



# **Modular Chain Catalogue**

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## **2021**

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## WHAT WE DO:

Nusaf Dynamic Technologies (Pty) Ltd, specialises in the manufacture and supply of products for the food, beverage, packaging, labelling and machine manufacturing industries. Locally manufacturing our Nusaf products as well as proudly distributing Chiaravalli, Tecom and Regina products.

## VALUE PROPOSITION:

Our pride is our service - offering bespoke and customised service is what drives us to strive for perfection. With our team of highly skilled professionals, our constant innovation and modern machining capabilities we can assure you that our products are of the highest quality and offer you the reliability that you are looking for.

## PROUDLY DISTRIBUTING:



### JOHANNESBURG

Work: 011 885 2523  
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Email: pe@nusaf.co.za

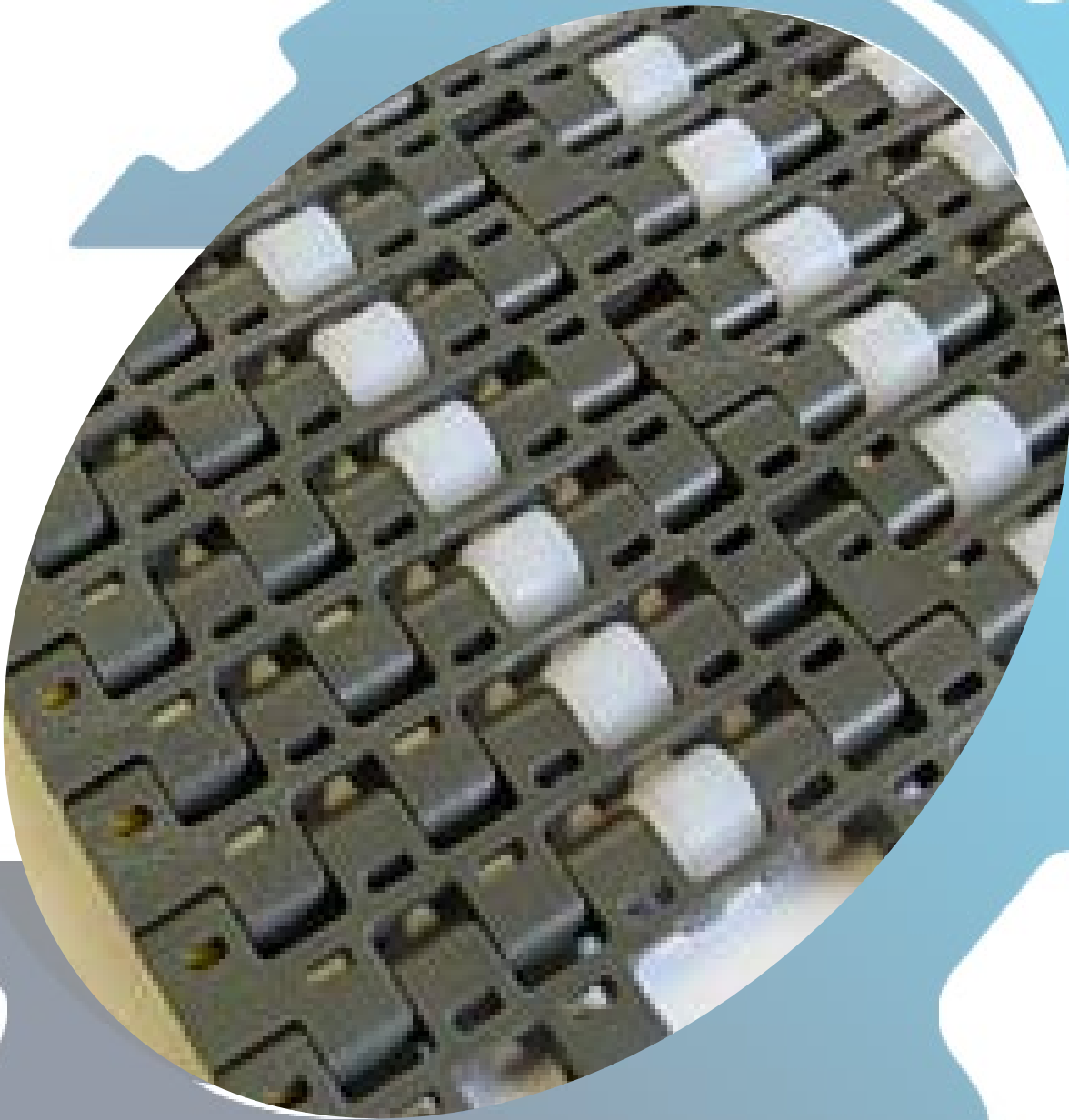
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# 1535 / 1536 & Low Back Pressure Chain

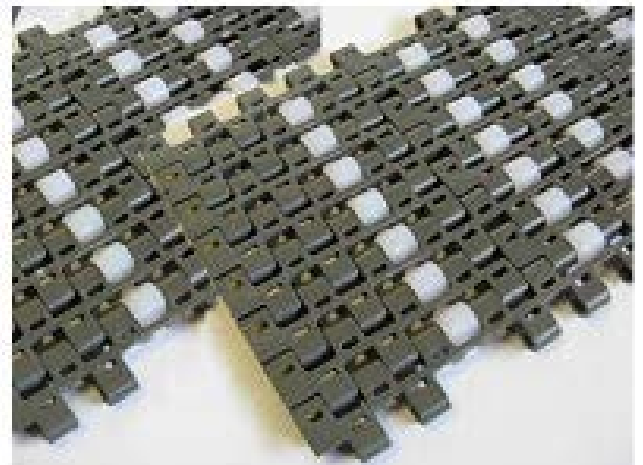
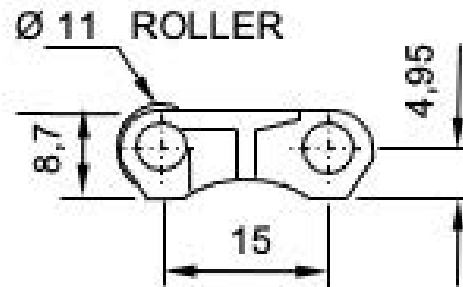
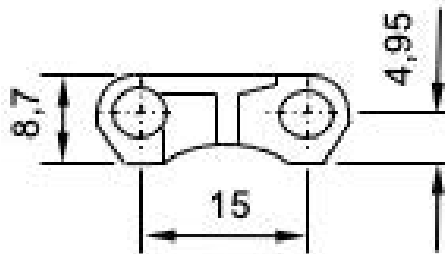


# Chain Data

Pitch	15.00 mm Straight Running			Approximate Weight (kg/m <sup>2</sup> )	
Open Area	1535	(2%)	Solid Top	POM ±6.35	PP ±4.55
Open Area	1536	(26%)	Perforated Top	POM ±5.55	PP ±3.90
Open Area	1536 LBP	(22%)	Perforated Top	POM ±5.65	PP ±4.00
Roller Dia	11 mm				

Materials Used	WAC	BAC	SP	WPP	BPP	BHT
	POM			Polypropylene		Heat Stabilised
Colour	White	Blue	Grey	White	Blue	Black
Nominal Strength	13300 N/m	13300 N/m	13300 N/m	7300 N/m	7300 N/m	15500 N/m

	BAC + SP	PP	BHT
In Air	-40°C to +80°C	5°C to 104°C	-90°C to +190°C
In Hot Water	-40°C to +65°C	5°C to 104°C	NA
Pin Material	Acetal, Polypropylene, M/St or St/St		
Pin Retention	Plugs		



# Sprocket Data

Code	No Of Teeth	Pitch Dia (Dp)	Outside Dia (De)
KU 1535 T07 R	7	33.45	34.30
KU 1535 T12 R	12	57.96	58.30
KU 1535 T16 R	16	76.89	77.70
KU 1535 T18 R	18	86.52	87.32
KU 1535 T22 R	22	105.74	105.74
KU 1535 T24 R	24	114.91	115.50
KU 1535 T25 R	25	120.16	120.96
KU 1535 T32 R	32	153.42	154.90

**MATERIAL: POLYAMIDE (PA) YELLOW**

**KEYWAY SEAT: UNI 6604-69**

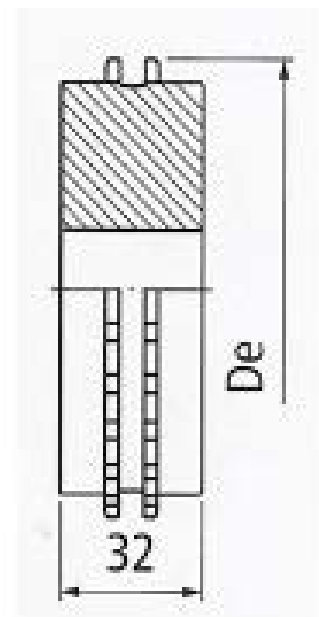
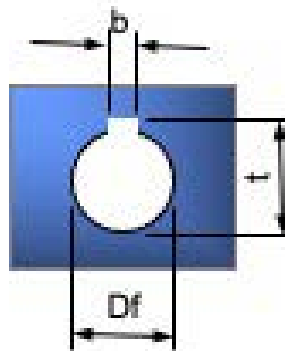
**ACETAL AND POLYETHYLENE MATERIALS ON REQUEST**

**NOTE: THE KU 1535 T32 CAN BE FITTED ONTO  
MOTORIZED DRUMS**

## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

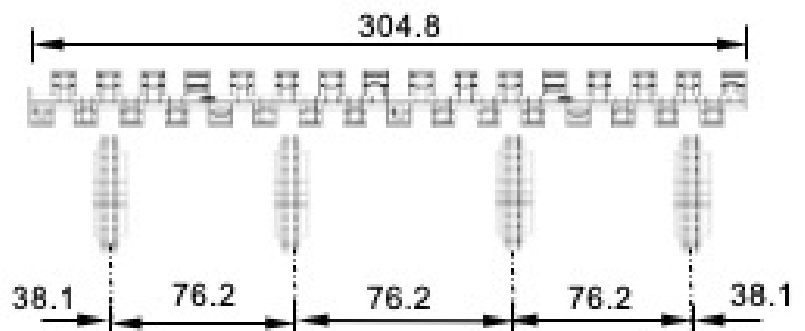


## POSITION & QUANTITY OF SPROCKETS

**NUMBER OF DRIVE SPROCKETS:**

**THE DRAWING INDICATES THE DIFFERENT POSITIONS  
FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE  
QUANTITY VARIES WITH THE FACTOR F/F MAX.**

Factor F/F Max	Qty Sprockets
0.00 ÷ 0.25	2
0.26 ÷ 0.50	4
0.51 ÷ 0.75	6
0.76 ÷ 1.00	8



# 2536 Flush Grid

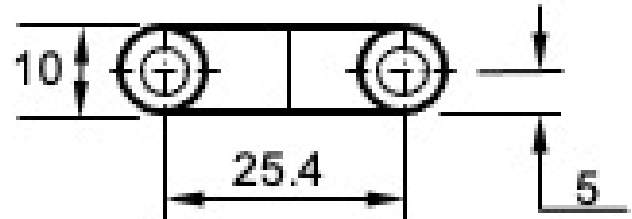




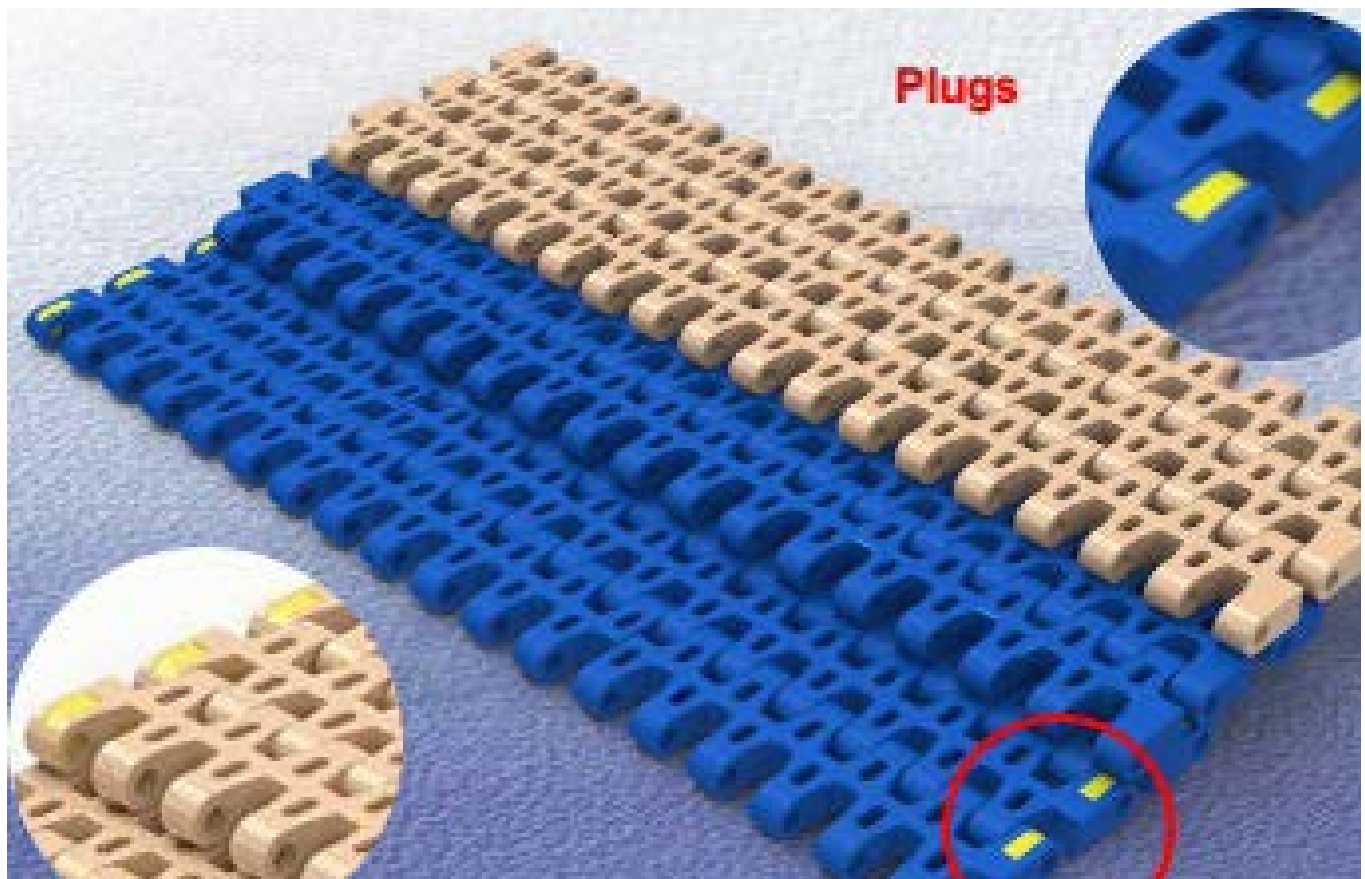
# Chain Data

Pitch	25.4mm (1") Straight Running			Approximate Weight (Kg/m <sup>2</sup> )	
Open Area	2536	(38%)	Flush Grid	POM ±8.6	PP ±5.6
Materials Used	LF	WAC	BAC	SP	
	POM				
Colours	Brown	White	Blue	Grey	
Nominal Strength	37000 N/m	37000 N/m	37000 N/m	37000 N/m	

Materials Used	WPP	BPP
	Polypropylene	
Colour	White	Blue
Nominal Strength	24000 N/m	24000 N/m



	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Acetal or Polypropylene	
Pin Retention	Plugs	



# Sprocket Data

Code	No Of Teeth	PCD (Dp)	OD (De)
KU 2536 T08 R	8	66.53	69.17
KU 2536 T09 R	9	74.30	77.49
KU 2536 T11 R	11	89.43	93.40
KU 2536 T12 R	12	97.56	101.90
KU 2536 T13 R	13	105.70	110.40
KU 2536 T15 R	15	121.96	127.38
KU 2536 T17 R	17	138.22	144.36
KU 2536 T19 R	19	154.48	161.35
KU 2536 T20 R	20	162.63	166.62

**MATERIAL: POLYAMIDE (PA) YELLOW**

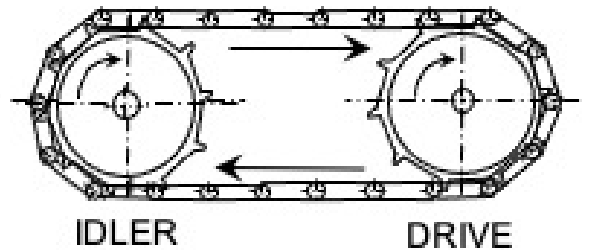
**KEYWAY SEAT: UNI 6604-69**

**ACETAL AND POLYETHYLENE MATERIALS ON REQUEST**

**NOTE: THE KU 1535 T32 CAN BE FITTED ONTO**

**MOTORIZED DRUMS**

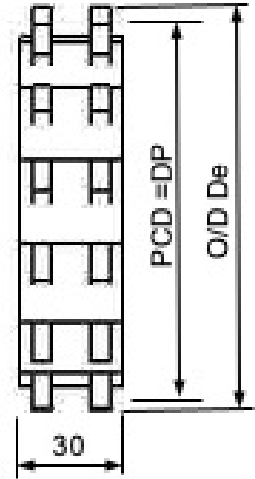
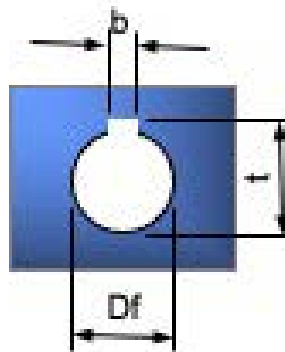
**\*BIGGER SIZES ON REQUEST**



## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

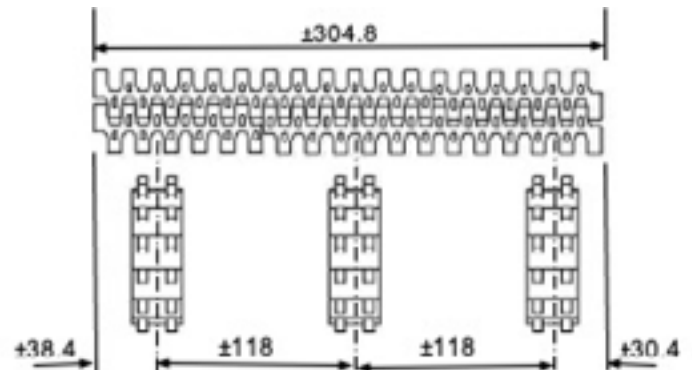


## POSITION & QUANTITY OF SPROCKETS

**NUMBER OF DRIVE SPROCKETS:**

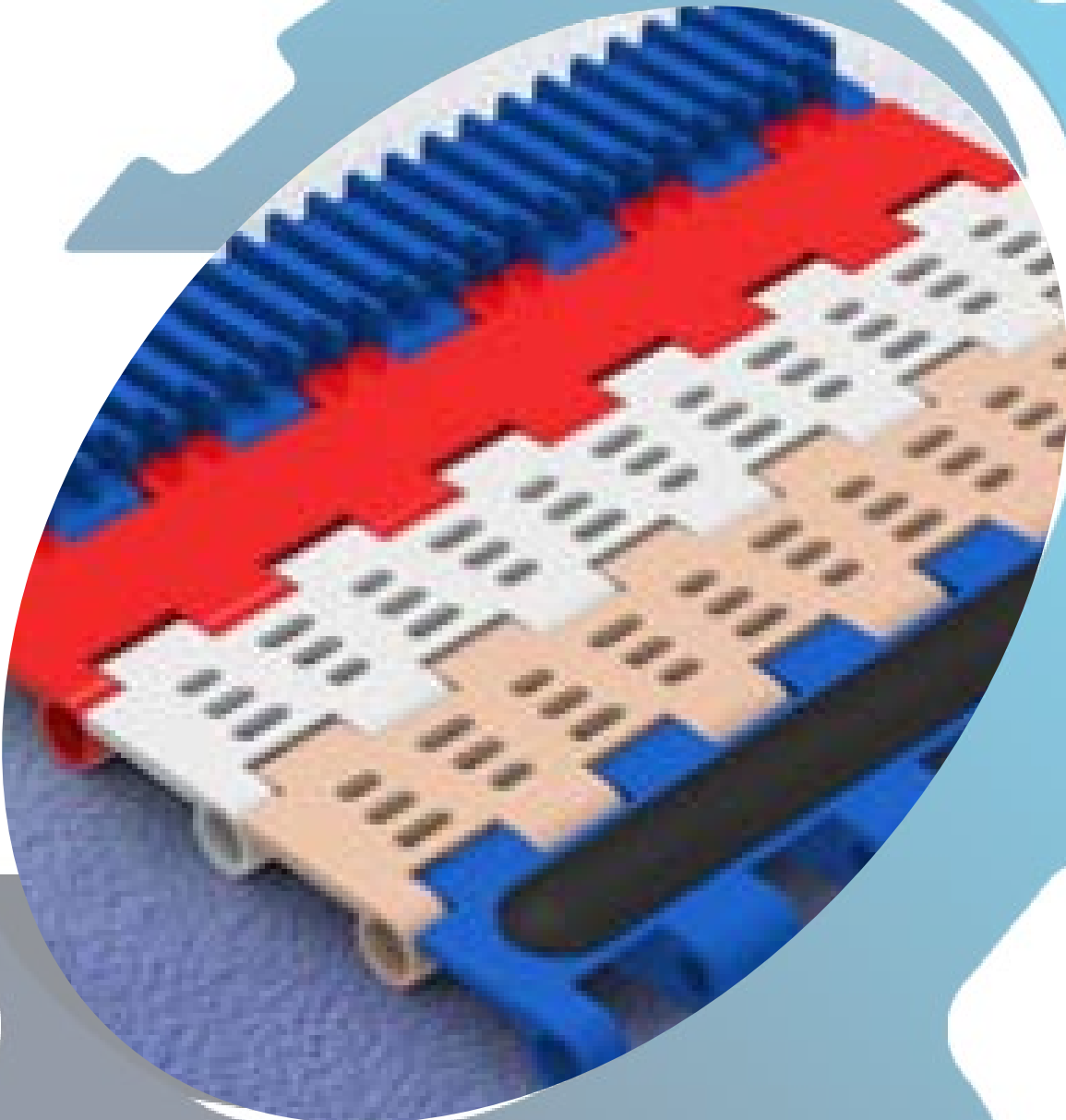
**THE DRAWING INDICATES THE DIFFERENT POSITIONS FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE QUANTITY VARIES WITH THE FACTOR F/F MAX.**

Factor F/F Max	Qty Sprockets
0.00 ÷ 0.25	2
0.26 ÷ 0.50	4
0.51 ÷ 0.75	6
0.76 ÷ 1.00	8



# 2135 / 2136 / 2137

With Pusher, Side Guides, High Friction Link, Nub Top & Raised Rib

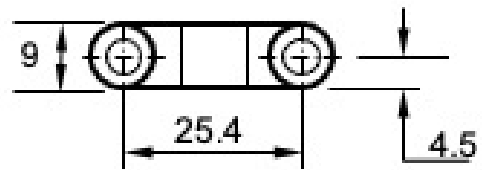


# Chain Data

Pitch	25.4mm (1") Straight Running			Approximate Weight (Kg/m <sup>2</sup> )	
Open Area	2135	(5%)	Solid Top	POM ±5.20	PP ±4.10
Open Area	2136	(36%)	Perforated Top	POM ±4.85	PP±3.75

Materials Used	LF	WAC	BAC	SP	
	POM				
Colours	Brown	White	Blue	Grey	Black
Nominal Strength	15000N/m	15000N/m	15000N/m	15000N/m	14000N/m

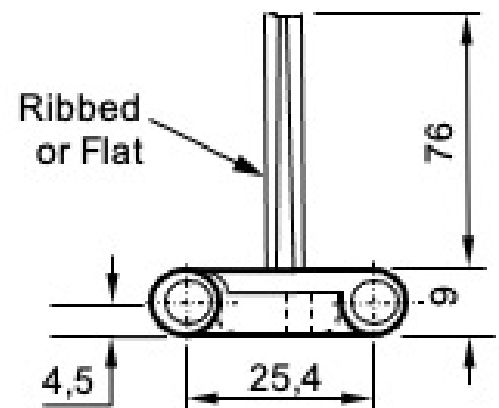
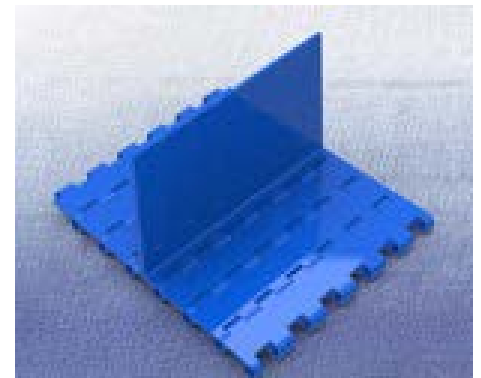
Materials Used	WPP	BPP
	Polypropylene	
Colour	White	Blue
Nominal Strength	7200 N/m	7200 N/m



	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Acetal or Polypropylene	
Pin Retention	Plugs or Hot Formed Heads	

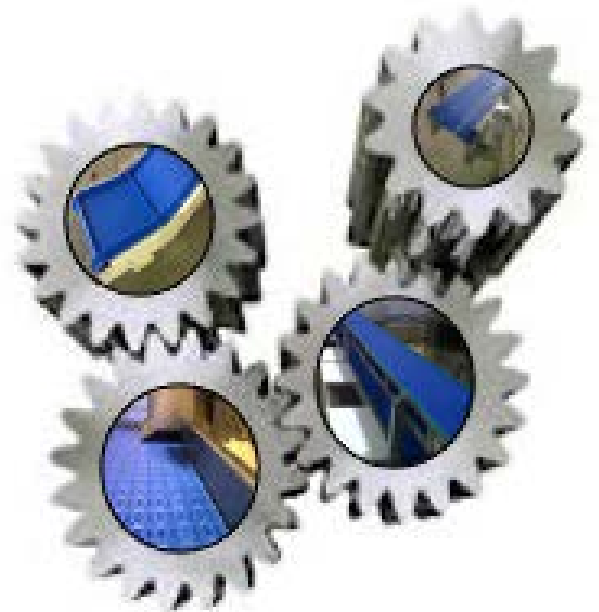
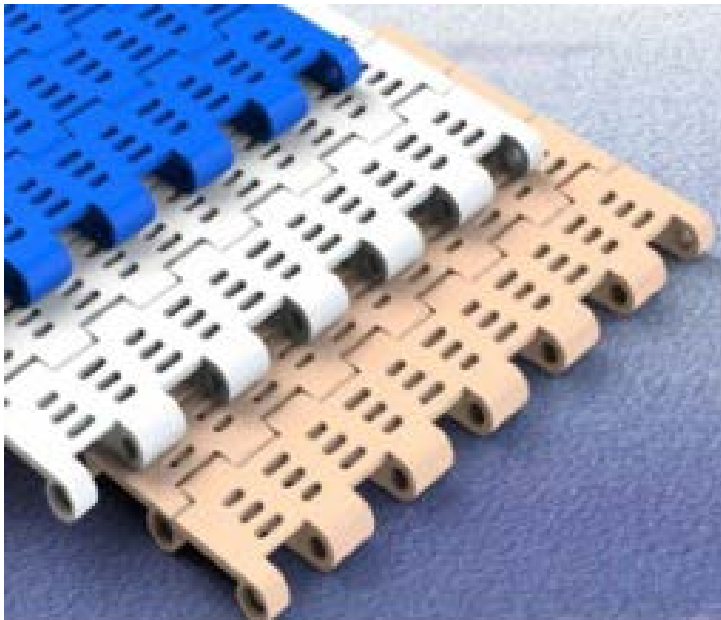
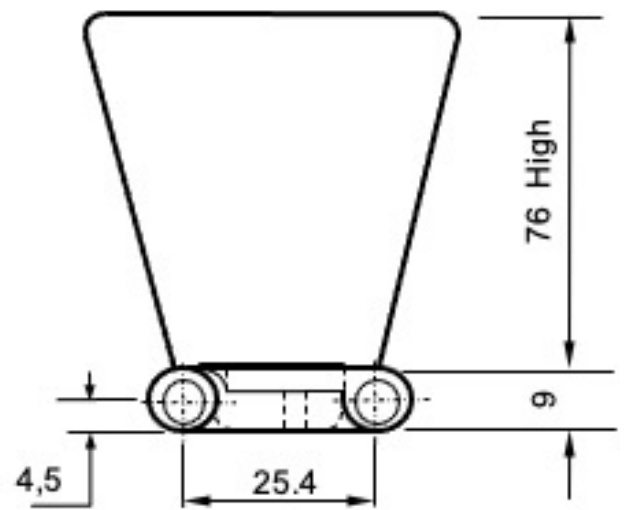
## PUSHER ATTACHMENTS

Material Used	Code	Height	Colour
LF	LF2315	76mm	Light Brown
POM	WAC 2135	76mm	White
	BAC 2135	76mm	Blue
	UV 2135	76mm	Black
PP	WPP 2135	76mm	White
	BPP 2135	76mm	Blue



# Side Guides

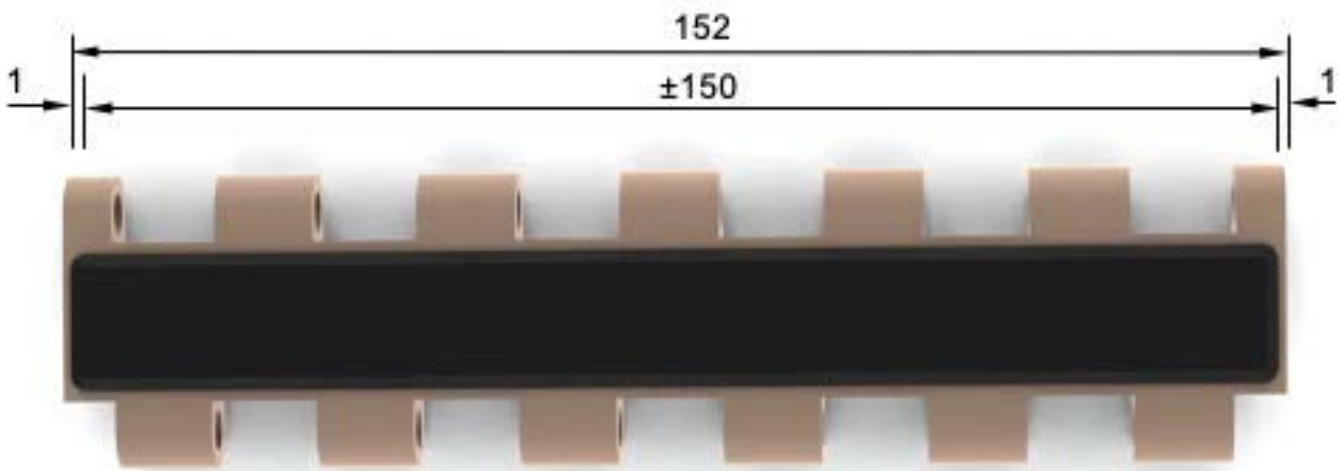
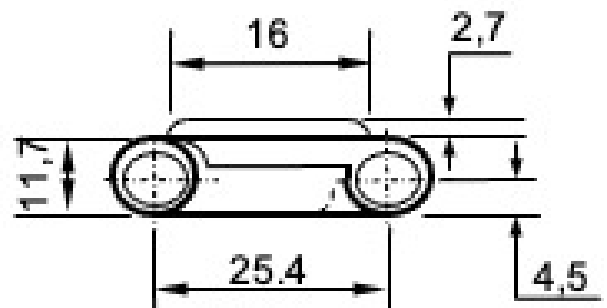
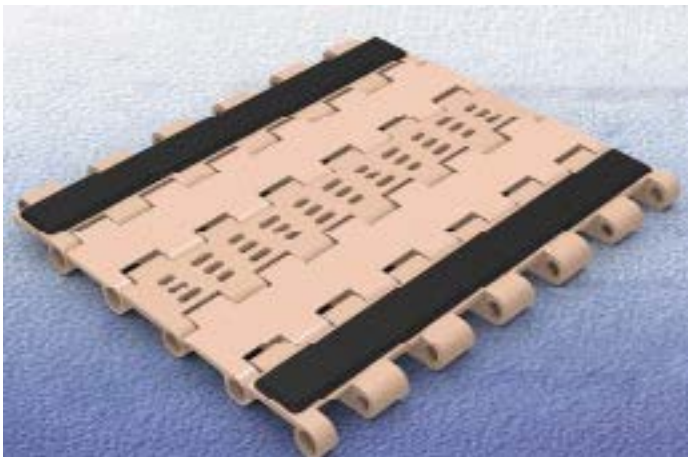
Materials Used	Code	Height	Colour
Polypropylene			
POM	WAC 2135 SG	76mm	White
	BAC 2135 SG	76mm	Blue
PP	WPP 2135 SG	76mm	White
	BPP 2135 SG	76mm	Blue



# High Friction Link

Pitch	25.4mm (1")
High Friction Link	HFL 2135

Rubber Material (Black or White) FDA Approved	TPE 50 Shore Hardness
	TPE 80 Shore Hardness

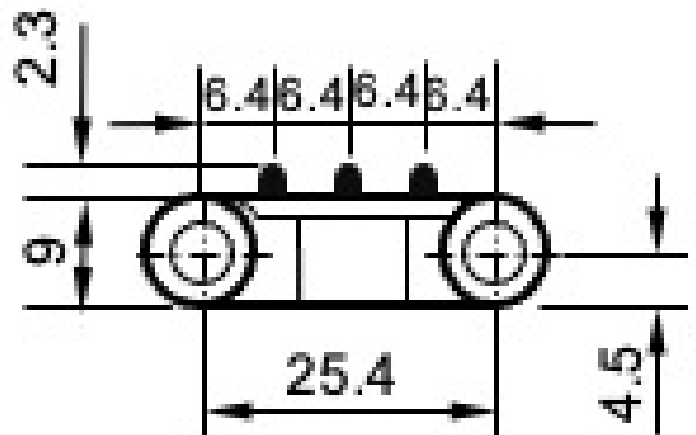
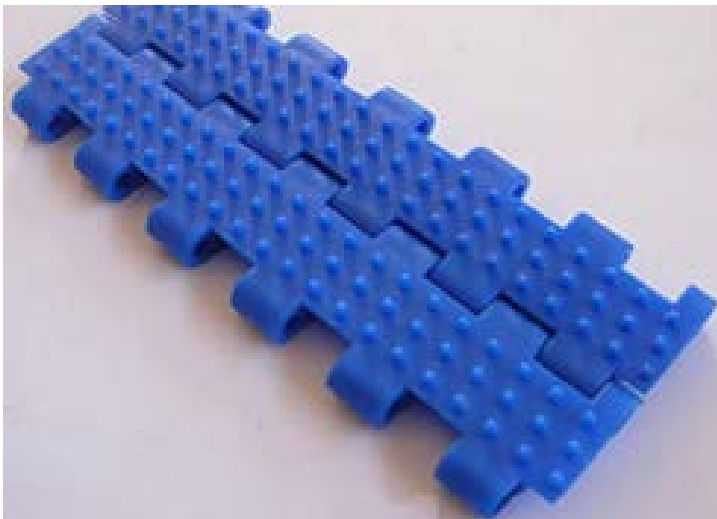


# Nub Top Link

Pitch	25.4mm (1") Straight Running			Approximate Weight (Kg/m <sup>2</sup> )	
Open Area	2135	(5%)	Nub Top	POM ±5.20	PP ±4.10

Materials Used	LF	WAC	BAC	UP	WPP	BPP
	POM					
Colours	Brown	White	Blue	Black	White	Blue
Nominal Strength	1500N/m	1500N/m	1500N/m	1400N/m	7200N/m	7200N/m

	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Acetal or Polypropylene	
Pin Retention	Plugs or Hot Formed Heads	



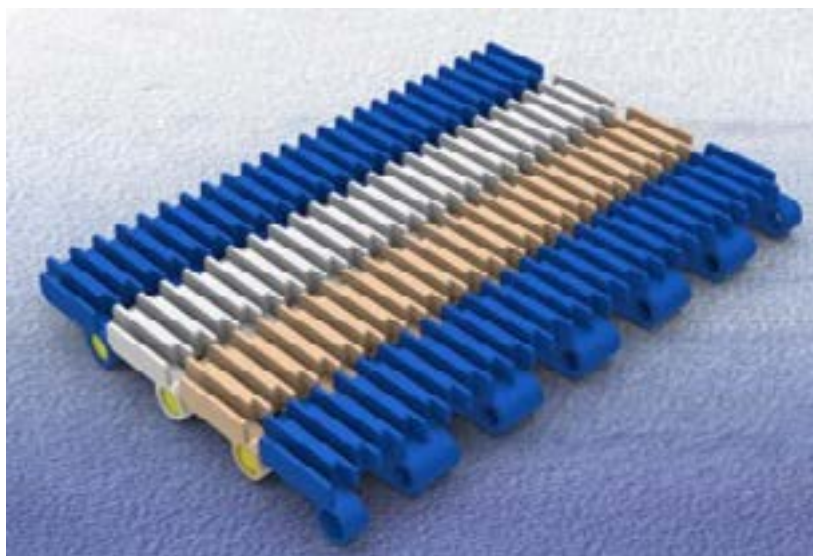
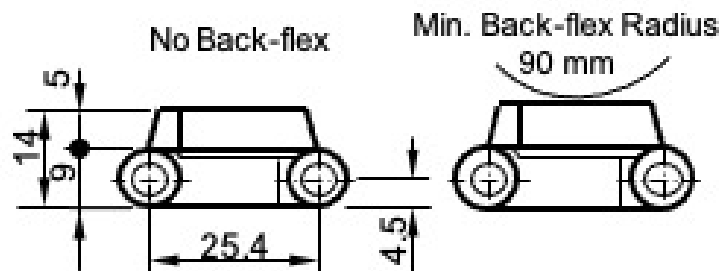


