

Bräcker



Long Staple Spinning,
Flax Spinning and Twisting

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Long staple spinning, flax spinning and twisting

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- Introduction**
- Compared to the spinning of short staple fibres, such as Cotton, Polyester, Rayon and their blends, long staple fibre spinning and twisting of all kind of threads is done on lubricated rings. Wool and other long staple fibres have relatively high micronaire values and are not able to create a fibre lubrication film on the ring. The same effect we have on twists or filaments.
- The task of rings and travellers remains: imparting the twist, creating a tension and winding the yarn or twist on a cop or bobbin.
- Since this ring/traveller system is actively lubricated, the tension control does not depend on fibre lubrication respectively on the fibre type. The ring type, its lubrication and the lubricant in use are more important in these processes.
- Still of high importance is the shape of traveller and its weight.
- Twists resulting mainly in coarse counts and hence heavy travellers are in use. The high traveller speeds of such heavy travellers create high ring loads. On the other hand heavy steel travellers are difficult to insert and remove from the rings. Steel travellers for coarse counts are replaced by NYLTEX travellers. The used Nylon (PA 6.6) has a higher coefficient of friction and lighter travellers can be used, creating still the requested tension.
- Steel travellers** are mostly used for worsted, semi-worsted and acrylic spinning and fine count twisting.
- NYLTEX travellers** are mostly used for heavier yarn count spinning and twisting and are a must for flax spinning and glass filament twisting.
- Spinning**
- Worsted, semi-worsted and acrylics**
- With conical rings and steel or NYLTEX travellers. Heavier yarn counts, such as carpet yarns are also processed on vertical sinter metal rings and NYLTEX travellers.
- Acrylics**
- SU-ring and SU-traveller system as an alternative solution to conical rings and steel travellers.
- Wet flax / linen**
- Wet spinning yarns are processed on non corrosive flange rings and NYLTEX travellers.
- Twisting**
- General twisting**
- With vertical sinter metal rings and NYLTEX travellers.
- Draw twisting**
- With vertical sinter metal rings and steel or STEELTEX travellers.
- Glass filament twisting**
- With vertical sinter metal rings and NYLTEX travellers. To prevent filament damages the special designed NYLTEX travellers create smooth tension and bear an optimum yarn passage.
- The following pages provide information on specific applications.

Long staple spinning

Spinning of worsted, semi-worsted and acrylic yarns, processed on conical rings with steel or NYLTEX travellers or SU-rings and steel travellers.

Conical rings and travellers

This spinning process of worsted and semi-worsted yarns is mainly made on self-lubricating conical rings with J-shaped steel travellers for finer and steel or NYLTEX travellers for heavier yarn counts.

Travellers for long staple spinning - Delivery program

No.	ISO	Steel			NYLTEX						
		J 9.1	J 11.1	J 11.1	J 11.1	J 17.4					
		OSt r	r	CST-B r	KST r	ER	LER	ER	LER	ER	LER
39	12.5										
38	14										
37	16										
36	18										
35	20										
32	22.4										
31	25										
30	28										
29	31.5										
28.5	35.5										
28	40										
27.5	45										
27	50										
26.5	56										
26	63										
25	71										
24.5	80										
24	90										
23.5	100										
23	112										
22	125										
21.5	140										
21	160										
20	180										
19.5	200										
19	224										
18.5	250										
18	280										
17.5	315										
17	355										
16	400										
15	450										
500											
560											
630											
710											
800											
900											
1000											
1120											
1250											
1400											
1600											
1800											
2000											
2240											
2500											
2800											
*											

- Recommendations for spinning of long staple fibres on conical rings
- Steel travellers for fine to medium yarn counts
 - NYLTEX travellers for medium to coarse yarn counts
 - The traveller shape, especially the yarn path, has to be chosen according to the yarn count and type. Consider enough space when producing bulky yarns.

* heavier nos. on request


Steel traveller finishes
 Regular type

NYLTEX traveller qualities
 • Lubricidur
 • F. (glass fibre reinforced)



Ring / traveller combination for long staple spinning

The conical ring with J-shaped travellers is the most effective and proven combination for spinning of wool, acrylics, cashmere and blends.

Tex	Yarn count		Ring height				
	Nm	New	9.1	11.1	17.4		
500	2	3.9					
330	3	5.8					
250	4	7.8					
165	6	11.6					
125	8	15.5					
100	10	19.4					
84	12	23.3					
71	14	27					
63	16	31					
56	18	34.9					
50	20	38.8					
42	24	46.5					
36	28	54.3					
31	32	62					
28	36	69.8					
25	40	77.5					
22.5	44	85.3					
20	50	96.9					
18	56	108					
16.5	60	116.3					
14.5	70	136					
12	85	165					
10	100	194					
8.5	120	232					
7.2	140	270					
	recommended						
	possible						

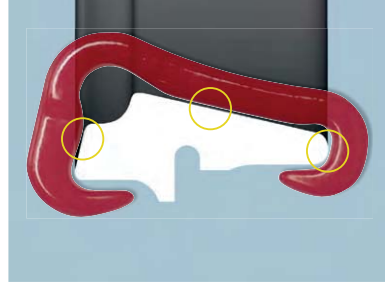
No's in **bold print** are recommended

- Listed ring heights are recommendations. Please refer to the rings presently in use for specifications.
- All traveller weights listed are available. Final specification to be confirmed through in-mill trials.

Heavier yarn counts for carpet yarns are also processed on vertical sinter metal rings and NYLTEX travellers. Please see table for traveller weights on page 5.

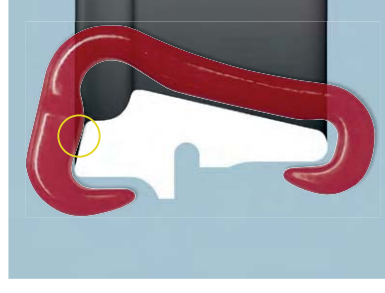
Selection of the correct NYLTEX traveller weight (J-travellers)

correct weight



Uniform wear along vertical back, head and foot

too heavy




Excessive wear on head tension is too high

too light

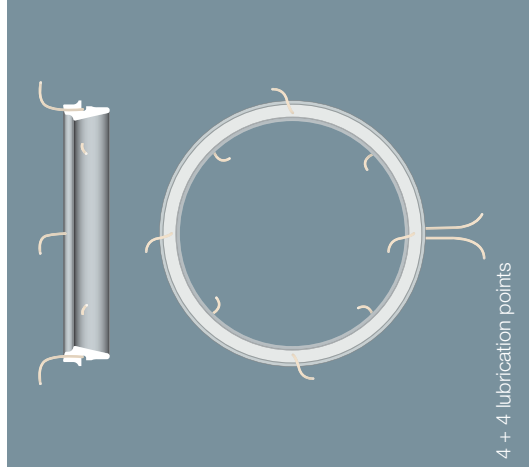


Excessive wear on foot tension is too low

Heavy wear along the vertical inner back – ring lubrication needs to be checked.

