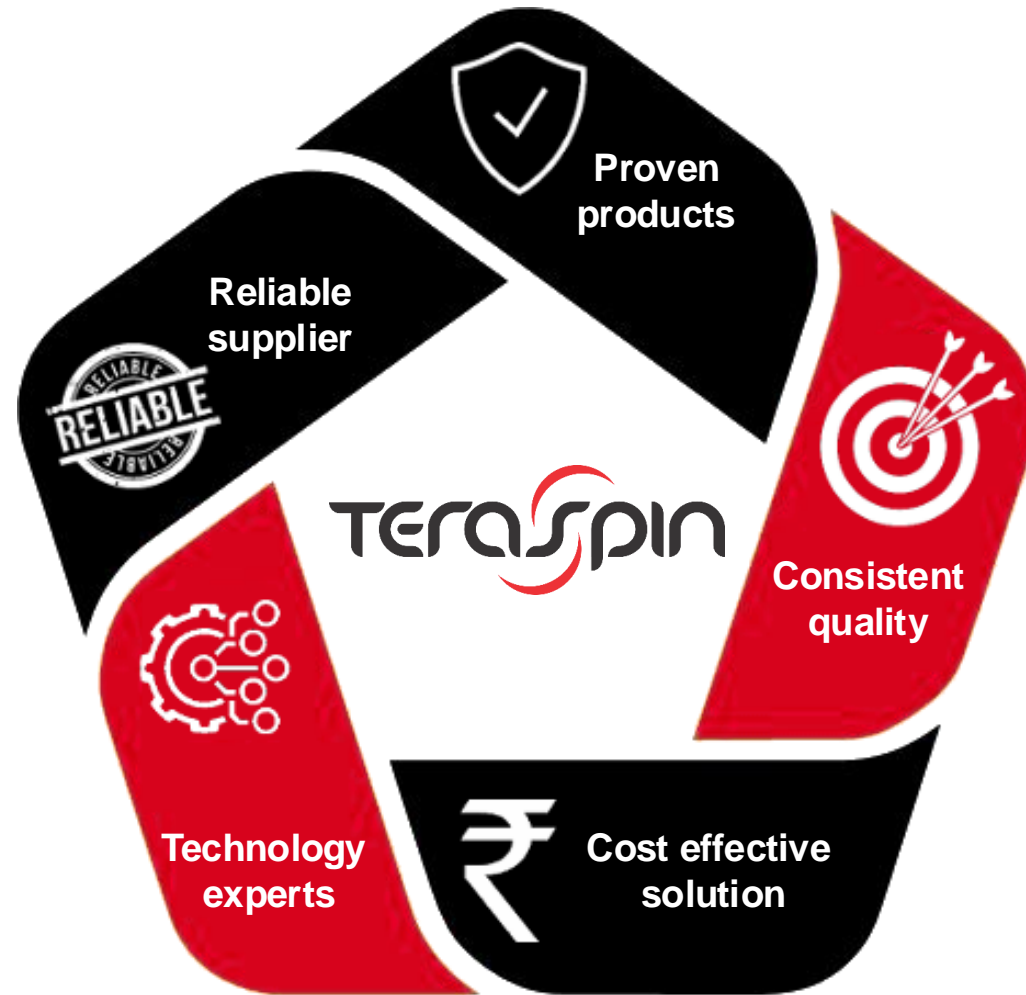
- Maximum mechanical speed up to 30,000 rpm
- Min. wharve diameter:
  - 17 mm for SES (Super Energy Saving) spindles
  - 17.5 mm for ES (Energy Saving) spindles
- Sphero point foot-step design
- Two radial bearings for higher radial loads
- Dual damping system
- Double elastic bolster construction with grease between the two housings for additional damping
- Suitable various makes and models of ring spinning frames

- Suitable for yarn count Ne 30 & above
- Supplied with multiple options:
  - External hook or internal locking (SL) system
  - Smart yarn catcher or knurling and cutter
  - Spring-loaded or centrifugal buttons

## Benefits:

- Very high spindle speed
- Very low energy consumption
- Very low noise
- Very low vibration

# TeraSpin – the smart choice



# Thank You



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