# Raised Rib

Pitch	25.4mm (1") Straight Running Back Flex and no Back Flex			Approximate Weight (Kg/m <sup>2</sup> )	
Open Area	2137	(5%)	Raised Rib	POM ±6.50	PP ±5.10

Materials Used	LF	WAC	BAC	UP	WPP	BPP
	POM					
Colours	Brown	White	Blue	Black	White	Blue
Nominal Strength	1500N/m	1500N/m	1500N/m	1400N/m	7200N/m	7200N/m

	POM	Polypropylene
In Air	-40°C to +80°C	5°c to 104°C
In Hot Water	-40°C to +65°C	5°c to 104°C
Pin Material	Acetal or Polypropylene	
Pin Retention	Plugs or Hot Formed Heads	



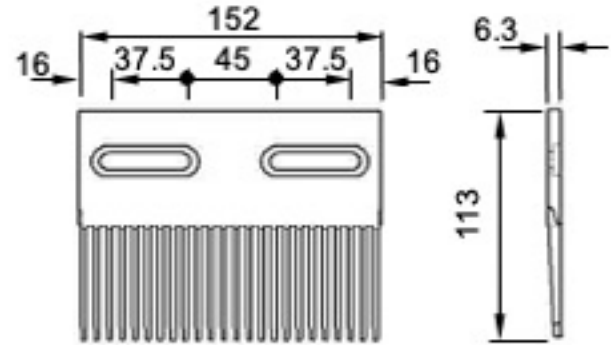


# Standard Transfer Plate

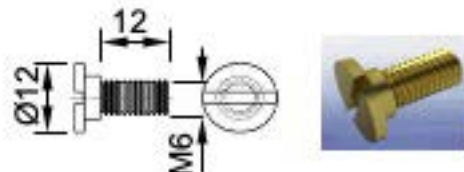
## SYSTEM OF INSTALLATION

THE TYPE OF MOUNTING TRANSFER PLATES DEPENDS ON THE OPERATING TEMPERATURES. TRANSFER PLATES MUST HAVE THE POSSIBILITY TO CHANGE LATERAL POSITION IN ACCORDANCE WITH THE THERMAL EXPANSION / CONTRACTION OF THE CHAIN AS THE TEETH MUST STAY BETWEEN THE RIBS OF THE CHAIN.

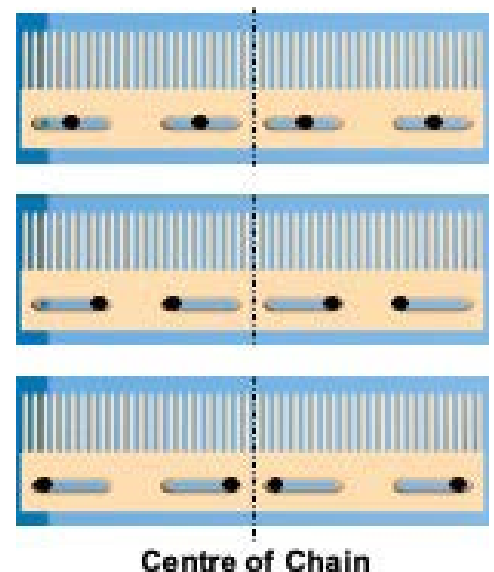
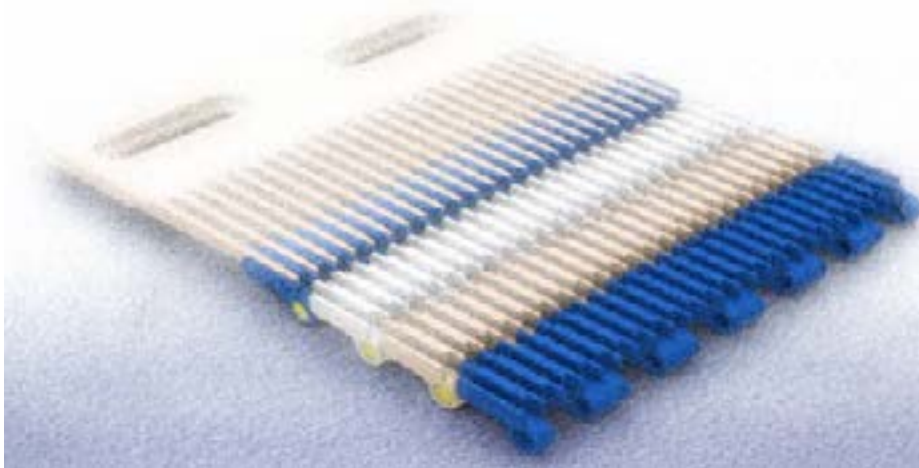
Comb Code	L mm	Material
LF2137-TC	152	LF Acetal



SUPPLIED WITH SCREWS 2137-M6X12 BRASS SCREW AND PLUGS (CLIP IN) FOR SLOTTED HOLES.



2137 M6x12 brass mounting screw



# Sprocket Data

Code	No Of Teeth	Pitch	OD
KU 2135 T07 R	7	57.34	56.57
KU 2135 T09 R	9	73.72	72.73
KU 2135 T10 R	10	81.89	80.81
KU 2135 T11 R	11	90.18	88.91
KU 2135 T12 R	12	97.44	97.81
KU 2135 T13 R	13	105.57	105.96
KU 2135 T15 R	15	121.81	122.26
KU 2135 T16 R	16	129.24	131.00
KU 2135 T18 R	18	146.17	146.71
KU 2135 T19 R	19	154.34	156.91

**MATERIAL: POLYAMIDE (PA) YELLOW**

**KEYWAY SEAT: UNI 6604-69**

**ACETAL AND POLYETHYLENE MATERIALS ON REQUEST**

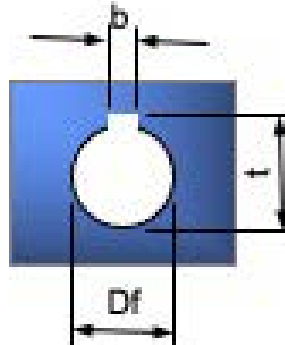
**NOTE: THE KU 1535 T32 CAN BE FITTED ONTO  
MOTORIZED DRUMS**

**\*BIGGER SIZES ON REQUEST**

## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

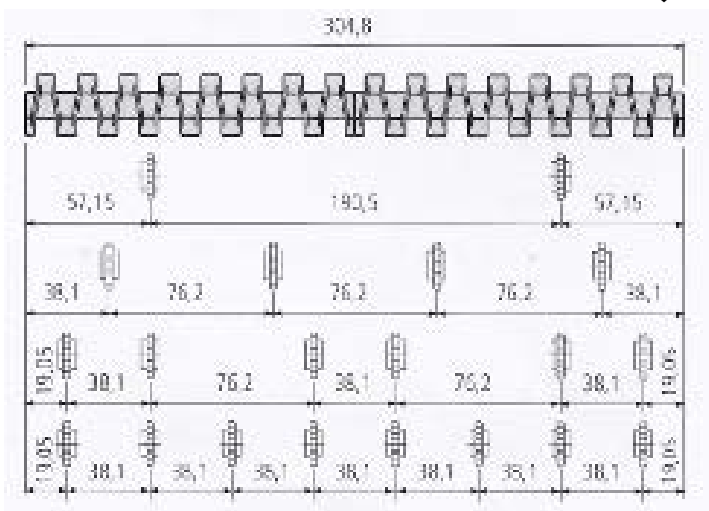


**NUMBER OF RETURN SPROCKETS  
FOR UNI-DIRECTIONAL CONVEYORS, 2  
SPROCKETS FOR EVERY 304,8mm OF CHAIN**

## POSITION & QUANTITY OF SPROCKETS

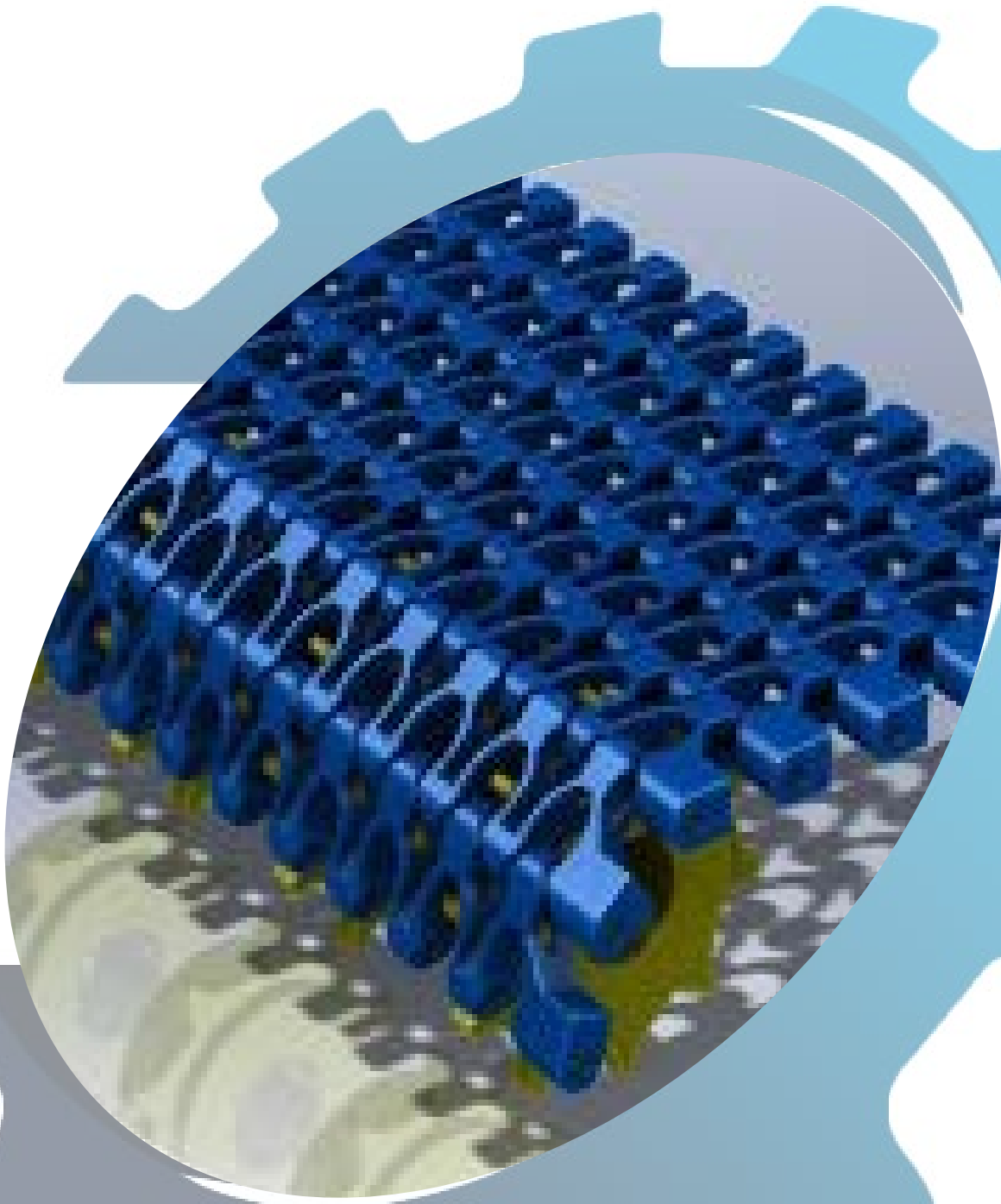
**NUMBER OF DRIVE SPROCKETS:**

**THE DRAWING INDICATES THE DIFFERENT POSITIONS  
FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE  
QUANTITY VARIES WITH THE FACTOR F/F MAX.**



Factor F/F Max	Qty Sprockets
0.00 ÷ 0.25	2
0.26 ÷ 0.50	4
0.51 ÷ 0.75	6
0.76 ÷ 1.00	8

# 3030 / 3030 TAB Radius Chain



# Chain Data

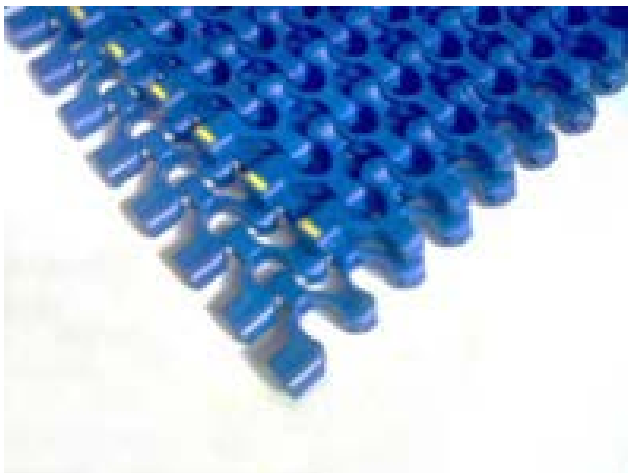
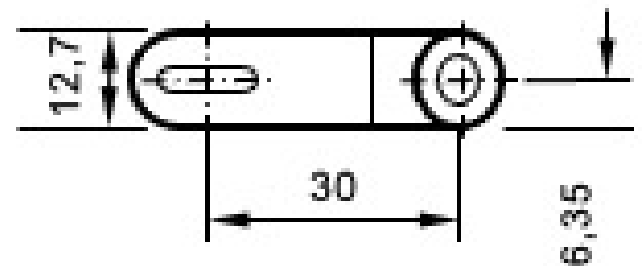
Pitch	30mm	Side Flexing Chain	
Open Area	3030	(68%)	Perforated

Materials Used	LF	WAC	BAC	SP	
	POM				
Colours	Brown	White	Blue	Grey	Curve
Nominal Strength	1500N/m	1500N/m	1500N/m	1400N/m	2000N/m

Materials Used	WPP	BPP	
	Polypropylene		
Colours	White	Blue	Corner
Nominal Strength	7200N/m	7200N/m	1660N/m

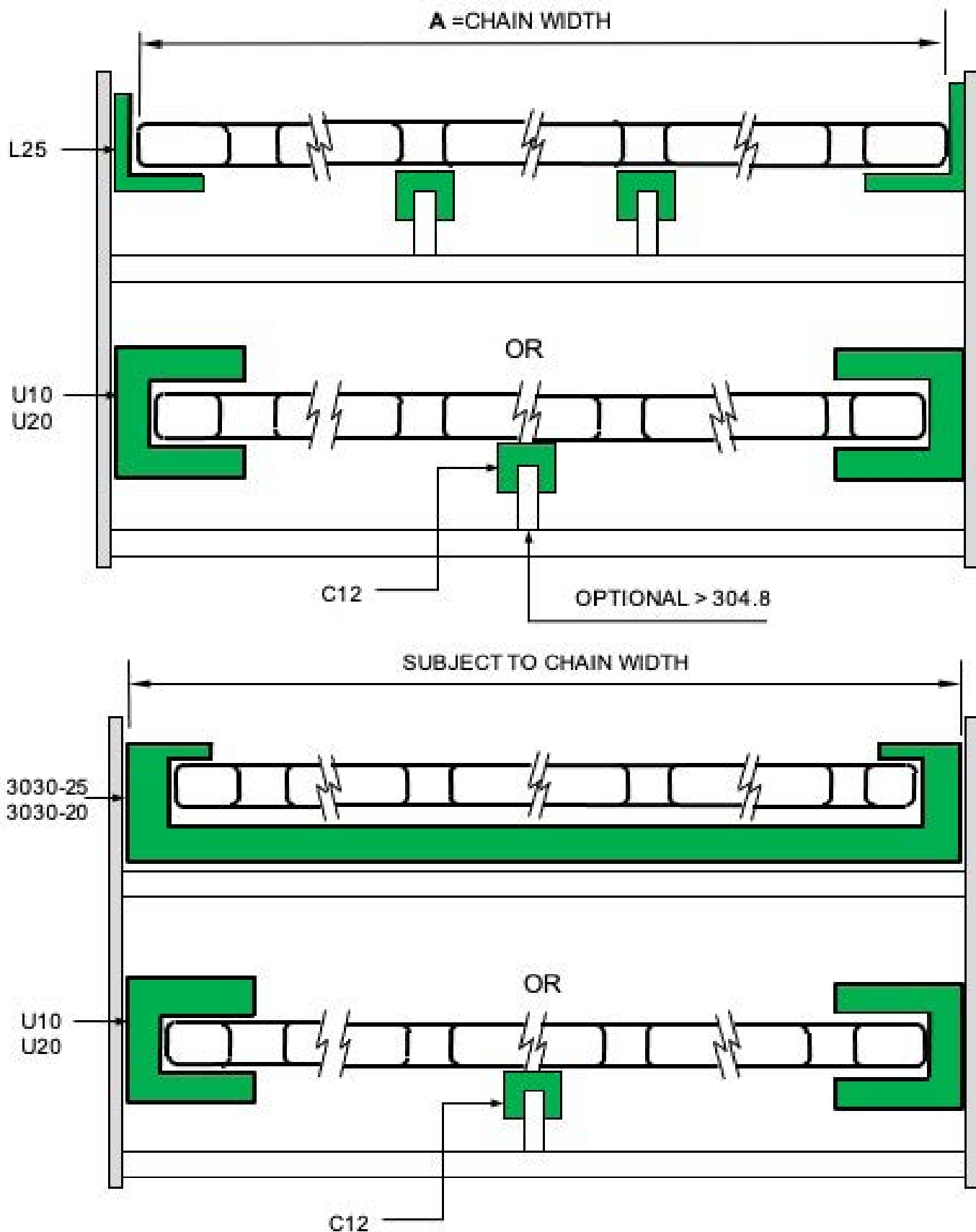
	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Acetal or Polypropylene	
Pin Retention	Plugs or Hot Formed Heads	