Traveller weight / No.		
Steel	NYLTEX	
Bräcker No.	ISO No.	ISO No.
		710 - 900
		560 - 630
		450 - 500
14 - 15	710 - 900	280 - 355
15 - 16	560 - 710	250 - 280
16 - 17	450 - 560	224 - 250
17 - 18	355 - 450	160 - 180
18 - 19	250 - 355	125 - 140
19 - 20	180 - 250	112 - 125
19 - 21	160 - 250	100 - 112
20 - 22	125 - 180	90 - 100
21 - 23	112 - 160	80 - 90
22 - 23	112 - 125	
23 - 24	90 - 112	
24 - 25	71 - 90	
24 - 26	63 - 90	
26 - 27	50 - 63	
25 - 28	40 - 71	
26 - 29	31.5 - 63	
27 - 30	28 - 50	
28 - 31	25 - 40	
29 - 31	25 - 31.5	
30 - 34	20 - 28	
31 - 34	20 - 25	
32 - 38	14 - 22.4	

Conical rings and travellers for processing wool, acrylics, cashmere and blends



Rings 9.1 and 11.1 4 + 4 lubrication points, 2 wick exits
Rings 17.4 6 + 6 lubrication points, 4 wick exits

Other lubrication systems on request



Spinning of long staple fibres requires lubricated spinning rings.

Ring quality

Bräcker supplies conical spinning rings with the following characteristics

- Produced from first grade ball bearing steel
- Tempered
- Highly polished

Standard ring dimensions and fixations

Fixing

Depending on spinning machine type. Most popular long staple ring spinning machines: Zinser and Cognetex

Quality

The tolerances of all rings are tighter than the requested values listed in the ISO Standard 96.

Ring dimensions

General rules:
Fitting- ϕ = Inner- ϕ + 7mm (less than 7mm not possible)
Outer- ϕ = Inner- ϕ + 8.5 mm
Other dimensions on request



Bräcker supplies also complete ring rails (as above). Please ask for quotation.

Main conical ring dimensions

Height	Ring diameters			Outer	Spinning frame		Fixing
	Inner	Fitting	Outer		Cognetex	Zinser	
9.1	45	52	52.9	Cognetex	Force fit		
9.1	48	55	56.5				
11.1	48	55	56.5				
11.1	51	58	59.5				
11.1	55	62	63.5				
11.1	60	67	68.5	Zinser	Force fit		
11.1	65	72	73.5				
9.1	45	52	53.5				
11.1	45	52	53.5				
11.1	48	55	56.5				
11.1	50	57	58.5				
11.1	51	58	59.5				
11.1	54	61	62.5				
11.1	55	62	63.5				
11.1	56	63	64.5				
11.1	58	65	66.5				
11.1	60	67	68.5				

Ring fixing system

- Depending on the existing ring rails
- On request supply of complete ring rails with integrated lubrication channel

Standard lubricating system

- A wick is "transporting" the oil from the ring rail to the ring
- The external wick is "feeding" the oil to the internal wicks which lubricate the traveller running track
- Lubricant: synthetic or mineral oil
- Viscosity ISO VG 32
Steel travellers 32
NYLTEx travellers 32 - 46

SU ring and traveller system

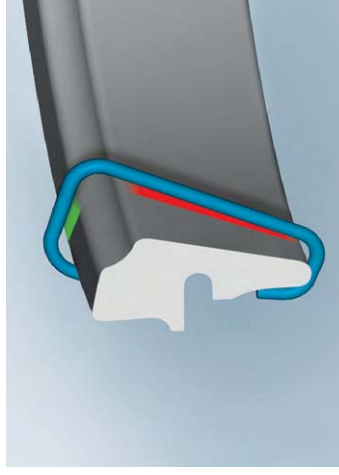
Influence of the traveller shape and its contact on the ring

Conical rings have straight or convex raceways.

In order to obtain the optimum contact ring/traveller during running, the right ring/traveller combination must be selected:

- Raceway **straight** → Traveller back **convex**
- Raceway **convex** → Traveller back **straight**

Example:



contact
no contact

Acrylic yarns can also be processed on SU-rings, with an oblique flange and special shaped SU steel travellers. For this system no additional lubricants need to be applied.

For synthetics and their blends

The SU ring/traveller system is suitable for the processing of synthetics (PAC, CV, PES) and fibre blends (pre-condition is, however, a significant proportion of synthetics) in the medium to coarse yarn count range. In some cases where conical, lubricated rings are in use, they can be replaced by the SU ring / traveller system.

The design features:

- Large contact area between ring and traveller reduces the specific pressure
- Optimum heat dissipation traveller to ring

The advantages:

- No lubrication required (as against conical rings; not suitable for pure wool)
- Consistent yarn tension, therefore better and more even yarn quality
- No thermal fibre damages
- Increased life cycle of travellers and rings
- Higher spindle speeds
- Lower yarn breakage rate
- No yarn stain

Traveller finish

The following finishes are available:



SAPHIR (diffusion finish)
for all kind of fibres



STARLET (special nickel plating)
for fibres with special softening agent and when working in aggressive environment

Travellers for SU rings

Type	Shape	Wire section	ISO No.	Applications	№
SU-B		dth ●	31.5 - 400	Acrylics Polyester	12 - 36
SU-B		r ●	35.5 - 280	Acrylics	10 - 24*
SU-BM		dth ●	35.5 - 280	Acrylics Polyester Viscose	20 - 50
SU-BF		udr —	28 - 90	Viscose	28 - 50

* for fibres with strong fibre finish



Traveller inserting tool

Easy and economic traveller change with the well proven Bräcker STRAP SU travellers and the RAPID inserting tool.

Setting of traveller cleaner

Fibres can accumulate and wrap on the exterior side of the traveller, depending on the type of fibre. This can be avoided to a great extent with the traveller cleaner developed by Bräcker. The setting must be made respective of the traveller profile and weight used.



Traveller No ISO	"b"
< ISO 63	1,7 mm
ISO 56 - 112	1,9 mm
> ISO 100	2,1 mm

SU rings
The foot of the SU ring is designed with a supporting area to prevent unthreading of the yarn during the doff process. For certain ring spinning machines an additional supporting ring is compulsory.

Ring dimensions

- Inner diameter 42 mm to 45 mm (48 mm, 51 mm and 54 mm are also possible)
- Seating diameter depending on existing ring rail

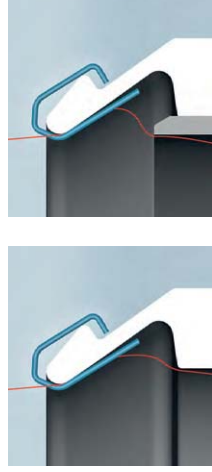
Ring finish

The well proven Bräcker TITAN finish is standard for all applications. Other finishes on request only.

Application

Traveller weights (in mg, SU travellers have no „numbers“).

The recommended weight depends on various factors such as spinning geometry, spinning speed, fibre softening agent etc. The final traveller weight should be selected through trials.