Minimum Radius	2.0 x Belt Width
Minimum Belt Width	102mm
Belt Weight	±9 kg/m <sup>2</sup>



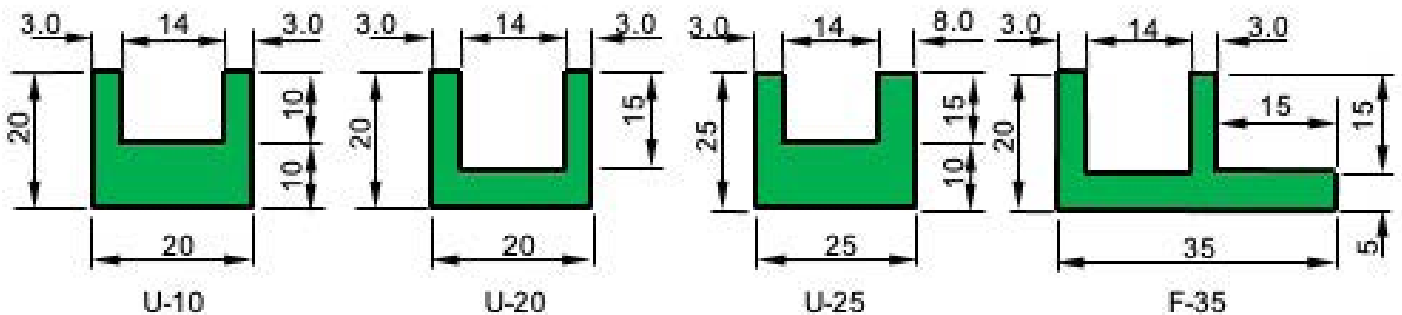
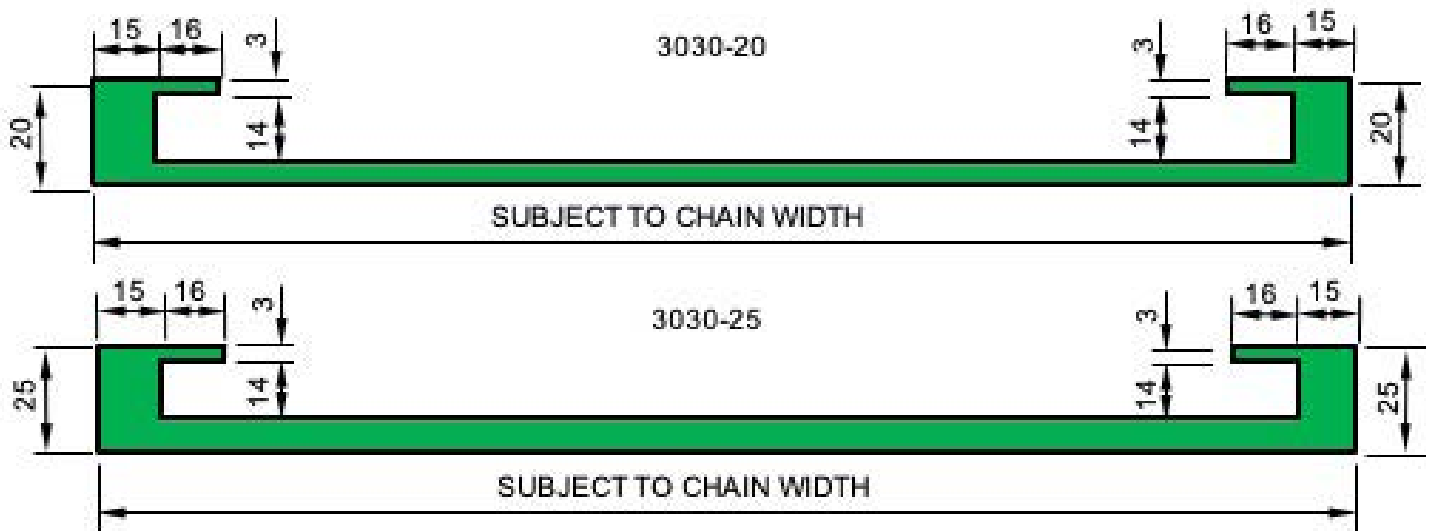
# Recommended Guide Profiles

## STRAIGHT RUNNING CHAIN - SECTION GUIDES



# Recommended Guide Profiles

## BEND AND GUIDE PROFILE DATA

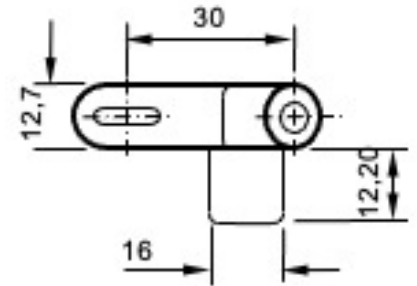
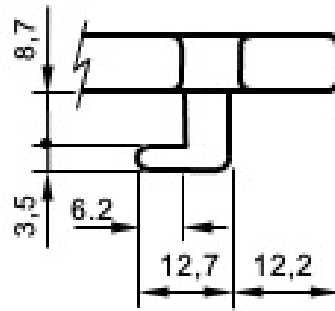


**NOTE: M6 BRASS INSERTS SHOULD BE USED ON BENDS (NOT SUPPLIED)**

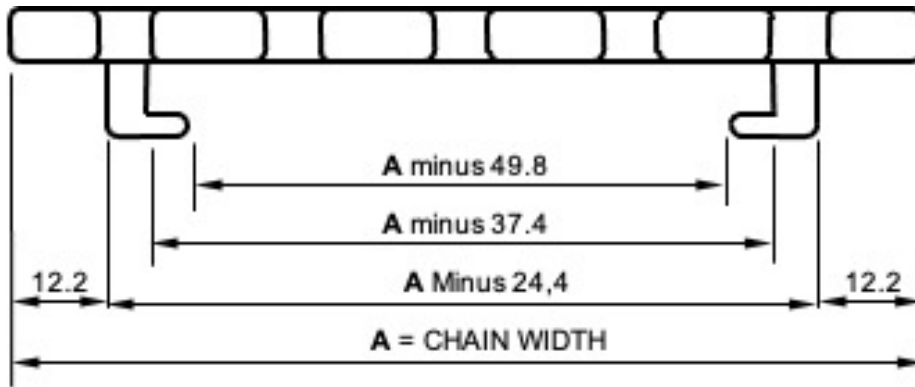
Code	Material	Colour
3030-20	UHMWPE	Green / Black
3030-25	UHMWPE	Green / Black
3030-U10	UHMWPE	Green / Black
3030-U20	UHMWPE	Green / Black
3030-U25	UHMWPE	Green / Black
3030-F35	UHMWPE	Green / Black

**NOTE: FOR FRICTION FACTORS BETWEEN WEARSTRIPS AND CHAIN SEE PAGE 66**

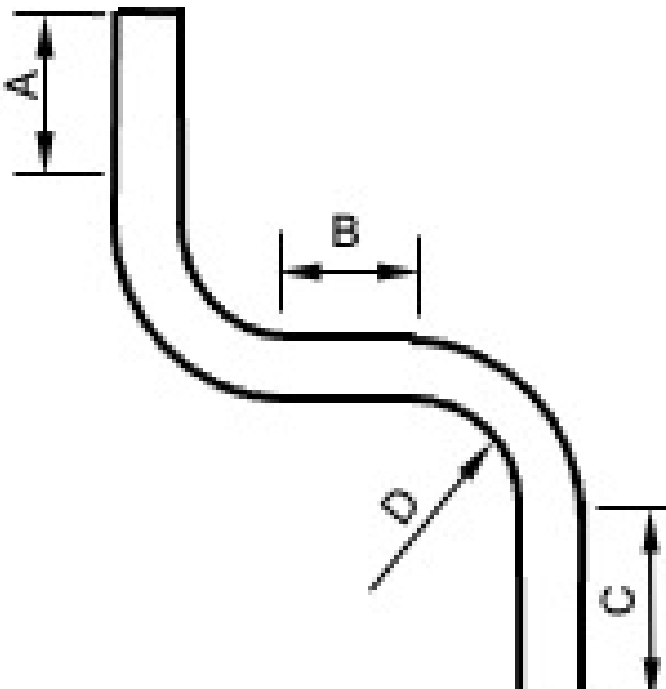
# 3030 TAB Chain



## TAB DETAILS:



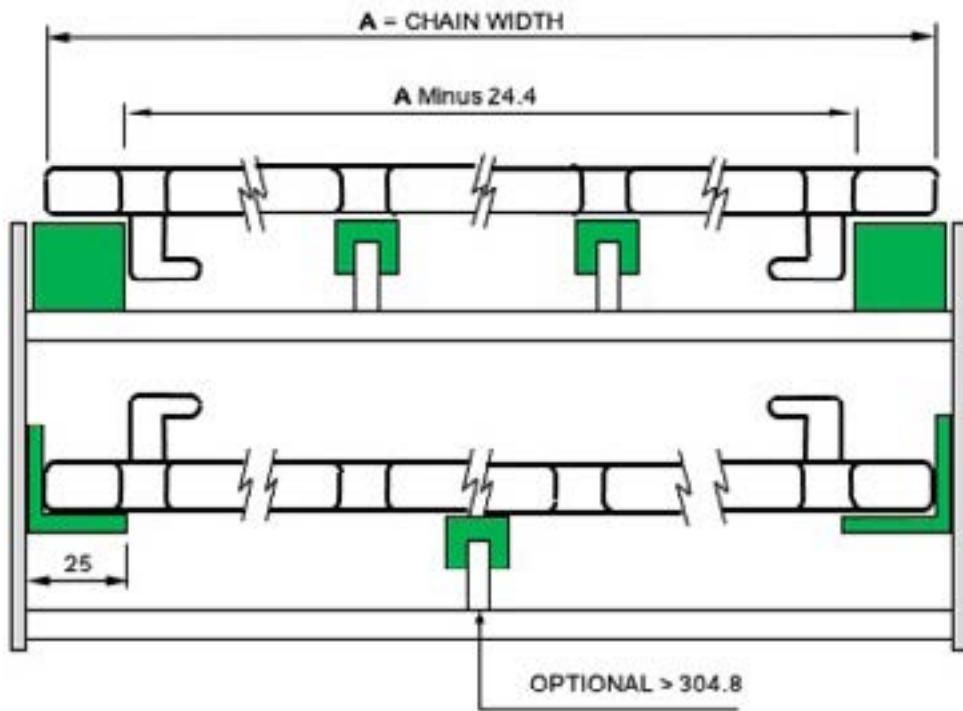
## LAYOUT GUIDELINES:



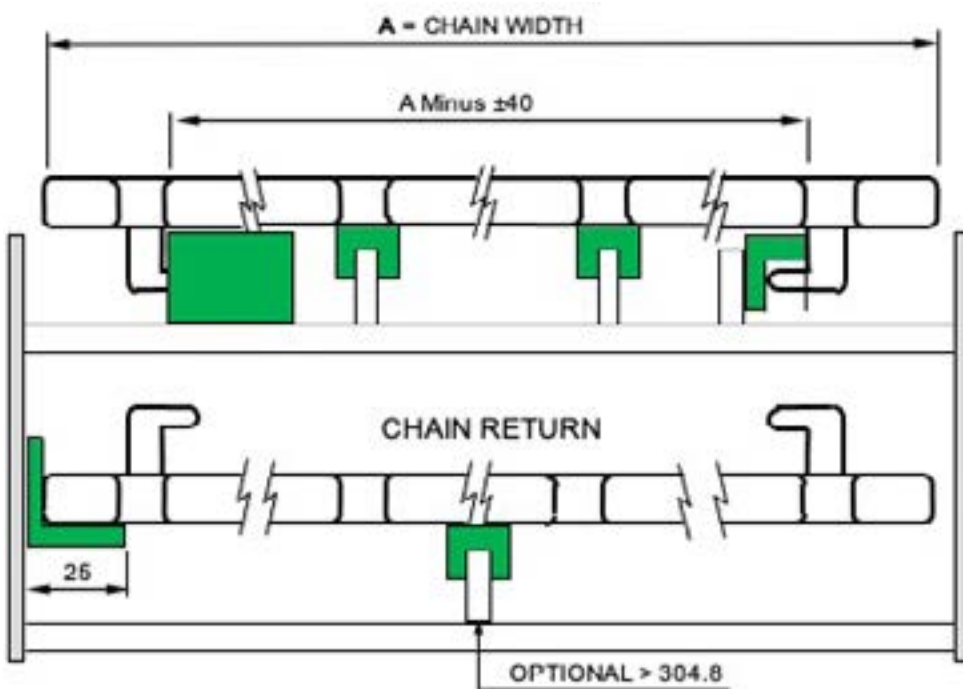
A	*Minimum straight section - drive end 1000mm with normal drive, 750mm with gravity tensioner. *3000 max length with KUT3030T15 drive sprocket. (Total length not to exceed 8m)
B	*Minimum straight in between 2 curves (S-bend) 1.5 x chain width.
C	*Minimum straight section - idler end 500mm *3000mm max length with KUT3030T15 drive sprocket. (Total length not to exceed 8m)
D	*Minimum inside radius: 2 x chain width.

# Recommended Guide Profiles

## TAB CHAIN - SECTION GUIDE



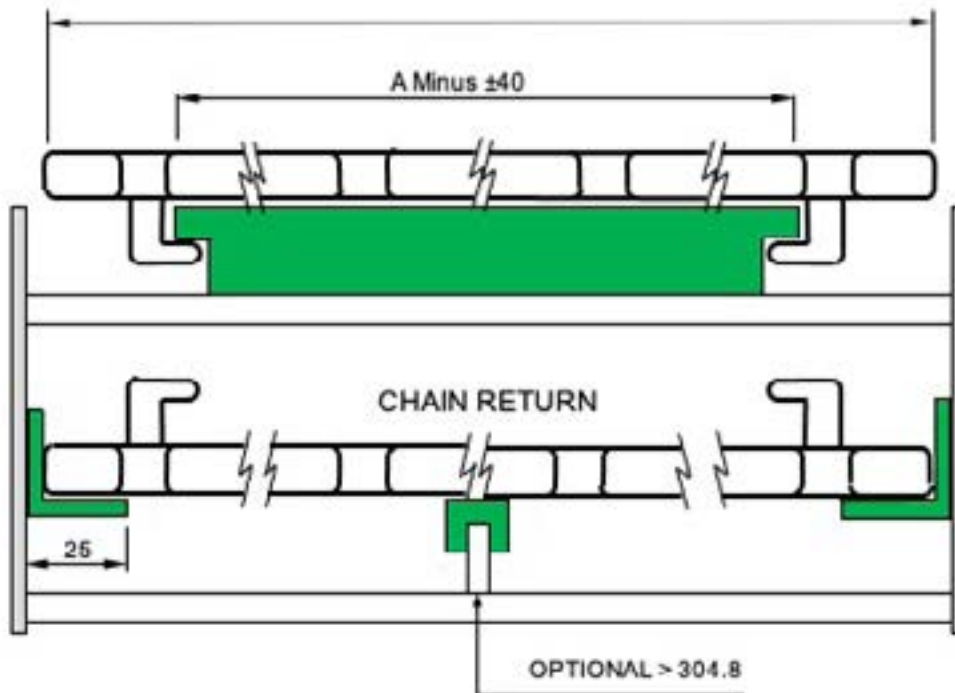
## TAB CHAIN - CURVE SECTION GUIDE





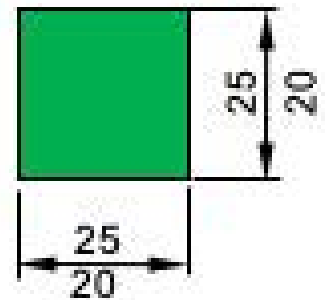
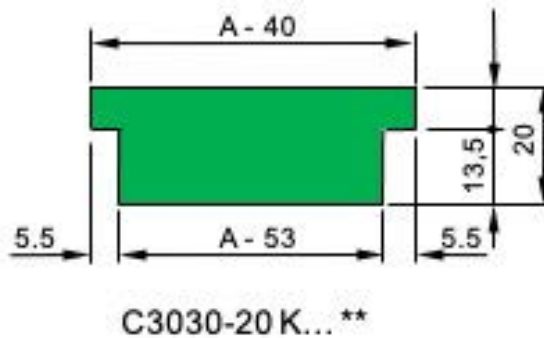
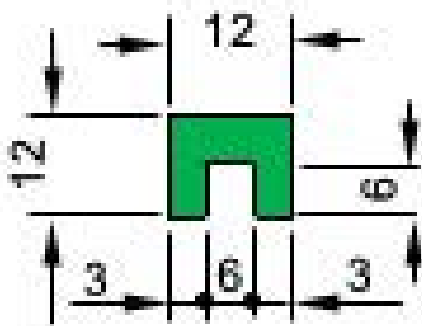
# Recommended Guide Profiles

## TAB CHAIN - CURVE SECTION GUIDE

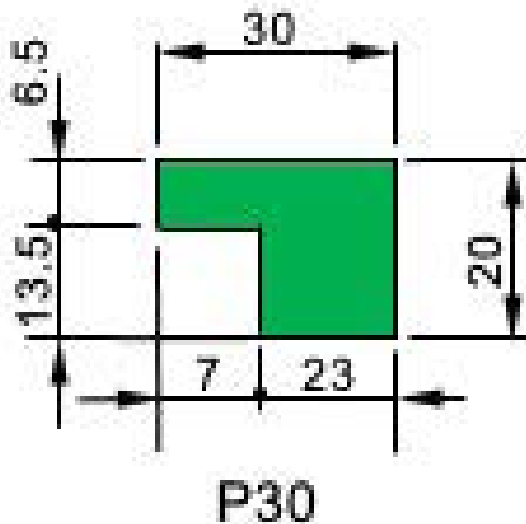
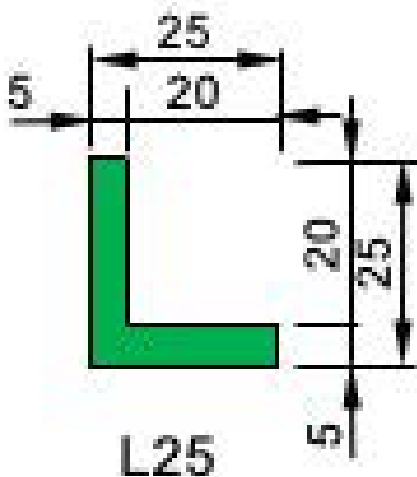


**NOTE: DYNAMIC ROLLERS CAN BE USED ON THE RETURN**

## TAB CHAIN - BEND AND GUIDE PROFILE DATA



S25  
S20



**NOTE: FOR FRICTION FACTORS BETWEEN WEARSTRIPS AND CHAIN SEE PAGE 66**

**\*\*K = CHAIN WIDTH**

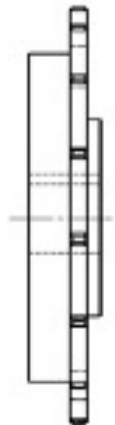
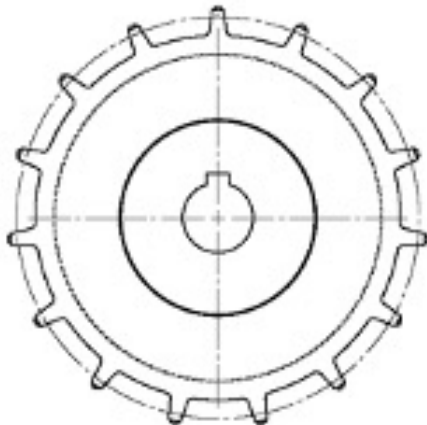
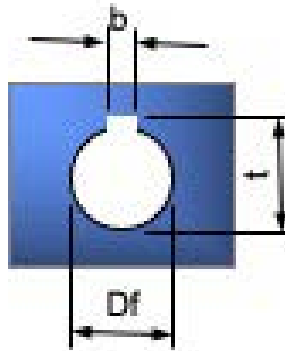
# Sprocket Data

Code	No Of Teeth	Pitch Dia (Dp)	Outside Dia (De)
KU 3030 T08 R...	8	71.8	80
KU 3030 T10 R...	10	91.22	100
KU 3030 T11 R...	11	101.8	110
KU 3030 T13 R...	13	121.88	130
KU 3030 T15 R...	15	140.72	150

## KEYWAY DIMENSIONS

DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

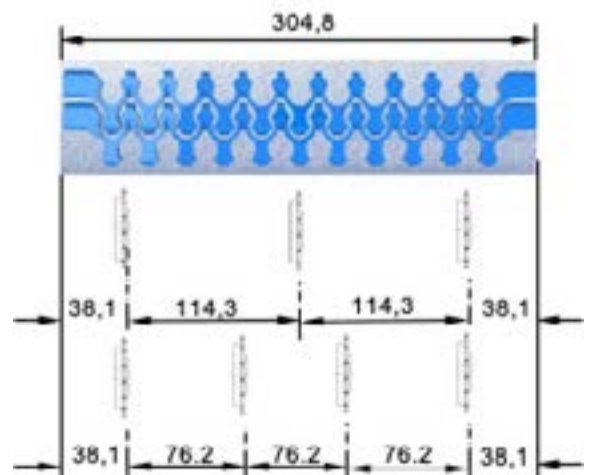


## POSITION & QUANTITY OF SPROCKETS

NUMBER OF DRIVE SPROCKETS:

THE DRAWING INDICATES THE DIFFERENT POSITIONS FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE QUANTITY VARIES WITH THE FACTOR F/F MAX.

Factor F/F Max	Qty Sprockets
0.00 ÷ 0.25	2
0.26 ÷ 0.50	4
0.51 ÷ 0.75	6
0.76 ÷ 1.00	8

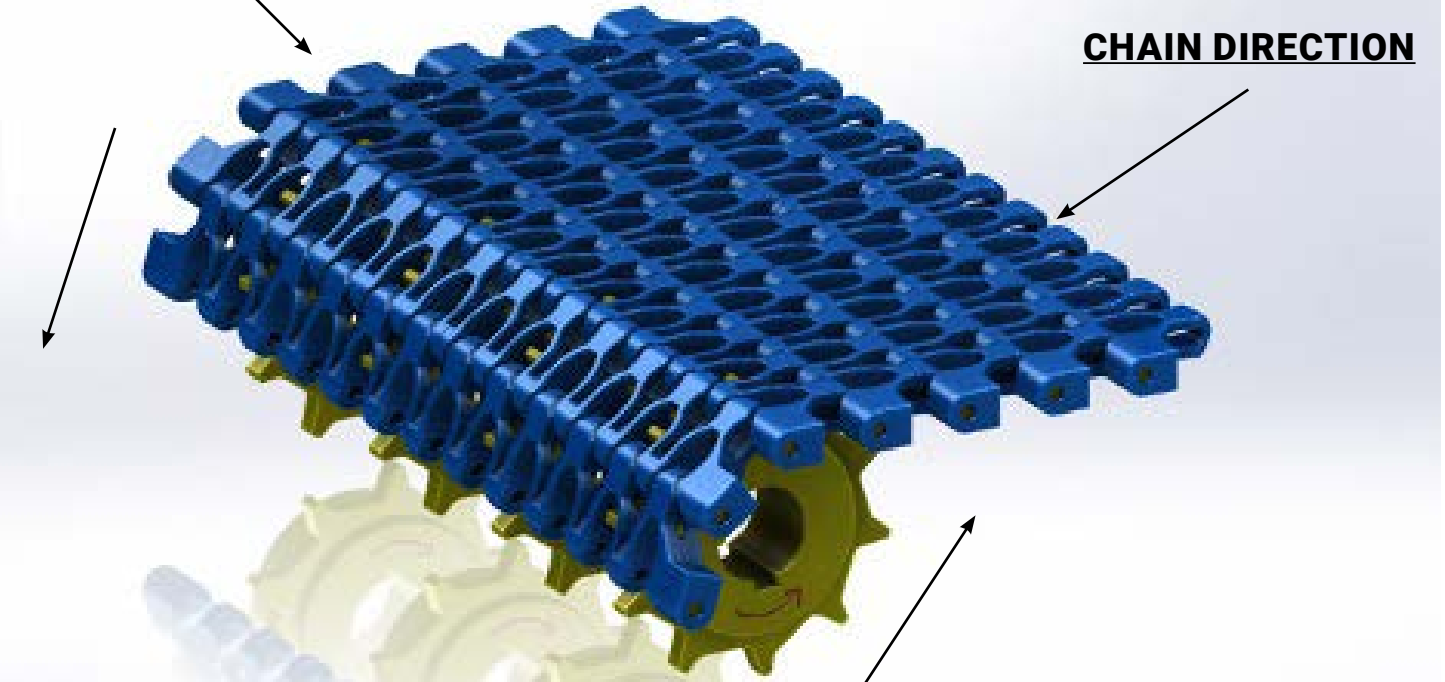


# Sprocket And Chain Direction

3030 DRIVE END

CHAIN POSITION

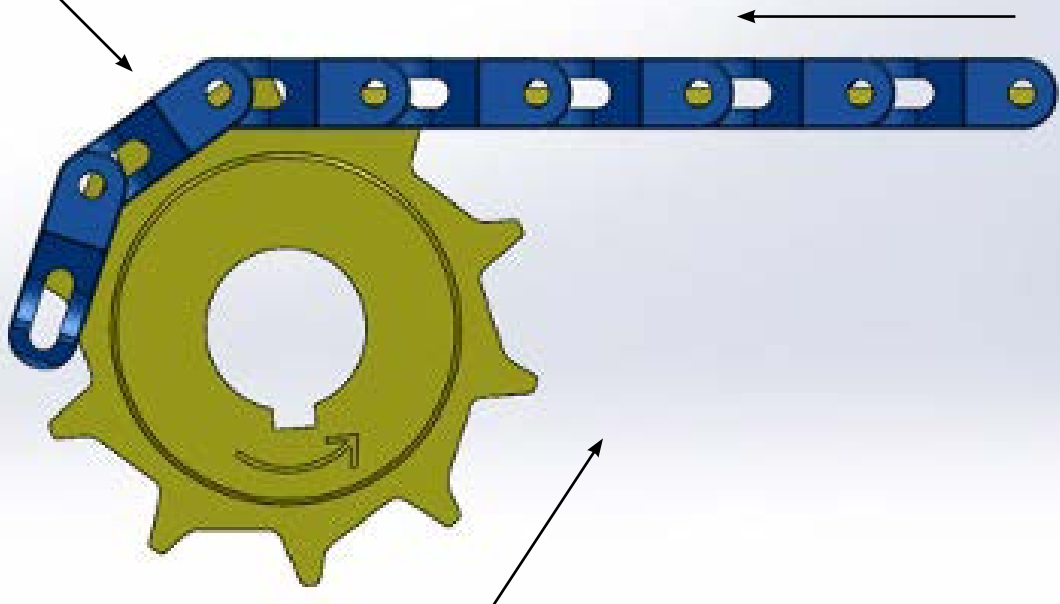
CHAIN DIRECTION



SPROCKET DIRECTION

CHAIN POSITION

CHAIN DIRECTION



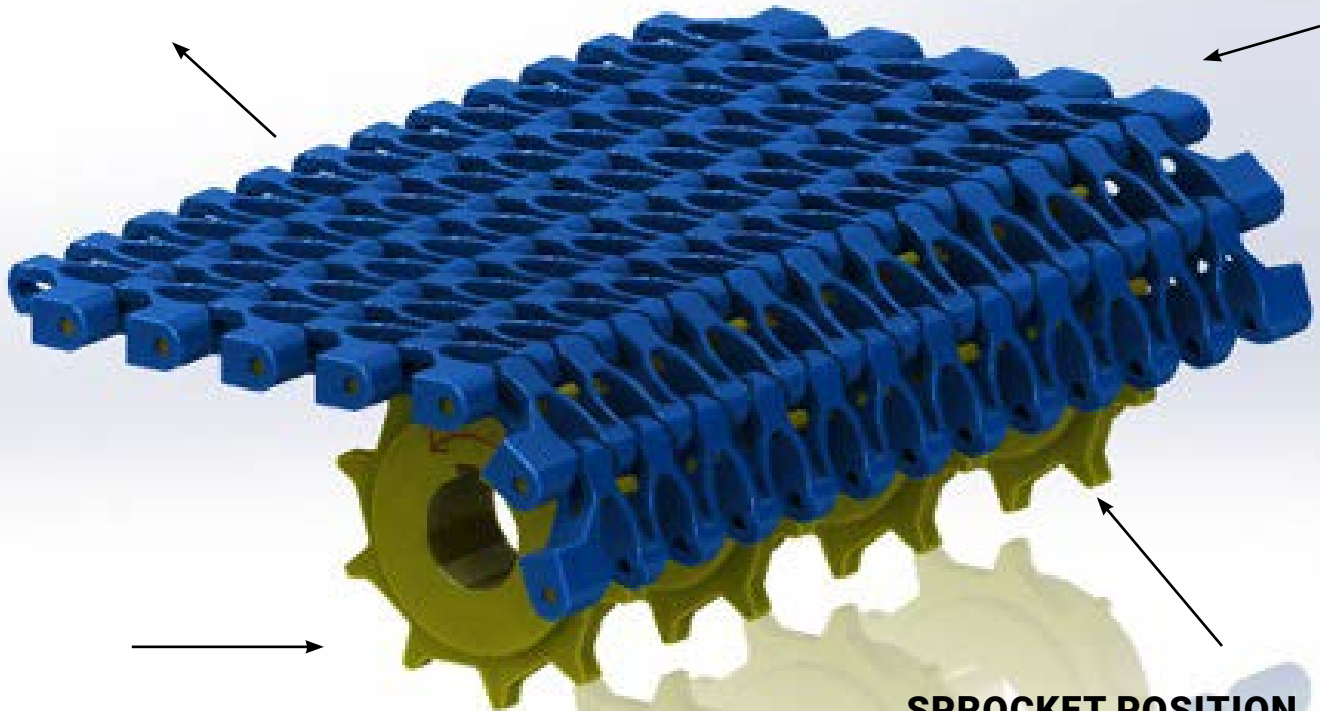
SPROCKET DIRECTION

# Sprocket & Chain Direction

3030 IDLER END

CHAIN DIRECTION

CHAIN POSITION

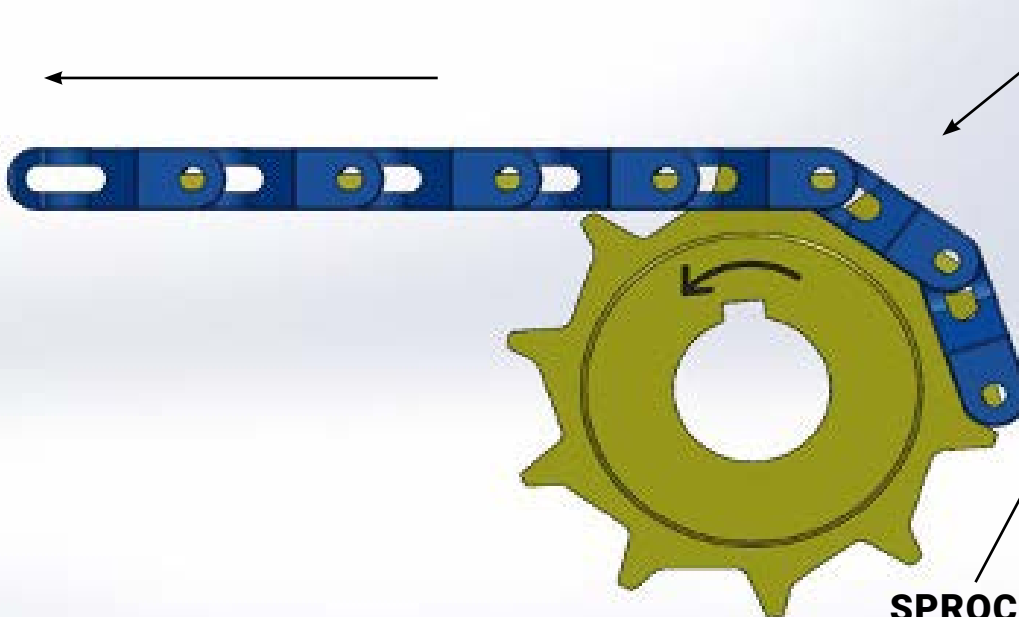


SPROCKET DIRECTION

SPROCKET POSITION

CHAIN DIRECTION

CHAIN POSITION



SPROCKET DIRECTION

# 4735 / 4736

## With Pusher / Side Guides & High Friction Link

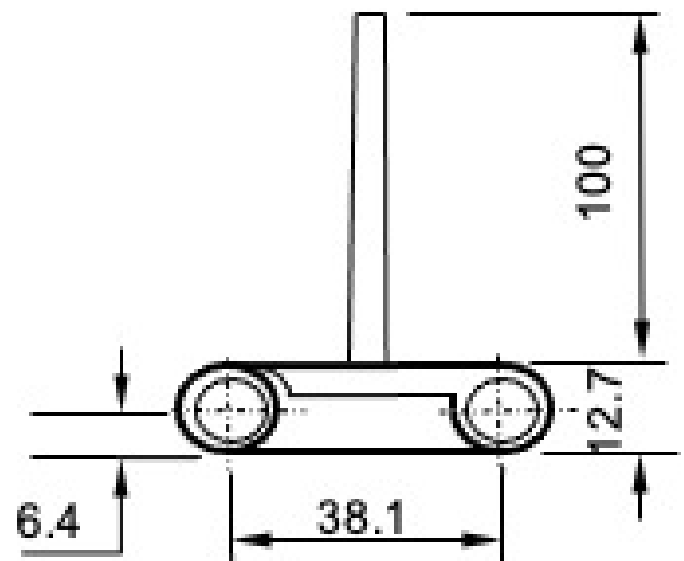
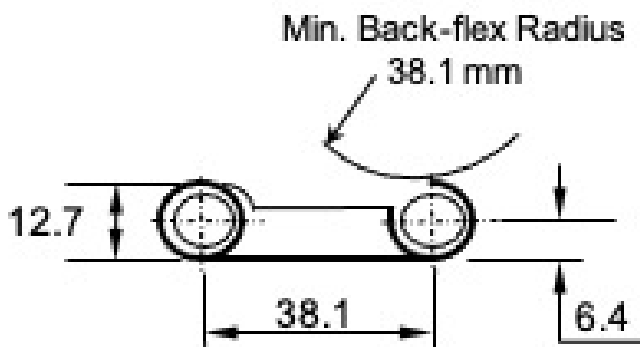
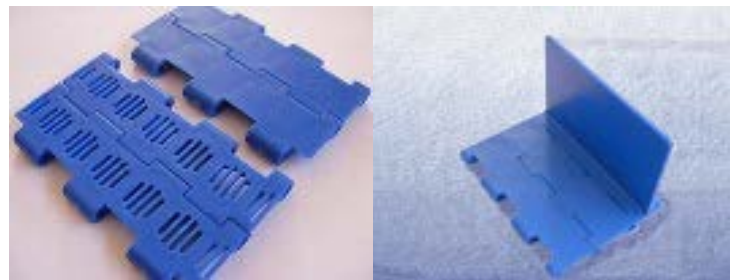


# Chain Data

Pitch	38.1mm (1 1/2") Straigh Running			Approximate Weigh (Kg/m <sup>2</sup> )	
Open Area	4735	2%	Solid Top	POM ± 9.15	PP ± 6.20
Open Area	4736	2%	Perforated Top	POM ± 8.00	PP ± 5.55

Materials Used	LF	WAC	BAC	SP	WPP	BPP
	POM			Polypropylene		
Colours	Brown	White	Blue	Grey	White	Blue
Nominal Strength	17500N/m	17500N/m	17500N/m	17500N/m	8750N/m	8750N/m

	POM	Polypropylene
In Air	-40°C to +80°C	5°c to 104°C
In Hot Water	-40°C to +65°C	5°c to 104°C
Pin Material	Polypropylene	
Pin Retention	Hot Formed Heads	

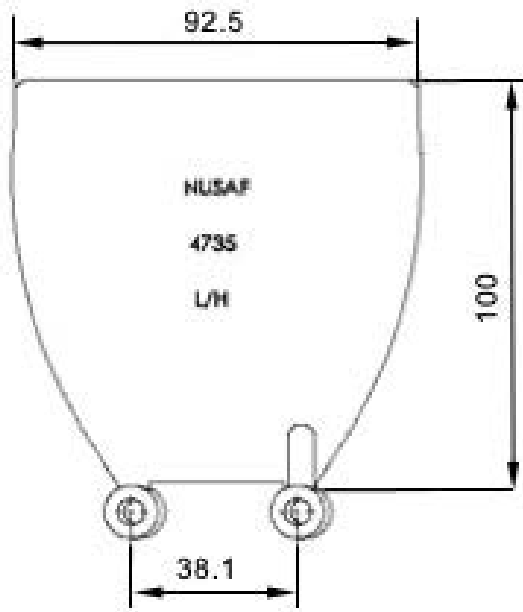


## PUSHER ATTACHMENTS

Material Used	Code	Height	Colour
LF	LF 4735	100mm	Brown
POM	WAC 4735	100mm	Blue
	BAC 4735	100mm	White
	SP	100mm	Grey
PP	WPP 4735	100mm	White
	BPP 4735	100mm	Blue