SU ring with supporting area and additional supporting ring

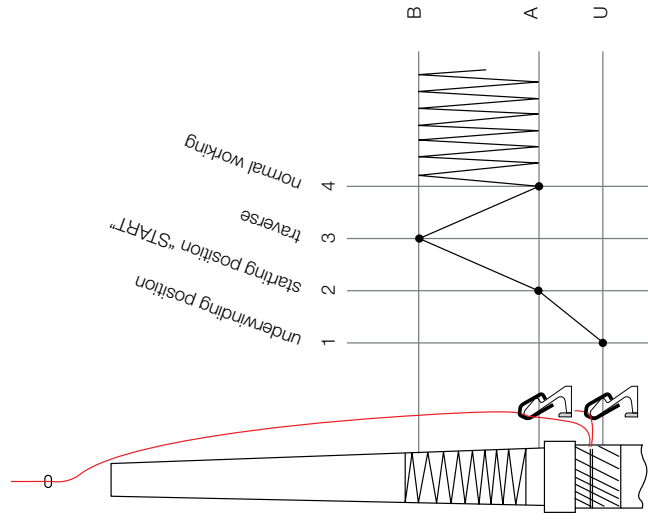
Starting procedure after doffing

Function of support area and the support ring

The supporting area, respectively the supporting ring, prevent slip-off of the yarn during any movements of the ring rail while the spindles are not running and hence, the yarn is not under permanent tension.

Recommended starting procedure

General: start spindle whenever possible as soon as the traveller is on the lowest winding position on the spinning tube.



B = traverse

A = starting position

U = undwinding position for spinning (spindel start)

Tex	Nm	Ne	SU	
			PES	PAC and CV
100	10	6	250	315
72	14	8	250	280
59	17	10	224	200
50	20	12	200	160
42	24	14	160	140
36	27	16	125	112
30	34	20	80	80
25	40	24	80	71
20	50	30	63	63
17	60	36	56	50
15	68	40	56	45
12	85	50	50	40
10	100	60	40	40

Wet flax/ linen spinning

We distinguish in the linen spinning, between dry- and wet-processed yarns. Longer staple fibres are mostly wet spun, while shorter fibres run through a different process and are dry-spun. The wet spinning process is made on rust-resistant flange rings and NYLTEX travellers.

NYLTEX travellers F-series

Wet flax spinning requires non corrosive travellers. Bräcker NYLTEX F-series travellers with special design are the solution for this special application. All NYLTEX travellers for wet flax spinning are glassfibre reinforced.

Application of NYLTEX travellers on flax spinning

The traveller numbers given are approximative. The exact number can only be determined through tests.



F12

Wet flax spinning for S and Z twist

For medium to fine range of traveller weights

FZ

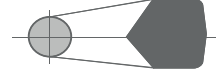
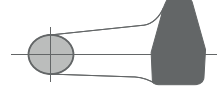
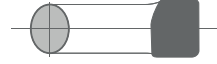
Wet flax spinning for Z twist only, dry spinning is also possible

For higher traveller speeds and finer yarn counts

FU

Wet flax spinning for S and Z twist, dry possible

For heavier traveller weights



Tex	Nm	NeL	Traveller ISO No	
			Wet	Dry
280	3.6	6		710 - 800
200	5	8		560 - 630
170	6	10		450 - 560
140	7	12		355 - 400
125	8	13	560 - 630	250 - 315
100	10	16	450 - 500	200 - 250
84	12	20	355 - 400	180 - 200
72	14	23	280 - 315	160 - 180
64	16	27	250 - 280	140 - 160
50	20	33	200 - 224	112 - 125
42	24	40	160 - 180	90 - 100
33	30	50	140 - 160	80 - 90
30	34	57	125 - 140	71 - 80
25	40	67	112 - 125	
20	50	83	100 - 112	
17	60	100	80 - 90	
12.5	80	135	63 - 71	

NYLTEX travellers F-series are produced in the ISO number range from 63 to 800. Other numbers on request.

TRITON - the F-series T-flange spinning ring

The corresponding weights and colours see below.

F-series travellers

ISO No	Colour	ISO No	Colour	ISO No	Colour
		100	gray	1'000	orange
		112	purple	1'120	red
		125	turquoise	1'250	purple
		140	yellow	1'400	green
		160	red	1'600	azure
		180	blue	1'800	yellow
		200	orange	2'000	turquoise
		224	gray		
		250	dark brown		
		280	green		
		315	yellow		
		355	azure		
		400	red		
45	orange	450	orange		
50	purple	500	purple		
56	turquoise	560	turquoise		
63	red	630	blue		
71	dark blue	710	yellow		
80	green	800	gray		
90	yellow	900	dark brown		

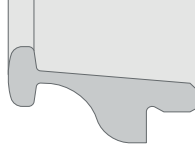
TRITON rings are specially designed for the wet spinning of flax fibres over the full yarn count range. The TRITON surface coating combines abrasion and chemical wear resistance. The coating features the following advantages:

- Smooth and even surface properties thus low end down rate, long traveller life and excellent yarn quality
- High wear resistance against abrasion
- Long ring service life
- Favourable price/performance ratio

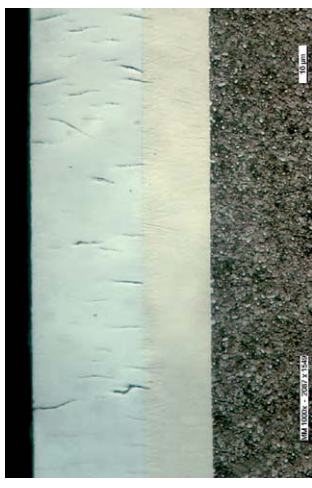
The TRITON ring replaces the conventional stainless steel (INOX) rings and can be supplied in the most used dimensions.

TRITON rings with flange 4.4 mm

Shape A (Standard)

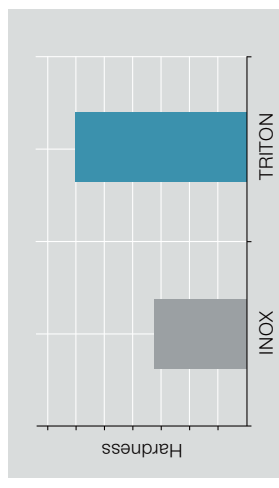


Shape B (on request)



High resistance TRITON layer

Hardness comparison INOX vs. TRITON



Twisting

The twisting process is usually carried out on vertical HZ sinter metal rings and NYLTEX and STEELTEX travellers, since mostly heavier counts are processed. Only finer counts are twisted with steel travellers.

General twisting

For twisting, carpet yarn spinning and draw-twisting

Polyamid (NYLON) has a higher coefficient of friction than steel. This means NYLTEX and STEELTEX travellers can create sufficient yarn tension with lower traveller weight.

Advantages of NYLON travellers

- less load and wear on spinning rings
- higher speeds and longer traveller life
- easy inserting and removing of heavy travellers

NYLTEX produced from recycle-free compounds

Bräcker uses only first grade compounds for the production of NYLTEX and STEELTEX travellers.

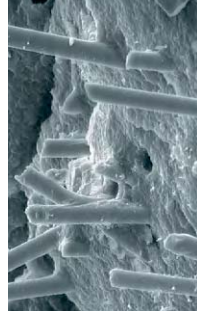
The following two qualities are in use:

Lubridur

- Fine structured compound for increased gliding properties
- This quality is in use for twists with normal abrasion tendency and for twisting and doubling of delicate yarns

“R” reinforced

- Compound reinforced with glass fibres
- The higher stiffness of this material prevents pull-off of the travellers at start (mainly with light travellers)
- The wear resistance against abrasive yarns is increased



„R“ reinforced

STEELTEX travellers with metal insert for optimal wear resistance



- The extra hard metal insert in the yarn path features an outstanding wear resistance
- Prevention of filament damages
- Extended traveller life when twisting or doubling abrasive yarns or filaments
- Guarantees perfect yarn quality over an extremely long traveller life
- Mainly used in carpet yarn spinning, draw-twisting and for expensive special yarns and filaments
- For draw twisting see page 28



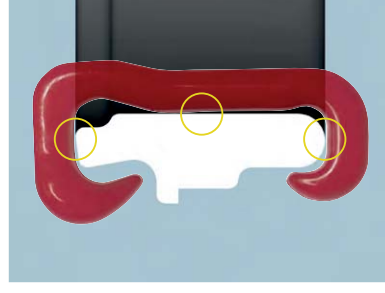
General twisting, inclusive carpet yarn production is usually processed on lubricated sinter metal rings HZ 9.5 - HZ 38.1, using NYLTEX and STEELTEX travellers.