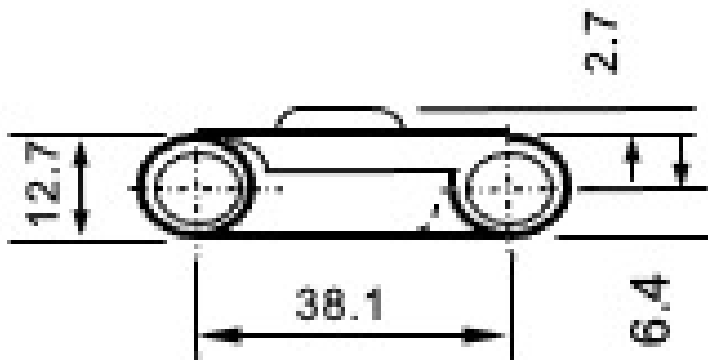
# Side Guides

Materials Used	Code	Height	Colour
Polypropylene			
POM	WAC 4735 SG	100mm	White
	BAC 4735 SG	100mm	Blue
PP	WPP 4735 SG	100mm	White
	BPP 4735 SG	100mm	Blue



## HIGH FRICTION LINK

Rubber	TPE 60 Shore Hardness
	TPE 80 Shore Hardness





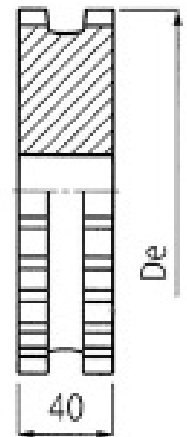
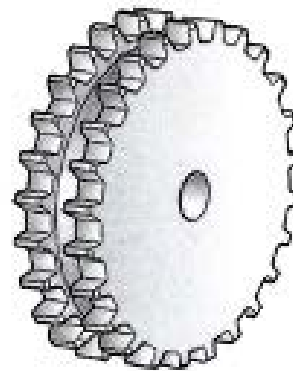
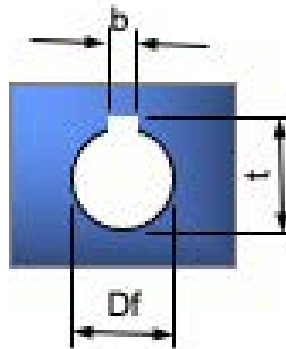
# Sprocket Data

Code	No Of Teeth	Pitch Dia (Dp)	Outside Dia (De)
KU 4735 T17 R...	17	105.48	104.7
KU 4735 T19 R...	19	117.35	117.1
KU 4735 T21 R...	21	129.26	130.0
KU 4735 T25 R...	25	153.21	154.2
KU 4735 T27 R...	27	165.20	166.6

## KEYWAY DIMENSIONS

DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

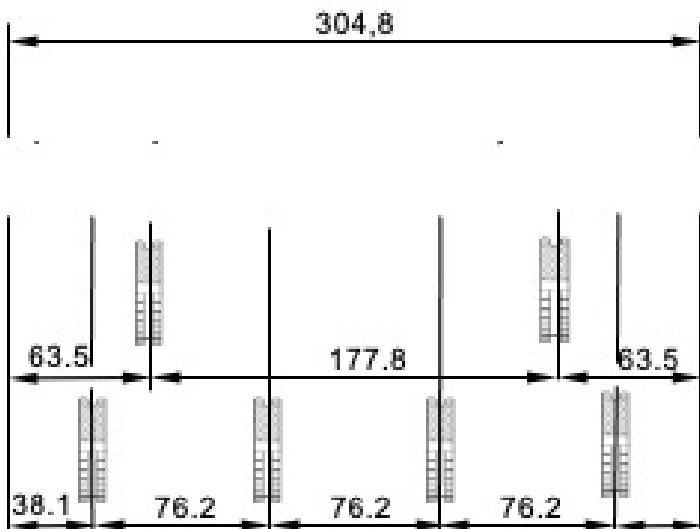


## POSITION & QUANTITY OF SPROCKETS

NUMBER OF DRIVE SPROCKETS:

THE DRAWING INDICATES THE DIFFERENT POSITIONS FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE QUANTITY VARIES WITH THE FACTOR F/F MAX.

Factor F/F Max	Qty Sprockets
0.00 - 0.80	2
0.81 - 1.00	4





# 4839 Raised Rib Chain

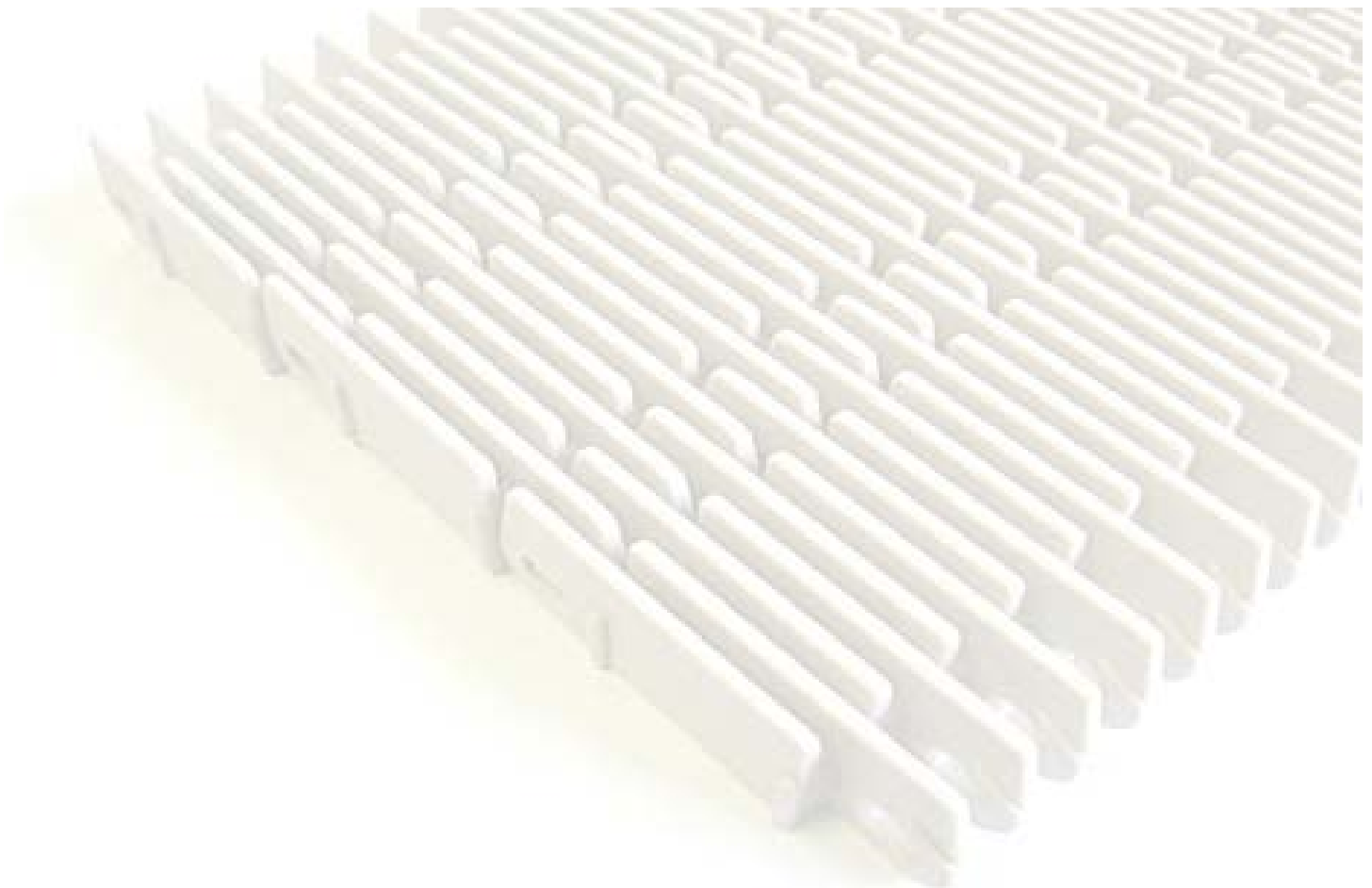
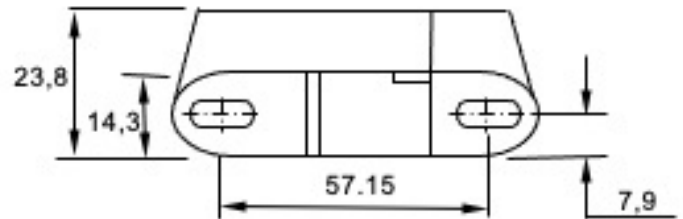


# Chain Data

Pitch	57.15 (2 1/4")	Chain For High Loads		Weight (Kg/m <sup>2</sup> )
Open Area	4839	34%	Raised Rib	PP ± 10

Materials Used	PP
	Polypropylene
Colour	Beige
Nominal Strength	29200N/m

In Air	5°c to 104°C
In Hot Water	5°c to 104°C
Pin Material	Polypropylene
Pin Retention	Hot Formed Heads



# Sprocket Data

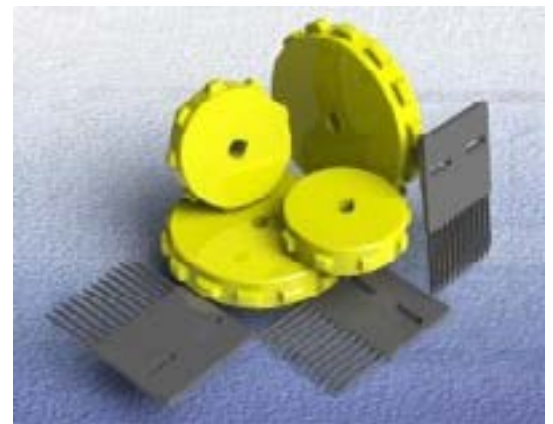
Code	No Of Teeth	Pitch (Dp)	Outside Dia (De)
KU 4839 T9 R...	9	167.08	164.1
KU 4839 T12 R...	12	218.26	218.8
KU 4839 T14 R...	14	256.82	256.5

## POSITION & QUANTITY OF SPROCKETS

**NUMBER OF DRIVE SPROCKETS:**  
**THE DRAWING INDICATES THE DIFFERENT POSITIONS FOR EVERY 304.8mm (12") WIDTH OF CHAIN. THE QUANTITY VARIES WITH THE FACTOR F/F MAX.**

Factor F/F Max	Qty Sprockets
0.00 - 0.40	2
0.41 - 1.00	4

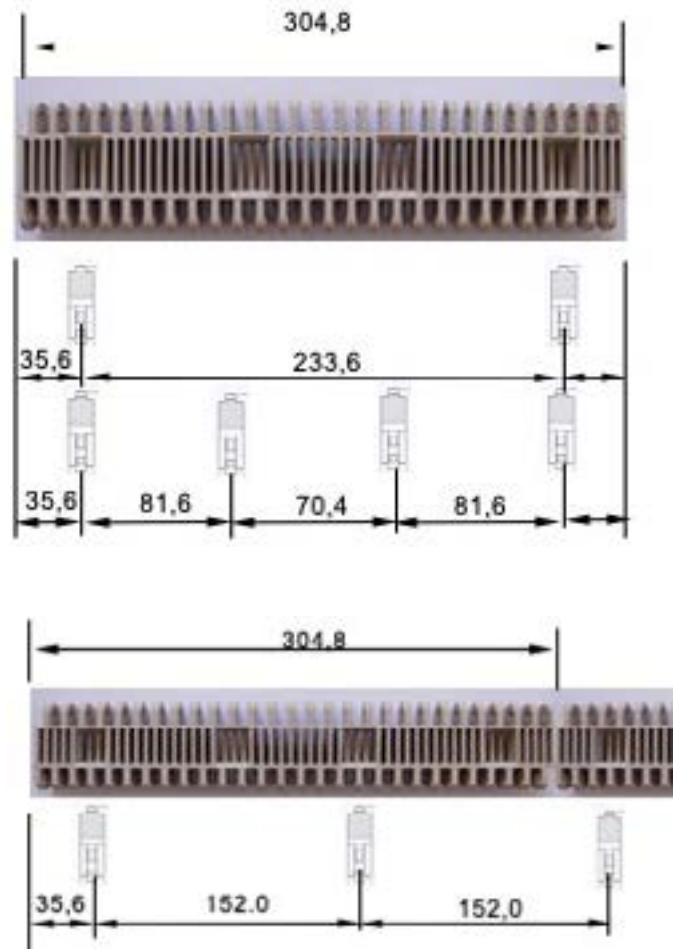
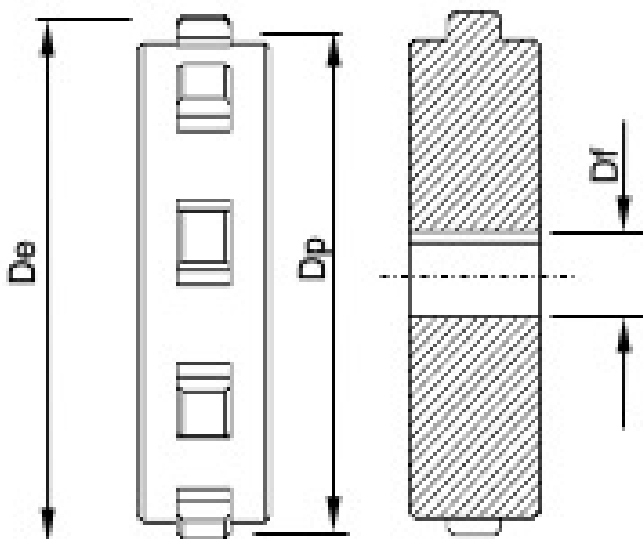
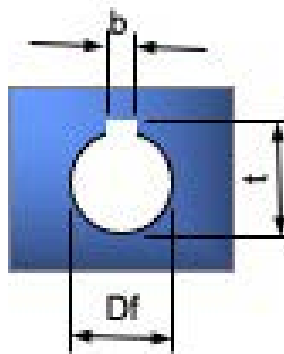
**NUMBER OF RETURN SPROCKETS:**  
**FOR UNI-DIRECTIONAL CONVEYORS, 2 SPROCKETS FOR EVERY 304.8mm OF CHAIN WIDTH. END MODULE WE SUGGEST SYMMETRICAL SPROCKET POSITIONING WITH MINIMUM 152mm.**



## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

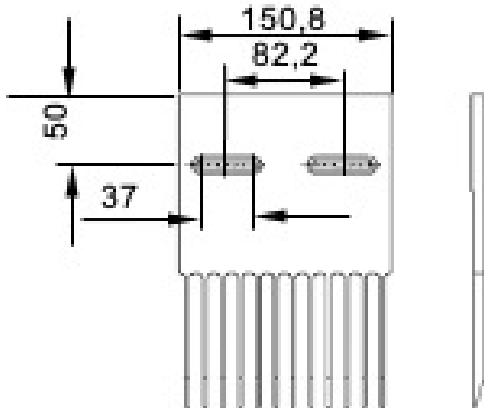
Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	



# Standard Transfer Combs

## MATERIAL CHARACTERISTICS

**PA FV POLYIMIDE REINFORCED (BLACK)  
 COMPARED WITH POLYAMIDE PA: IMPROVED STRENGTH,  
 RIGIDITY AND DIMENSIONAL STABILITY.  
 HIGHER OPERATING TEMPERATURES .**



in Air	-5°C to 120°C
In Hot Water	+100°C

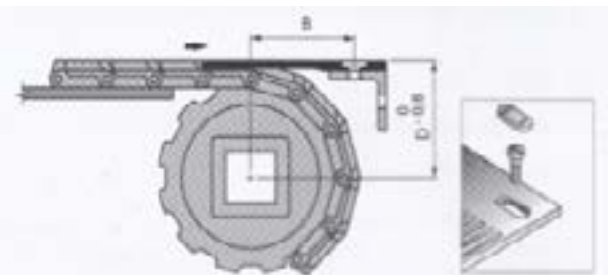
Comb Code	L (mm)	Material
4839 221	221	PA FV Reinforced Polyamide (Black)

**SUPPLIED WITH SCREWS M6 STAINLESS STEEL AND  
 PLUGS (CLIP-IN) FOR THE SLOTTED HOLES.**

## SYSTEM OF INSTALLATION

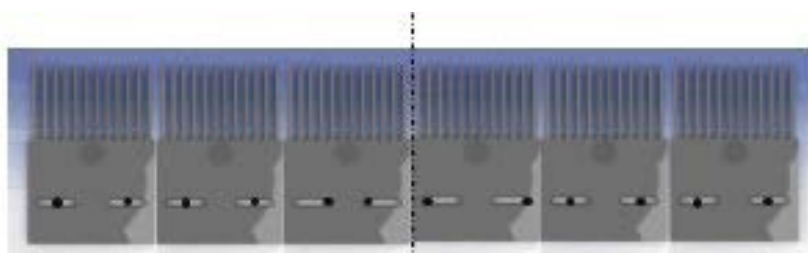
**THE TYPE OF MOUNTING TRANSFER PLATES  
 DEPENDS ON THE OPERATING TEMPERATURES.  
 TRANSFER PLATES MUST HAVE THE POSSIBILITY TO  
 CHANGE LATERAL POSITION IN ACCORDANCE WITH  
 THE THERMAL EXPANSION / CONTRACTION OF THE  
 CHAIN AS THE TEETH MUST STAY BETWEEN THE**

## TRANSFER COMB POSITION



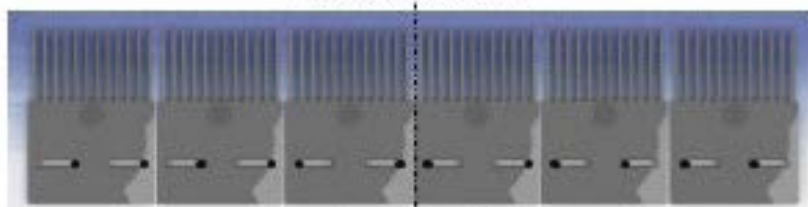
Chain Code	Transfer Comb	B mm	D mm
4839	4839 221	130	(Dp/2) + 15.9

**ALL TRANSFER COMBS ARE DESIGNED  
 TO SAFEGUARD THE CHAIN. THE  
 COMBS WILL BREAK SHOULD THERE  
 BE AN OBSTURCTION BETWEEN THE  
 RAISED RIB CHAIN AND THE COMBS.**



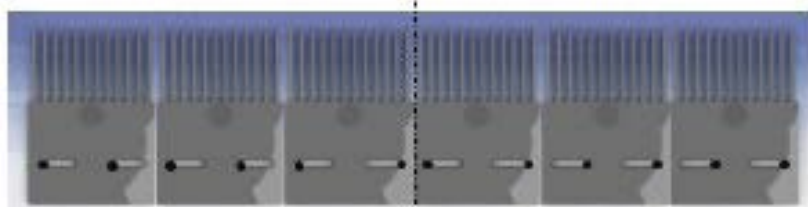
Centre of Chain

**INSTALLATION AT AMBIENT  
 TEMPERATURE (20°C):  
 COMBS 2 & 3 MUST HAVE SCREWS IN  
 THE MIDDLE OF THE SLOTTED HOLES.**



Centre of Chain

**INSTALLATION AT LOW  
 TEMPERATURE:  
 COMBS 2 & 3 COMPENSATE THE  
 CONTRACTION CAUSED BY THE LOW  
 TEMPERATURE.**



Centre of Chain

**INSTALLATION AT HIGH  
 TEMPERATURE:  
 COMBS 2 & 3 COMPENSATE THE  
 EXPANSION CAUSED BY THE HIGH  
 TEMPERATURE.**

# 5020 With Pusher



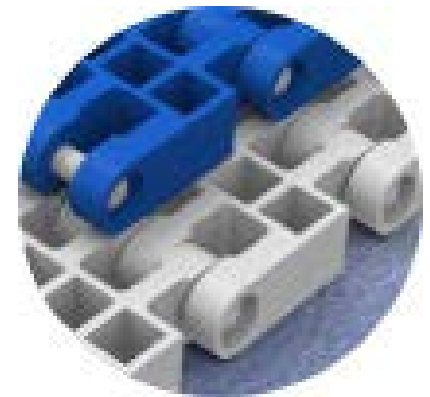
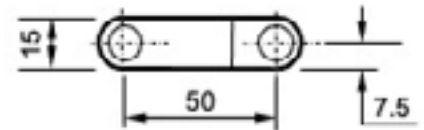
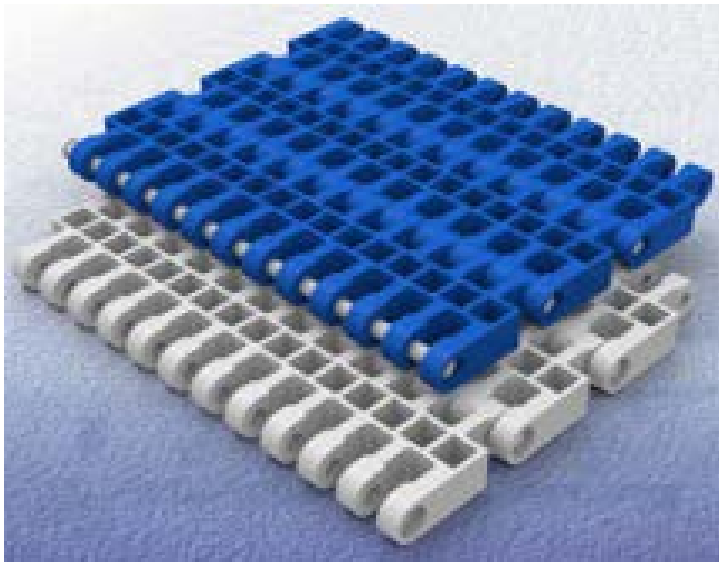
# Chain Data

Pitch	50mm (2")	Straight Running Conveyor Chain	
Open Area	5020	60%	Perforated Top

Materials Used	WAC	BAC	UV	WPP	BPP	PPUV
	POM			Polypropylene		
Colours	White	Blue	Black	White	Blue	Black
Nominal Strength	42000N/m	42000N/m	42000N/m	28000N/m	28000N/m	28000N/m

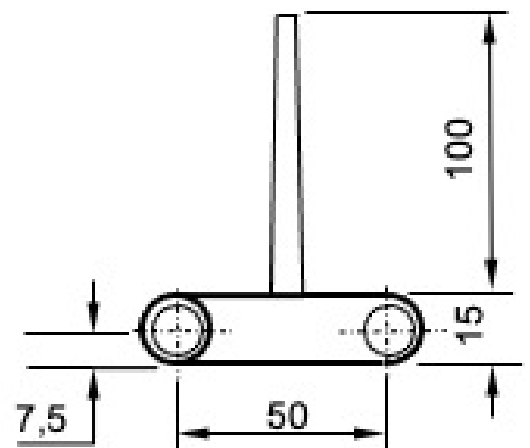
	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Polypropylene	
Pin Retention	Hot Formed Heads	

**POLYETHYLENE AND ANTISTATIC MATERIALS UPON REQUEST.**



## PUSHER ATTACHMENTS

Material Used	Code	Height	Colour
POM	WAC 5020	100mm	White
	BAC 5020	100mm	Blue
	UV 5020	100mm	Black
PP	WPP 5020	100mm	White
	BPP 5020	100mm	Blue
	PPUV 5020	100mm	Black





# Sprocket Data

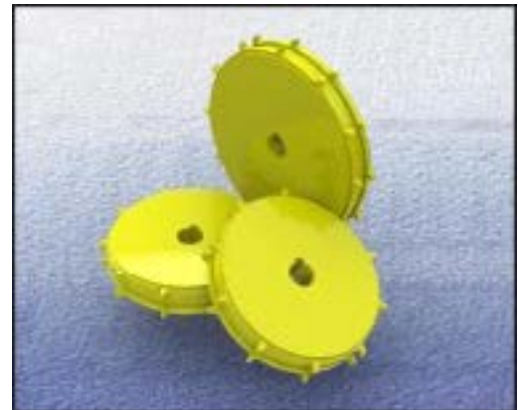
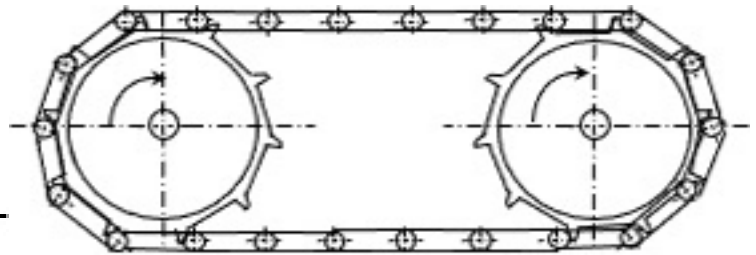
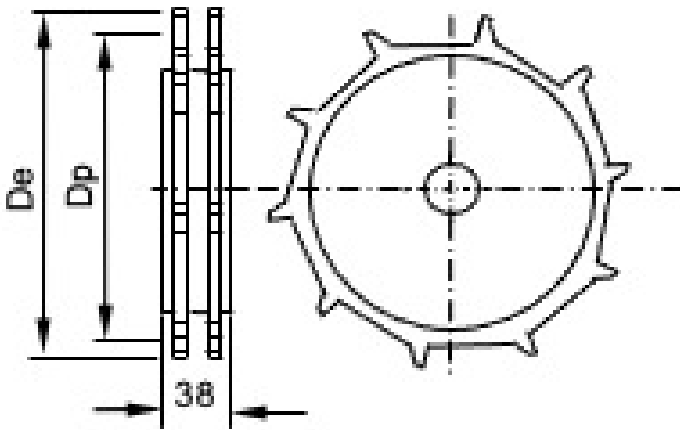
Code	No Of Teeth	Pitch (Dp)	Outside Dia (De)
KU 5020 T08 R...	8	130	139
KU 5020 T10 R...	10	161	170
KU 5020 T12 R...	12	190	199

**MATERIAL: POLYAMIDE (PA) YELLOW**

**KEYWAY SEAT UNI 6604-69**

**ACETAL AND POLYETHYLENE MATERIALS UPON REQUEST**

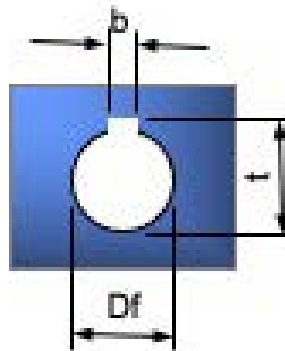
**NOTE: THE KU 5020 T10 AND T12 CAN BE FITTED ONTO MOTORIZED DRUMS**



## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

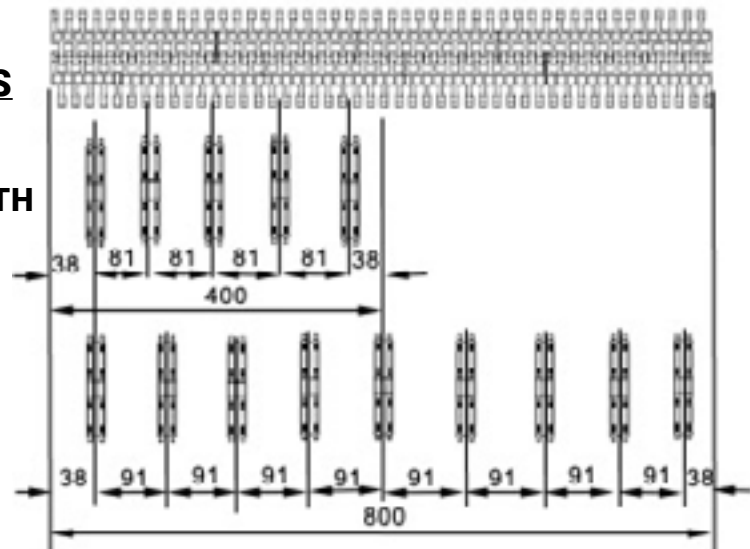


## POSITION & QUANTITY OF SPROCKETS

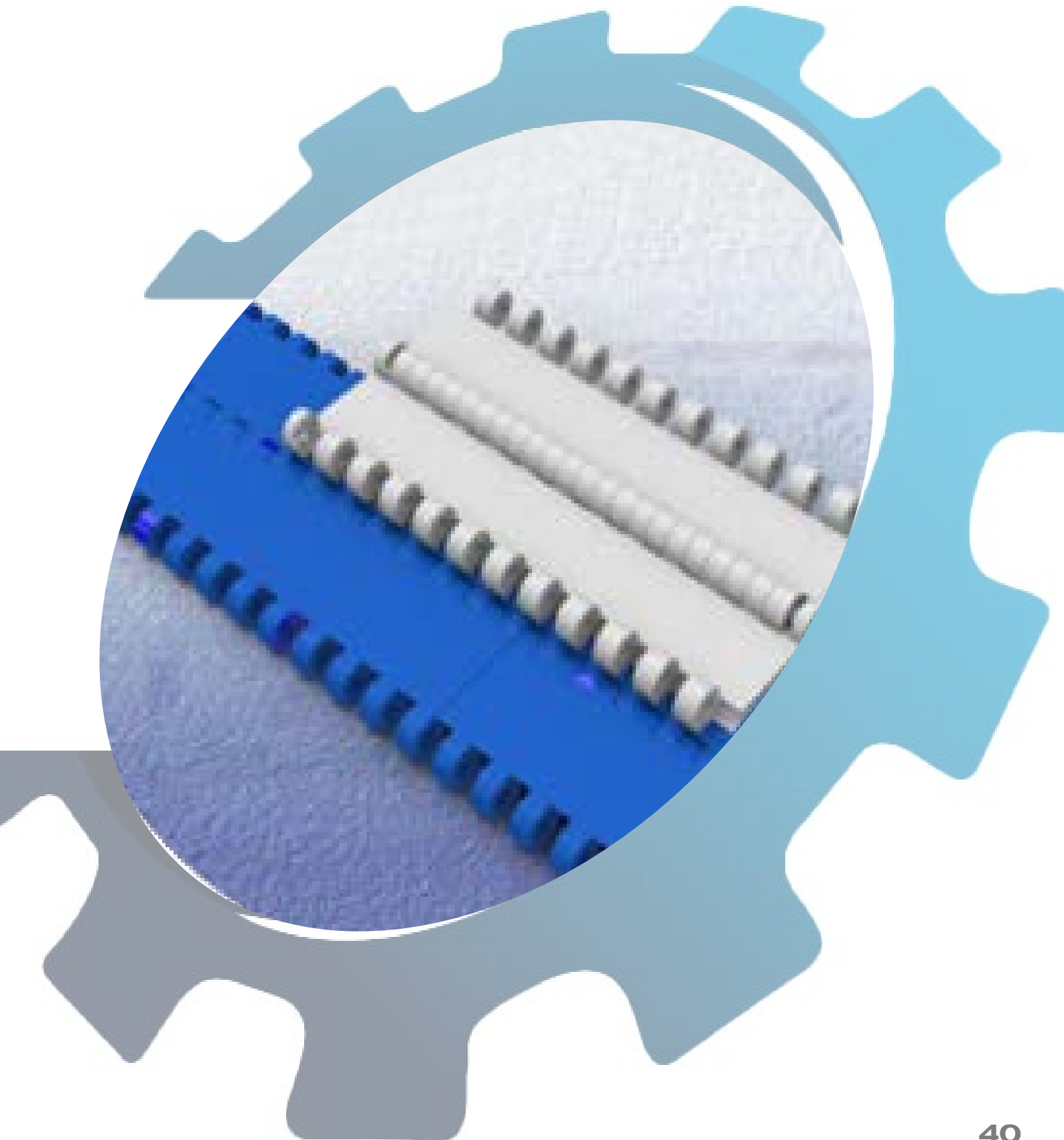
**NUMBER OF DRIVE SPROCKETS:**

**FOR EVERY TYPE OF WORKING LOAD 4**

**SPROCKETS FOR EVERY 400mm OF CHAIN WIDTH  
REQUIRED.**



# 5035 With Pusher



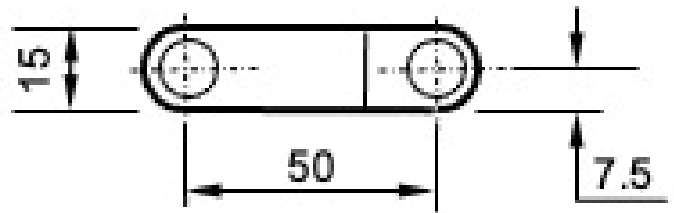
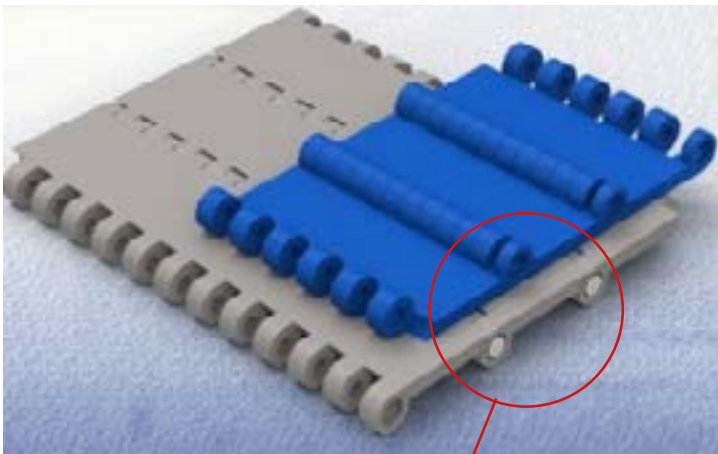


# Chain Data

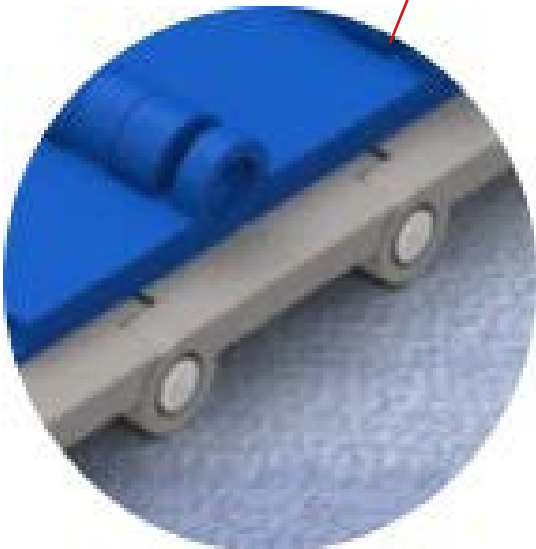
Pitch	50mm (2")	Straight Running Conveyor Chain Solid Top		
Open Area	5035	2%	Approximate weight (Kg/m <sup>2</sup> )	
			POM ± 10.8	PP ± 6.6

Materials Used	WAC	BAC	WPP	BPP	PPUV
	POM		Polypropylene		
Colours	White	Blue	White	Blue	Black
Nominal Strength	37000N/m	37000N/m	33000N/m	33000N/m	33000N/m

	POM	Polypropylene
In Air	-40°C to +80°C	5°C to 104°C
In Hot Water	-40°C to +65°C	5°C to 104°C
Pin Material	Polypropylene	
Pin Retention	Hot Formed Heads	