Recommended traveller weights - Twisting

Yarn count			NYLTEX / STEELTEX ISO No*			
Tex	Nm	Ne	2 ply	3 ply	4 ply	6 ply
3300	0.3	0.18	18000 - 20000			
2500	0.4	0.24	12500 - 16000			
1650	0.6	0.35	10000 - 11200			
1250	0.8	0.47	8000 - 9000	12500 - 14000		
1000	1	0.6	6300 - 7100	10000 - 11200		
840	1.2	0.7	5600 - 6300	8000 - 9000		
710	1.4	0.8	4500 - 5000	6300 - 7100	9000 - 10000	
590	1.7	1	3550 - 4000	5000 - 5600	7100 - 8000	
500	2	1.2	2500 - 3150	4000 - 4500	5600 - 6300	11200 - 12500
400	2.5	1.48	1800 - 2240	3150 - 3550	4500 - 5000	9000 - 10000
330	3	1.8	1250 - 1600	2500 - 2800	3550 - 4000	8000 - 9000
250	4	2.4	1000 - 1120	1800 - 2240	2800 - 3150	6300 - 7100
165	6	3.6	800 - 900	1250 - 1600	2000 - 2500	4500 - 5600
125	8	4.8	630 - 710	900 - 1120	1600 - 1800	3150 - 4000
100	10	5.9	500 - 560	710 - 800	1120 - 1400	2240 - 2800
84	12	7	400 - 450	560 - 630	800 - 1000	1400 - 2000
71	14	8.3	315 - 355	450 - 500	630 - 710	1120 - 1250
63	16	9.4	250 - 280	355 - 400	500 - 560	900 - 1000
56	18	10.5	200 - 224	280 - 315	400 - 450	800 - 900
42	24	14	160 - 180	224 - 250	315 - 355	710 - 800
36	28	16	125 - 140	180 - 200	250 - 280	560 - 630
30	34	20	112 - 125	140 - 160	200 - 224	450 - 500
25	40	24	100 - 112	112 - 125	160 - 180	355 - 400
20	50	30	90 - 100	100 - 112	125 - 140	280 - 315
18	54	33	80 - 90	90 - 100		
16	60	36	71 - 80	80 - 90		
14	70	42	63 - 71	63 - 71		
12	85	49	50 - 63			
10	100	59	40 - 50			

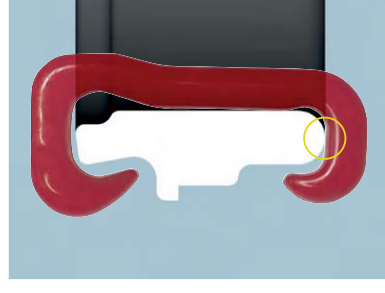
Selection of the correct NYLTEX traveller weight (HZ-travellers)

correct weight



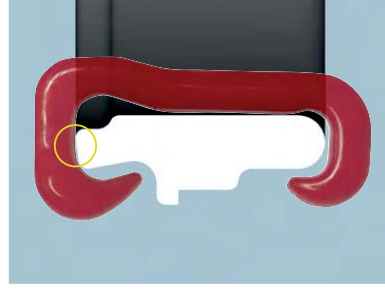
Uniform wear along vertical back, head and foot

too heavy



Excessive wear on foot tension is too high

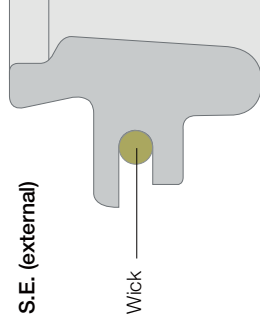
too light



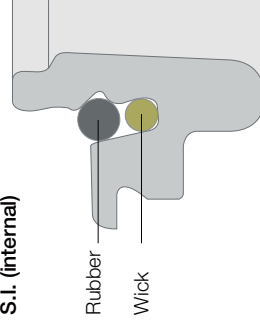
Excessive wear on head tension is too low

Lubrication

Before use, the sintered metal rings must be impregnated. The regular oil supply comes from a tank, integrated in the ring holder, transported by a wick surrounding the ring. There are two lubricating systems:

S.E. (external)

Wick

S.I. (internal)

Rubber

Wick

Installation

Sintered metal rings are impregnated and packed individually in plastic bags. Remove the rings just before mounting in the ring holders. Do not wipe the oil, nor use any solvent. Fill up the lubrication reservoir with oil and wait 12 to 24 hours before starting.

Running-in

Since NYLTEX or STEELTEX travellers are on sintered metal rings in use, no special running-in procedure is required. However, check the following points:

- Use the regular traveller weight
- Make the first traveller change after two doffs and check the traveller wear (wear pattern and wear rate).
 - If normal values are reached, go to normal schedule.
 - If wear pattern is abnormal, check oil flow or change traveller weight
- Check oil flow after 24 and 48 hours:
 - When too much oil is noted, increase oil viscosity
 - If not enough is protruding, reduce oil viscosity

Maintenance

Depending on the working conditions, sintered metal rings must be re-impregnated. It is recommended when unusual traveller wear or uneven yarn tension is noticed. Impregnation by warm oil (most popular method):

- Remove the old wicks and clean the rings from visible dirt
- Immerse the rings in a tank with warm oil (90°C to 110°C).
 - Present air in the pores, oil and residues are pressed out (overpressure)
- Cool down to room temperature
- Change oil
- Heat oil and rings to 90°C to 110°C
 - The old oil and remaining residues are pressed out
- Cool down to room temperature
 - The pores are refilled with fresh oil
 - The rings are ready for re-wicking (special instruction brochure is available on request)

Whenever possible, use S. E. system (more flexibility in diameter but depends also on the ring holder).

Draw twisting

The classical draw-twisting with rings and travellers is the subsequent process after the spinning of PA and PES filaments to give them the necessary orientation and strength for further processings. The bundle of filaments gets fixed and some minimal twists before unwinding on bobbins. The draw-twisting is processed on vertical sinter metal rings and steel or STEELTEX travellers.

Draw twisting of filaments requires special treatment of the travellers yarn path. Through the high delivery speeds due to low twist, abrasion in the yarn path is increased. To prevent filament breaks, Bräcker recommends to use the following special travellers.

STEELTEX

For coarser twists only



- STEELTEX travellers with extra hard steel inserts
- guaranteed extended traveller operating time

Traveller delivery program for draw twisting

HZ ring height	STEELTEX travellers
9.5 / 3/8"	ISO 50 to 500
10.3 / 13/32"	ISO 112 to 315
11.1 / 7/16"	ISO 80 to 500

Glass filament twisting

Single twisted yarns, coming directly from the spinning or single and multiplied twist process, for the down stream processes such as weaving, knitting or coating.

Delivery program



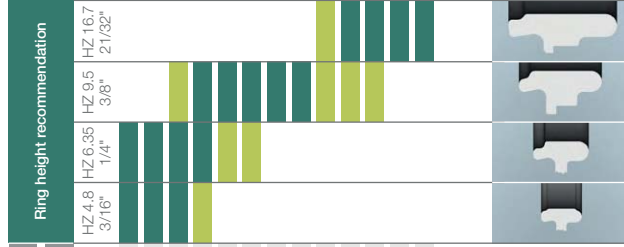
HZ 4.8 3 / 16" CLB ISO No.	HZ 6.35 1 / 4" CLB ISO No.	HZ 6.35 1 / 4" CLB / W ISO No.	HZ 9.5 3 / 8" CLB ISO No.	HZ 9.5 3 / 8" CLB / W ISO No.	HZ 9.5 3 / 8" CE ISO No.	HZ 16.7 21 / 32" CE ISO No.	Corresp. American No.
10						80	12
12.5	12.5					90	14
16	16					100	16
18	18					112	18
20	20					125	20
22.4	22.4					140	22
25	25					160	25
28	28					180	28
31.5	31.5					200	31
35.5	35.5					224	35
						250	38
40			40			280	42
45			42/45			315	48
50		50	50			365	55
56		56	56			400	62
		63	63			450	70
		71	71	71		500	77
		80	80	80		520	80
		90	90	90		560	86
		100	100	100		630	97
		112	112	112		710	110
		125	125	125		800	125
		140	140	140		900	138
		160	160	160		1000	155
		180	180	180		1120	173
		200	200	200		1250	193
		224	224	224		1400	216
		250	250	250		1600	248
						1800	278
						2000	310
			355			2240	346
						2500	386
						3150	486

Glass filament twists are usually processed on lubricated vertical sinter metal rings HZ 4.8 - HZ 16.7, using exclusively NYLTEX travellers.

For traveller weights not in the table above, please contact your local agent or Bräcker American No: the traveller weight indicates the weight of 10 travellers in grams (1 grain = 64.8 mg)

Application of NYLTEX travellers for glass filament twisting

Metric system		US customary system		Traveller weight	
Tex	Microns	Yield	Yarn count	ISO**	Grains***
	µm	Filament size	h.y.p.p.*		
2,75	5	D	1800	10 - 14	1.5 - 2
5,5	5	D	900	16 - 25	2.5 - 3
11	5	D	450	35.5 - 45	5 - 7
22	6	DE	225	40 - 56	6 - 9
33	6	DE	150	63 - 80	10 - 12
45	6	DE	110	90 - 125	14 - 20
50	6	DE	100	100 - 140	15 - 22
66	9	G	75	160 - 250	25 - 38
90	9	G	55	224 - 315	34 - 48
99	9	G	50	280 - 450	43 - 70
134	9	G	37	315 - 500	49 - 78
198	11	H	25	500 - 800	78 - 125
275	13	K	18	800 - 1250	125 - 200



recommended
possible

Note:

The recommended traveller weights are guiding values.
The final traveller weight should be selected through trials.

- * h.y.p.p hundred yards per pound
- ** ISO No Weight of 1'000 travellers in grams
- *** American No in grains / 10 travellers (1 grain = 64.8 mg)

Conversion Metric to h.y.p.p: 4961 / tex
Conversion h.y.p.p to metric: 4961 / h.y.p.p.

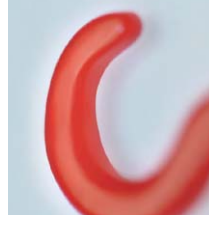
NYLTEX travellers and sinter metal rings for glass filament twisting

NYLTEX traveller quality

Bräcker produces the travellers from first grade compounds.

Do not use glass fibre reinforced NYLTEX travellers for glass twisting!

- The seam in the yarn path is reduced to the lowest possible grade. This prevents damages on the glass filaments.
- Bräcker NYLTEX travellers are manufactured in accordance with the International Standard ISO 96-2.
- The weight increases from number to number by 12.5%
- The traveller weight tolerance is 0 up to 5%



Seamless yarn path

Rings for glass filament twisting

Rings produced from porous sinter metal are in use for glass filament twisting. The continuous oil flow assures an even twisting tension over the full bobbin filling.

Lubricating systems S. I. and S. E. are available for sinter metal rings. In order to avoid any soiling of the produced yarn, the S. I. system is recommended.

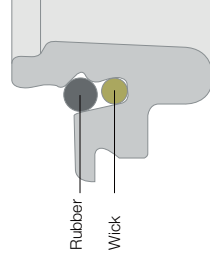
Bräcker supplies sinter metal rings for ring heights 4.8 to 16.7 mm in all the common dimensions.



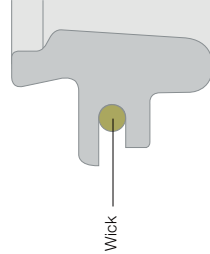
Sinter metal ring with individual holder



Structure of sinter metal



S. I. lubricating system (internal wick)



S. E. lubricating system (external wick)

Glass filament quality control

The quality control described below is normally done visually on full spools in backlight. This kind of checking shows only faults on the surface, therefore it is recommended to do also tests on full spools (unwinding) or using quality data from downstream processes. Control parameters are not standardized.

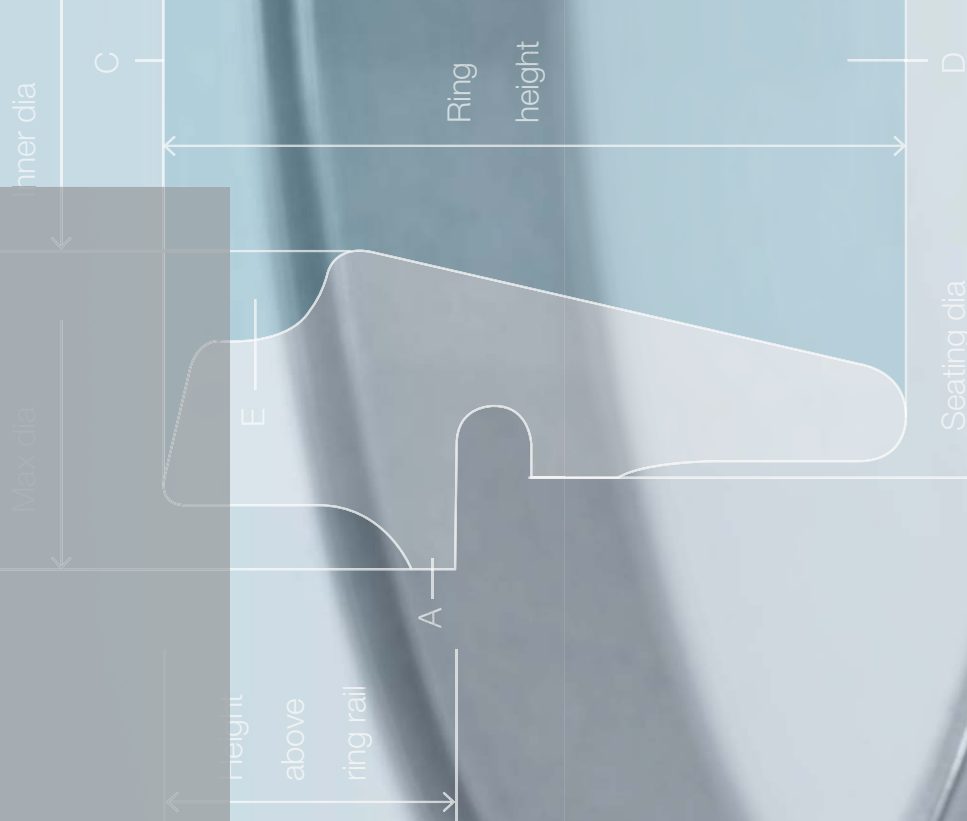
The following parameters are checked by the glassfibre twists producer:

Hairiness
Number of filament breaks

Loop
Unwinding problems (curling twist)

Protruding fibres
Accumulation of fibres (soiling)

General technical information



Numbering of yarns and twists

Given	Desired	Abbreviation	den	tex	dtex	Nm	Ne _B	Ne _L	Ne _w	Ne _k
Tex		tex	9 tex	-	10 tex	$\frac{1000}{dtex}$	$\frac{590}{dtex}$	$\frac{1654}{dtex}$	$\frac{1938}{dtex}$	$\frac{886}{dtex}$
Decitex		dtex	0,9 tex	0,1 dtex	-	$\frac{10000}{dtex}$	$\frac{5900}{dtex}$	$\frac{16540}{dtex}$	$\frac{19380}{dtex}$	$\frac{8860}{dtex}$
Den		den	-	0,111 den	1,111 den	$\frac{9000}{den}$	$\frac{5315}{den}$	$\frac{14882}{den}$	$\frac{17440}{den}$	$\frac{7972}{den}$
Metric no		Nm	$\frac{9000}{Nm}$	$\frac{1000}{Nm}$	$\frac{10000}{Nm}$	-	0,590 Nm	1,654 Nm	1,938 Nm	0,886 Nm
Engl. cotton no		Ne _B	$\frac{5315}{Ne_B}$	$\frac{590}{Ne_B}$	$\frac{5900}{Ne_B}$	1,683 Ne _B	-	2,80 Ne _B	3,28 Ne _B	1,5 Ne _B
Engl. linen no		Ne _L	$\frac{14882}{Ne_L}$	$\frac{1654}{Ne_L}$	$\frac{16540}{Ne_L}$	0,605 Ne _L	0,357 Ne _L	-	1,172 Ne _L	0,536 Ne _L
Engl. woolen no		Ne _w	$\frac{17440}{Ne_w}$	$\frac{1938}{Ne_w}$	$\frac{19380}{Ne_w}$	0,516 Ne _w	0,305 Ne _w	0,853 Ne _w	-	0,457 Ne _w
Engl. comb. no		Ne _k	$\frac{7972}{Ne_k}$	$\frac{886}{Ne_k}$	$\frac{8860}{Ne_k}$	1,129 Ne _k	0,667 Ne _k	1,867 Ne _k	2,188 Ne _k	-

Steel traveller numbers and weights - comparison chart

Traveller no	Bräcker		R + F		KANAI		CARTER	
	europ. ISO	americ. HZ 9,5 3/8"	HZ + J	HZ-EN europ.	HZ-AN HZ 9,5 am. 3/8"	SB 6 HZ 9,5	SB 17 J 11,1	9,5 mm 3/8" 11,1 mm 7/16"
19	250	140	255	255	136	185	210	152 180
19 1/2	224		220					
20	180	100	185	170	104	130	180	108 130
20 1/2	(170)		165			165		
21	160	80	150	141	84	110	150	89 105
21 1/2	140		140			143		
22	125	63	130	123	65	87,5	135	73 82
22 1/2	(118)		120			128		
23	112	56	110	117	53	71,3	120	59 68
23 1/2	100		100			113		
24	90	45	92	94	42	58,3	105	45 55
24 1/2	80		83			98		
25	71	35,5	75	75	36	45,4	90	35,5 42,5
25 1/2	(67)		67			83		
26	63	31,5	60	62	30	38,9	75	28 34
26 1/2	56		53			72		
27	50	25	48	49	25	32,4	68	25,5 30
27 1/2	45		44			65		
28	40	20	39	39	19	25,9	61	22 26
28 1/2	35,5		36			58		
29	31,5	16	33	32	16,2	22,7	54	18,5 22,5
29 1/2	(30)		31			51		
30	28	12,5	29	28	13	19,4	47	16 19
31	25	10,8	26	24	11,3	17,5	40	13,5 16
32	22,4	9	24	21	9,7	14,9	36	
34	20		21	17	7,7		28	
36	18		18	14			20	
38	14		15	12				

Bräcker NYLTEX travellers are numbered in the ISO system only!

Valid for J and HZ steel travellers up to ring height of 17.4 mm.
The ISO number is the weight of 1'000 travellers in grams, respectively of 1 traveller in milligrams.
The ISO number guarantees an even percental grading: 100 + 12.5 % + 12.5 % + 12.5 % etc.

Traveller speeds - Spinning

Ring Ø	Spindle speed n / min																														
	mm	inch, 1/8"	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500	11000	11500	12000	12500	13000	13500	14000	14500	15000	15500	16000	16500	17000
216	8 1/2	33	39	45	50	56	62																								
200	8	31	36	41	47	52	57	62																							
190	7 1/2	29	34	39	44	49	54	59	64																						
180	7	28	32	37	42	47	51	56	61	65																					
165	6 1/2	25	30	34	38	43	47	51	56	60	64																				
140	5 1/2	21	25	29	32	36	40	43	47	51	54	58	62																		
125	5	19	22	26	29	32	35	39	42	45	49	52	55	58	62																
115	4 1/2	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63														
100	4	15	18	20	23	26	28	31	34	36	39	41	44	47	49	52	54	57	60												
90	3 1/4	14	16	18	21	23	25	28	30	32	35	37	40	42	44	47	49	51	54	56	58										
80	3 1/8	14	16	18	20	23	25	27	29	31	33	35	37	39	41	43	46	48	50	52	54	56	58								
75	3	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	52	54	56	58							
70	2 3/4	14	16	18	20	21	23	25	27	29	31	32	34	36	38	40	42	43	45	47	49	51	52	54	56	58					
67	2 5/8	15	17	19	21	22	24	26	28	29	31	33	35	36	38	40	42	43	45	47	49	50	52	54	56	57	59				
63	2 1/2	16	18	19	21	23	24	26	28	29	31	32	34	36	37	39	41	42	44	46	47	49	51	52	54	56	58				
60	2 3/8	15	17	18	20	21	23	25	26	28	29	31	32	34	36	37	39	40	42	43	45	47	48	50	51	53					
57	2 1/4	16	17	19	20	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	46	47	49	50						
54	2 1/8	16	18	19	21	22	24	25	26	28	29	31	32	33	35	36	38	39	40	42	43	45	46	48							
51	2	17	18	20	21	22	24	25	26	28	29	30	32	33	34	36	37	38	40	41	42	44	45								
48	1 7/8	16	17	18	20	21	22	23	25	26	27	28	30	31	32	33	35	36	37	38	40	41	42								
45	1 3/4	16	17	18	20	21	22	23	24	25	27	28	29	30	31	32	34	35	36	37	38	40	41	42							
42	1 5/8	16	17	18	19	20	21	23	24	25	26	27	28	29	30	31	32	34	35	36	37	38	40	41	42						
40	1 9/16	16	17	18	19	20	21	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	40	41	42					

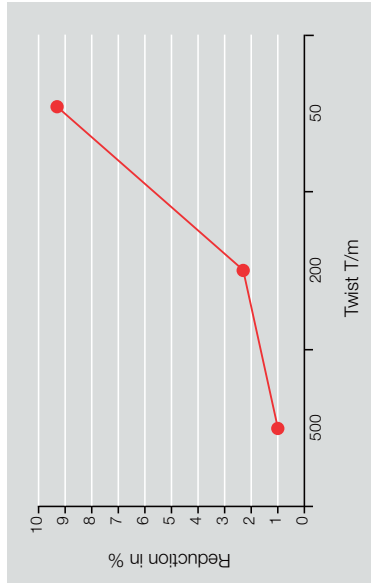
Traveller speed in m / s (rounded figures)

Formulas

Traveller speed in m/s $V_t = \frac{d \times \pi \times n}{60 \times 1'000}$
 Traveller speed in m/s $V_t = \frac{d \times \pi \times n}{60 \times 1'000}$
 Spindle speed in n/min $n = \frac{V_t \times 60 \times 1'000}{D \times \pi}$
 Spindle speed in rpm $n = \frac{V_t \times 60 \times 1'000}{D \times \pi}$

V_t = Traveller speed in m/s
 d = Ring diameter in mm
 π = Pi, 3.14 mm
 n = Spindle speed (rpm)

Traveller speeds - Twisting

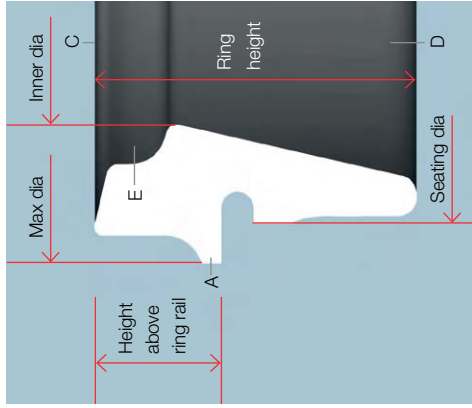


Traveller speed reduction in % of the calculated speed

With low twist rates, the effective traveller speed is remarkably reduced from the calculated speed.

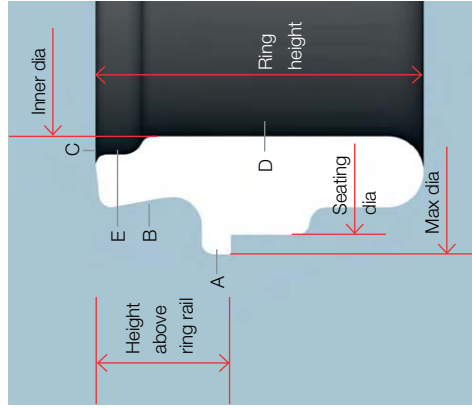
Designations of ring parts

Conical Ring (J)




- A Shoulder
- B Upper running surface
- C Inner running surface
- D Inner running surface
- E Yarn recess

Vertical Ring (HZ)



- A Shoulder
- B Back slope feature for better nylon travellers grip
- C Upper running surface
- D Inner running surface
- E Yarn recess

Bräcker short cuts of steel traveller parts

B	B Back	Convex traveller back for conical rings with straight inner raceway	
BS	Back Slope	Traveller head shape, specially designed for the use on HZ-BS rings	
CST	CST heel	The CST bow on the lower, inner traveller part prevents contact to the lower ring radius. Better start up and running, specially when the rings are scratched when heavy travellers are inserted.	
KST	KST head	Conical travellers with wide yarn path for voluminous and coarse yarns	
Express	Express toe	The bent traveller toe prevents damage on sinter rings while travellers are inserted	
RP	Head shape	HZ traveller with optimized head shape and enlarged yarn path	
RST	Head shape	HZ traveller with special yarn path for man made fibres and filaments	

Yarn types, twists – application overview

Fibre Yarn	Ring Type	Ring Shape	Traveller Type	Traveller Material
Wool worsted Acrylic	Steel Ring	Conical	J 9.1 to 17.4	Steel / NYLTEX
			J 11.1 to 17.4	Steel / NYLTEX
Chenille	Steel Ring	SU	SU	Steel
Acrylic	Steel Ring	F-Series	F2, FZ (FU)	NYLTEX
Flax (Linen)	Steel Ring		HZ 10.3 to 16.7	Steel / NYLTEX
Woolen	Steel Ring		HZ 4.8 to 16.7	NYLTEX
Glass filament			HZ 16.7 to 25.4	NYLTEX / STEELTEX
Carpet yarn			HZ 16.7	
Tyre cord	Sintered Metal	HZ (vertical)	HZ 16.7 to 38.1	NYLTEX
Twist 2 ply to 6 ply			HZ 25.4 to 38.1	
Fish net			HZ 9.5 to 16.7	Steel STEELTEX
Draw twisting				

Running-in of solid steel and sintered rings

Instruction is supplied with every ring order confirmation and ring shipment.

General

- A ring running-in must only be carried out when steel travellers are used. It does not apply when NYLTEX/STEELTEX travellers are used. However it has to be done subsequently, should steel travellers be used later on.

Preparation

- After installation in the ring rails, the rings must be cleaned with an oily cloth from the rust protection oil (do not use solvents).
- Do not cut off or remove the slightly protruding wicks (steel rings). These will be cut off from the travellers during the first rotations.
- Select the oil type according to the application
- Fill up the lubrication channels with oil and wait 12 to 24 hours before starting.

Yarn type, traveller weight

- Use insensitive, dark coloured yarns since oil splashes are unavoidable during the running-in phase.
- Use the normal traveller weight

Starting procedure

- Before the first run-in, oil all the rings by hand to guarantee a full lubrication film.

Running-in

The following running-in program is set out for normal conditions. In case of stronger traveller wear and tear, the changing intervals have to be adjusted accordingly.

Running-in

Spindle speed	Nm 20 and coarser		Nm 20 and finer		Ring cleaning
	Traveller change after	Nm 20 and finer	Traveller change after	Nm 20 and finer	
80 %	1 hour	1 hour	1 hour	1 hour	yes
	1 doff	1 doff	1 doff	1 doff	
	3 doffs	2 doffs	2 doffs	2 doffs	
	8 doffs	6 doffs	6 doffs	6 doffs	
90 %	1 doff	1 doff	1 doff	1 doff	yes
	3 doffs	2 doffs	2 doffs	2 doffs	
	8 doffs	6 doffs	6 doffs	6 doffs	
	16 doffs	12 doffs	12 doffs	12 doffs	
100%	1 doff	1 doff	1 doff	1 doff	yes
	3 doffs	2 doffs	2 doffs	2 doffs	
	8 doffs	6 doffs	6 doffs	6 doffs	
	16 doffs	12 doffs	12 doffs	12 doffs	

Maintenance

Checking of oil flow through the wicks. If necessary, re-wicking has to be considered.

Lubricants for self-lubricating rings

The lubricants are classified according to ISO viscosity grades (VG):

- Low viscosity highly fluid e.g. ISO VG 15
- High viscosity semi fluid e.g. ISO VG 68

The lubricants have to be adapted to the application. Check details with the suppliers.

Application recommendation (guiding values)

Rings made of steel

Traveller type	Viscosity ISO VG
Steel	32
NYLTEX / STEELTEX	32 / 46

Sintered metal rings

Ring height	4,8 - 11,1	16,7-38,1
Traveller type	Viscosity ISO VG	
Steel	15 / 32	15 / 32
NYLTEX / STEELTEX	23 / 46	48 / 68

Suppliers of lubricants (incomplete selection)

Lubricants Suppliers	Synthetic oils / Viscosity ISO VG			
	15	22	46	68
BP			Enerissyn RC-S 46	Enerissyn RC-S 68
Fuchs	Pantolube Polar 15 S	Pantolube Polar 22 S		Plantohyd 68 S
Klüber	Syntheso XOL 12			
Mobil			Mobil SHC 626	Mobil SHC 26
Texaco	Rando Oil HDZ 15		Hydra 46	Hydra 68
Zeller + Gmelin	Textol RLS ISO 15	Textol RLS ISO 22	Textol RLS ISO 46	Textol RLS ISO 68

Lubricants Suppliers	Mineral oils / Viscosity ISO VG		
	32	46	68
BP	Energol HLP - HM 32	Energol HLP - HM 46	Energol HLP - HM 68
Esso	Tereso 32, Nuto 32, Nuto H 32	Tereso 46, Nuto 32, Nuto H 46	Tereso 68, Nuto 32, Nuto H 68
Fuchs	Renolin B 10 VG 32	Renolin B 15 VG 46	Renolin B 20 VG 68
Klüber	Lamora HLP 32	Lamora HLP 46	Lamora HLP 68
Mobil	Mobil DTE 24	Mobil DTE 25	Mobil DTE 26
Shell	Tellus Oil 32, Vexilla Oil 32	Tellus Oil 46, Vexilla Oil 46	Tellus Oil 68, Vexilla Oil 68
Texaco	Rando HD 32, Alcor DD 32	Rando HD 46, Alcor DD 46	Rando HD 68, Alcor DD 68
Zeller + Gmelin	Textol RLA ISO 32	Textol RLA ISO 46	Textol RLA ISO 68

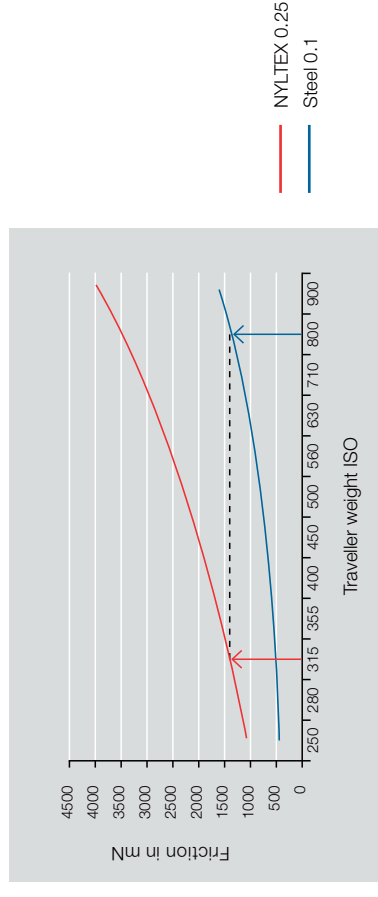
NYLTEX and STEELTEX travellers
Advantages of NYLTEX travellers compared to steel travellers

Coefficient of friction

NYLTEX travellers have, compared to steel travellers a 2 to 3 time higher coefficient of friction, this means, a NYLTEX traveller creates with a lower weight sufficient spinning / twisting tension. This bears the following advantages:

- Lower ring load (specially when processing heavy counts)
- Easier inserting and removing of travellers
- Higher traveller speeds
- Less ring wear
- Smoother traveller running and hence, better yarn quality and low end-down rates.

Example coefficient of friction



A NYLTEX traveller with a weight of 315 mg creates the same friction as a steel traveller of 800 mg (the coefficient of friction in practice may vary due to lubrication, environment etc).

Steel travellers can be replaced by NYLTEX travellers, using a nylon traveller weight of approx. 40% - 50% of steel traveller weight.

NYLTEX and STEELTEX travellers are coloured in order to prevent mix-up.
The corresponding weights and colours see below.

HZ- and J-travellers

ISO No	Colour	ISO No	Colour	ISO No	Colour	ISO No	Colour
10	orange	100	yellow	1'000	blue	10'000	orange
12.5	red	112	orange	1'120	yellow	11'200	blue
14	azure	125	red	1'250	red	12'500	red
16	brown	140	turquoise	1'400	turquoise	14'000	blue
18	purple	160	brown	1'600	purple	16'000	yellow
20	yellow	180	purple	1'800	green	18'000	dark brown
22.4	green	224	green	2'240	orange	20'000	green
25	red	250	dark blue	2'500	dark blue		
28	azure	280	natural	2'800	azure		
31.5	brown	315	dark brown	3'150	purple		
35.5	turquoise	355	blue	3'550	blue		
40	green	400	yellow	4'000	dark brown		
45	orange	450	orange	4'500	yellow		
50	scarlet	500	red	5'000	orange		
56	yellow	560	brown	5'600	red		
63	azure	630	orange	6'300	turquoise		
71	purple	710	scarlet	7'100	brown		
80	dark brown	800	natural	8'000	purple		
90	blue	900	purple	9'000	green		

**Correlation table yarn counts –
traveller weights for vertical- and conical ring systems**

Yarn count		TYPE HZ vertical ISO No	TYPE J, conical ISO No
Tex	Nm		
10000	0.1	18000 - 20000	
5000	0.2	14000 - 16000	4000 - 5000
3300	0.3	10000 - 14000	3150 - 4000
2500	0.4	8000 - 11200	2800 - 3150
1650	0.6	5000 - 10000	2500 - 2800
1250	0.8	3550 - 6300	2000 - 2240
1000	1	2240 - 3150	1400 - 1800
840	1.2	1600 - 2000	1000 - 1400
710	1.4	1250 - 1400	900 - 1250
590	1.7	1000 - 1250	800 - 1000
500	2	900 - 1120	710 - 900
400	2.5	800 - 1000	630 - 710
330	3	630 - 800	560 - 630
250	4	450 - 710	450 - 500
165	6	355 - 450	280 - 315
125	8	250 - 315	250 - 280
100	10	180 - 224	224 - 250
84	12	140 - 180	160 - 180
71	14	125 - 160	125 - 140
63	16	112 - 140	112 - 125
56	18	100 - 125	100 - 112
50	20	80 - 112	90 - 100
42	24	71 - 90	80 - 90
36	28	63 - 80	71 - 80
31	32	63 - 71	63 - 71
28	36	45 - 63	50 - 63
25	40	35.5 - 50	40 - 56
22	44	28 - 40	31.5 - 40
20	50	22.4 - 35.5	
18	56	16 - 20	
16	60		
14	70		
12	85		
10	100		
8.5	120		

The values mentioned above are guiding values.
The final traveller weights should be selected by trials.

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