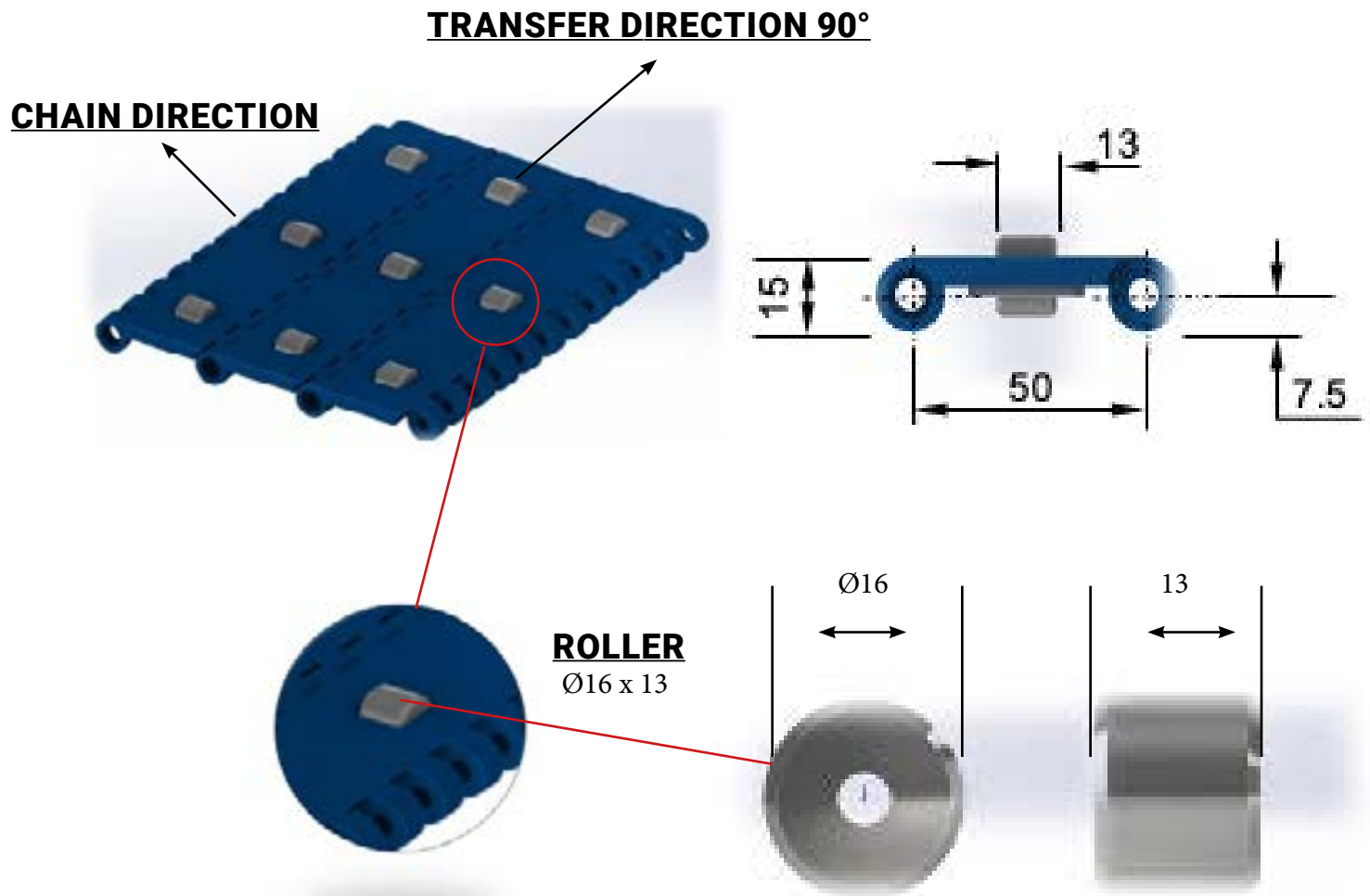
**HOT FORMED HEADS OR PLUGS**



# Chain Data

Pitch	50mm (2")	Straight Running Conveyor Chain Solid Top		
Open Area	5035 TR	2%	Approximate weight (Kg/m <sup>2</sup> )	
			POM ± 10.8	PP ± 6.6

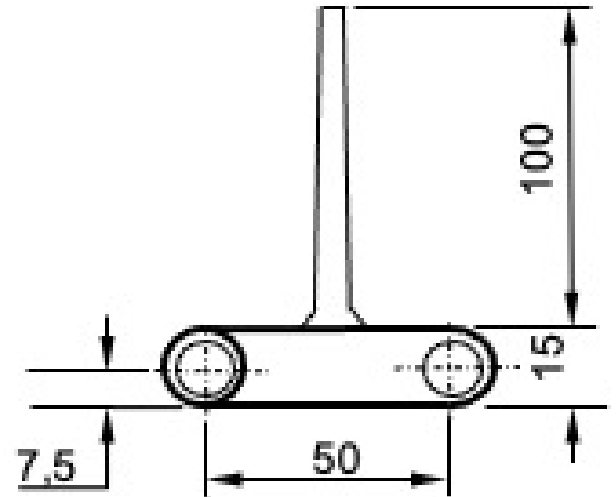
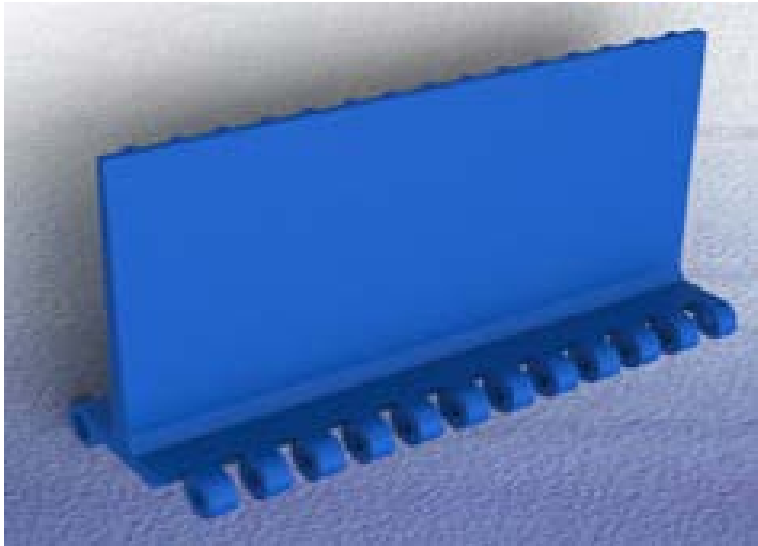
Materials Used	WAC	BAC	WPP	BPP	PPUV
	POM		Polypropylene		
Colours	White	Blue	White	Blue	Black
Nominal Strength	37000N/m	37000N/m	33000N/m	33000N/m	33000N/m



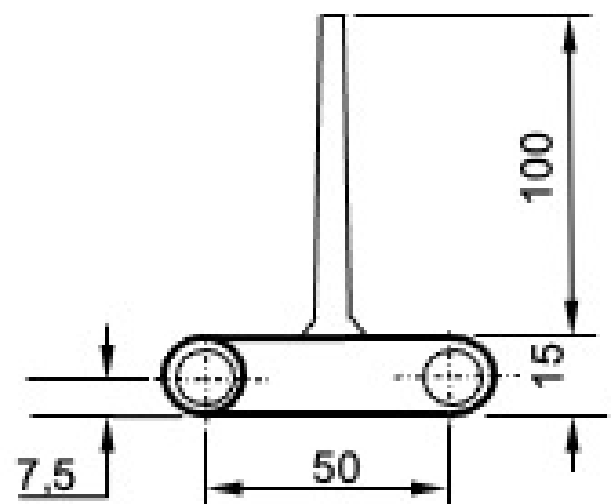
# Pusher Attachments

Material Used	Code	Height	Colour
POM	WAC 5035	100mm	White
	BAC 5035	100mm	Blue
PP	WPP 5035	100mm	White
	BPP 5035	100mm	Blue

**POLYETHELYNE AND ANTISTATIC MATERIALS UPON REQUEST.**



**STRAIGHT PUSHER WITHOUT RIBS**



**RE-INFORCED PUSHER WITH RIBS**

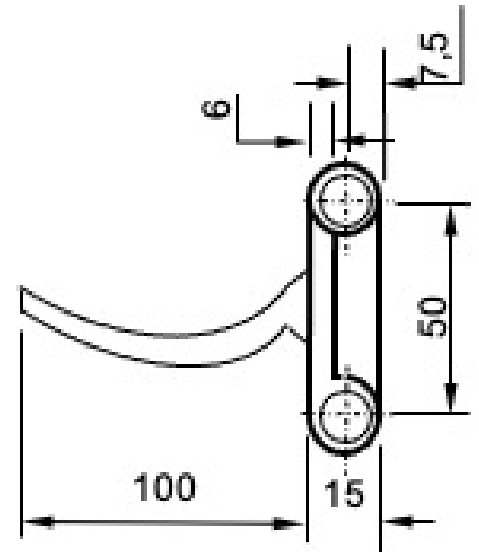
# Pusher Attachments

Material Used	Code	Height	Colour
POM	WAC 5035	100mm	White
	BAC 5035	100mm	Blue
PP	WPP 5035	100mm	White
	BPP 5035	100mm	Blue

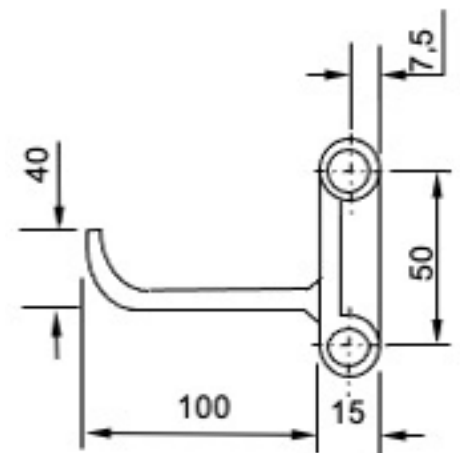
**POLYETHELYNE AND ANTISTATIC MATERIALS UPON REQUEST.**



**CURVE TYPE RIBBED PUSHER**

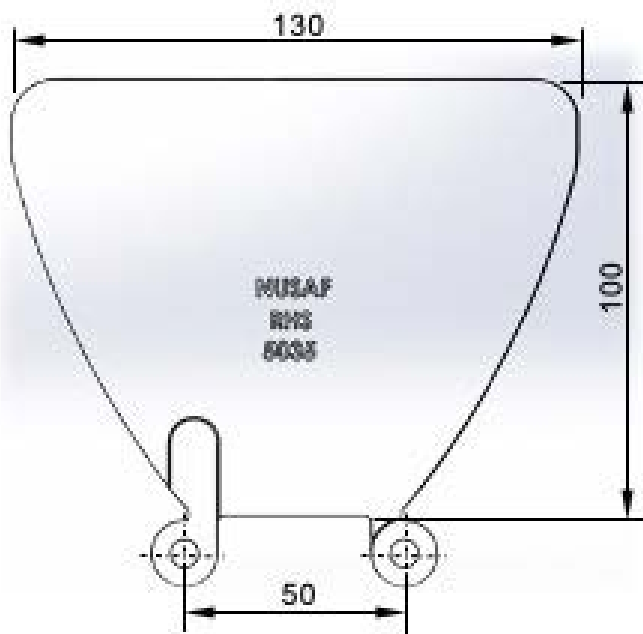


**BUCKET TYPE RIBBED PUSHER**

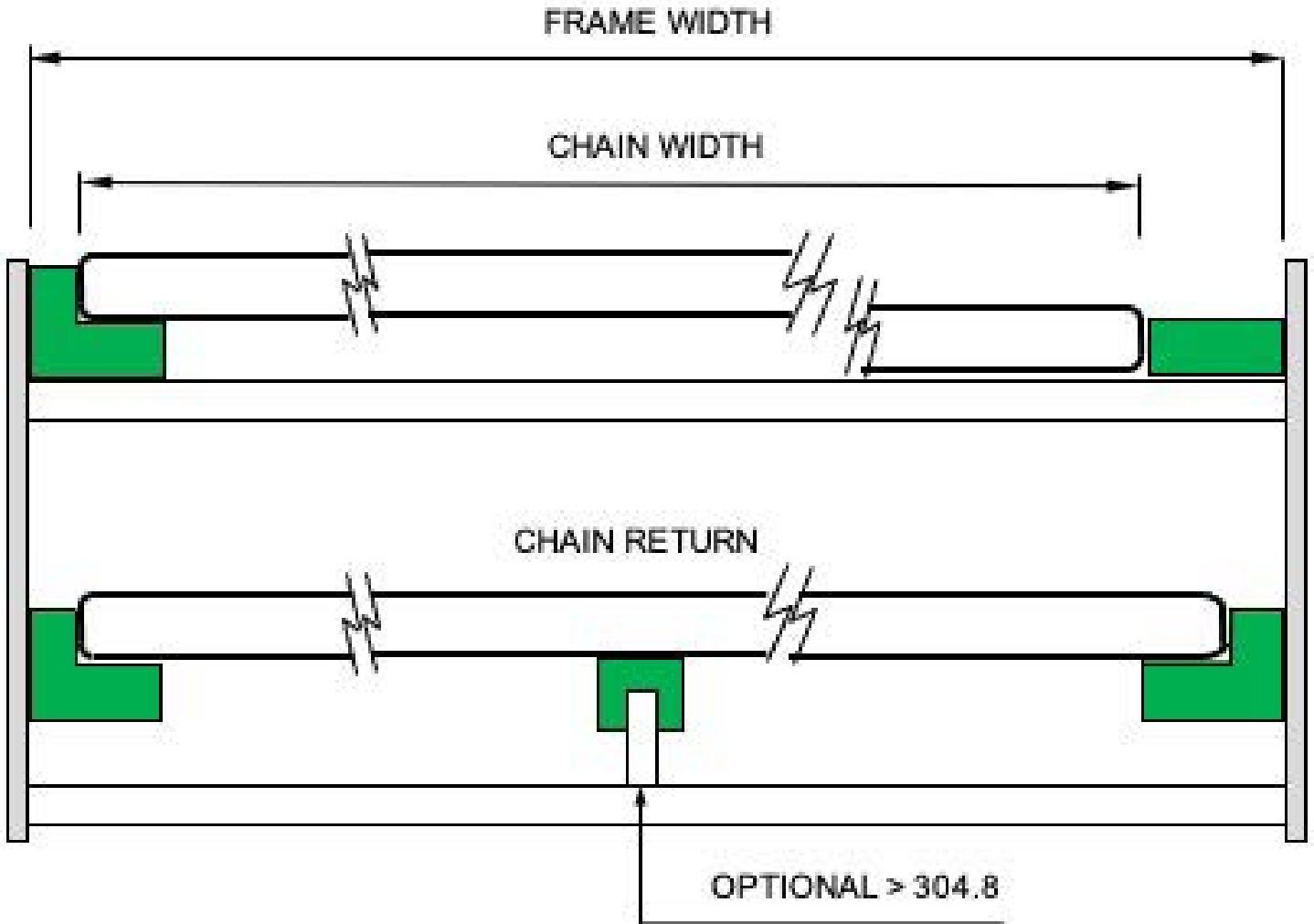


# Side Guides

Materials Used	Code	Height	Colour
	Polypropelyne		
POM	WAC 5035 SG	100mm	White
	BAC 5035 SG	100mm	Blue
PP	WP 5035 SG	100mm	White
	BPP 5035 SG	100mm	Blue



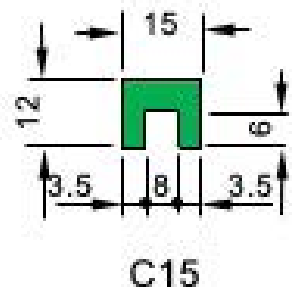
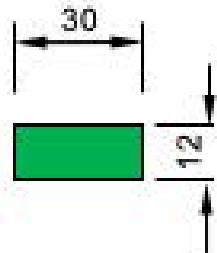
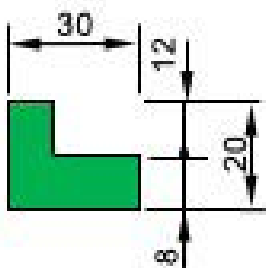
# Straight Running Chain Section Guidelines



**\* DYNAMIC ROLLERS CAN BE USED ON THE RETURN.**

**NOTE: FOR FRICTION FACTORS BETWEEN WEARSTRIPS AND CHAIN, SEE ENGINEERING MANUAL.**

**M6 BRASS INSERTS SHOULD BE USED ON BENDS (NOT SUPPLIED)**



# Sprocket Data

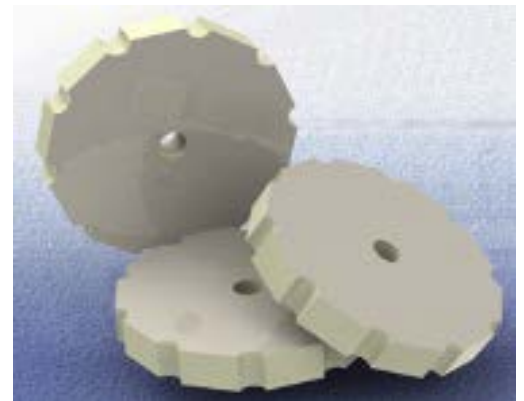
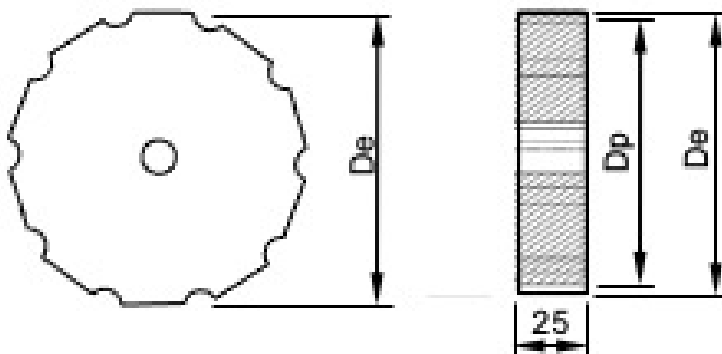
Code	No Of Teeth	Pitch (Dp)	Outside Dia (De)
KU 5035 T08 R...	8	130.6	123.8
KU 5035 T10 R...	10	161.8	155.5
KU 5035 T12 R...	12	194.2	184.7
KU 5035 T15 R...	15	241.5	237.9
KU 5035 T16 R...	16	257.6	253.8

**MATERIAL: POLYAMIDE (PA) YELLOW**

**KEYWAY SEAT UNI 6604-69**

**ACETAL AND POLYETHYLENE MATERIALS UPON REQUEST**

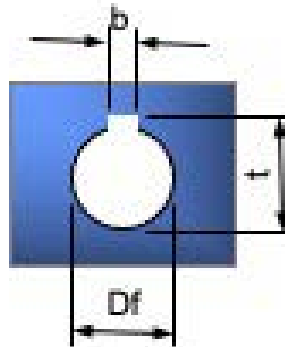
**NOTE: THE KU 5035 T10 AND T12 CAN BE FITTED ONTO MOTORIZED DRUMS**



## KEYWAY DIMENSIONS

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	

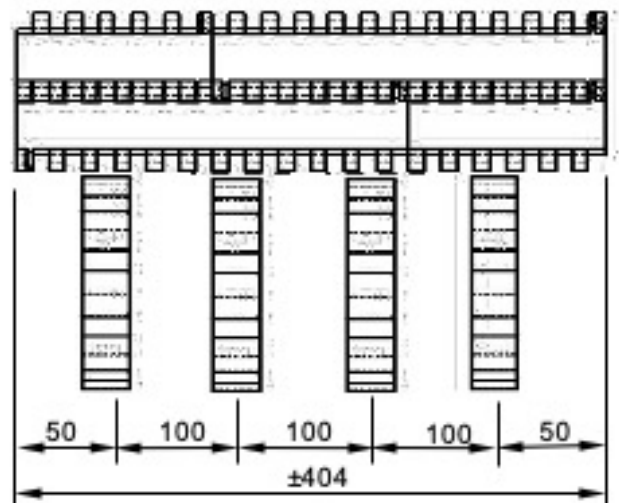


## POSITION & QUANTITY OF SPROCKETS

**NUMBER OF DRIVE SPROCKETS:**

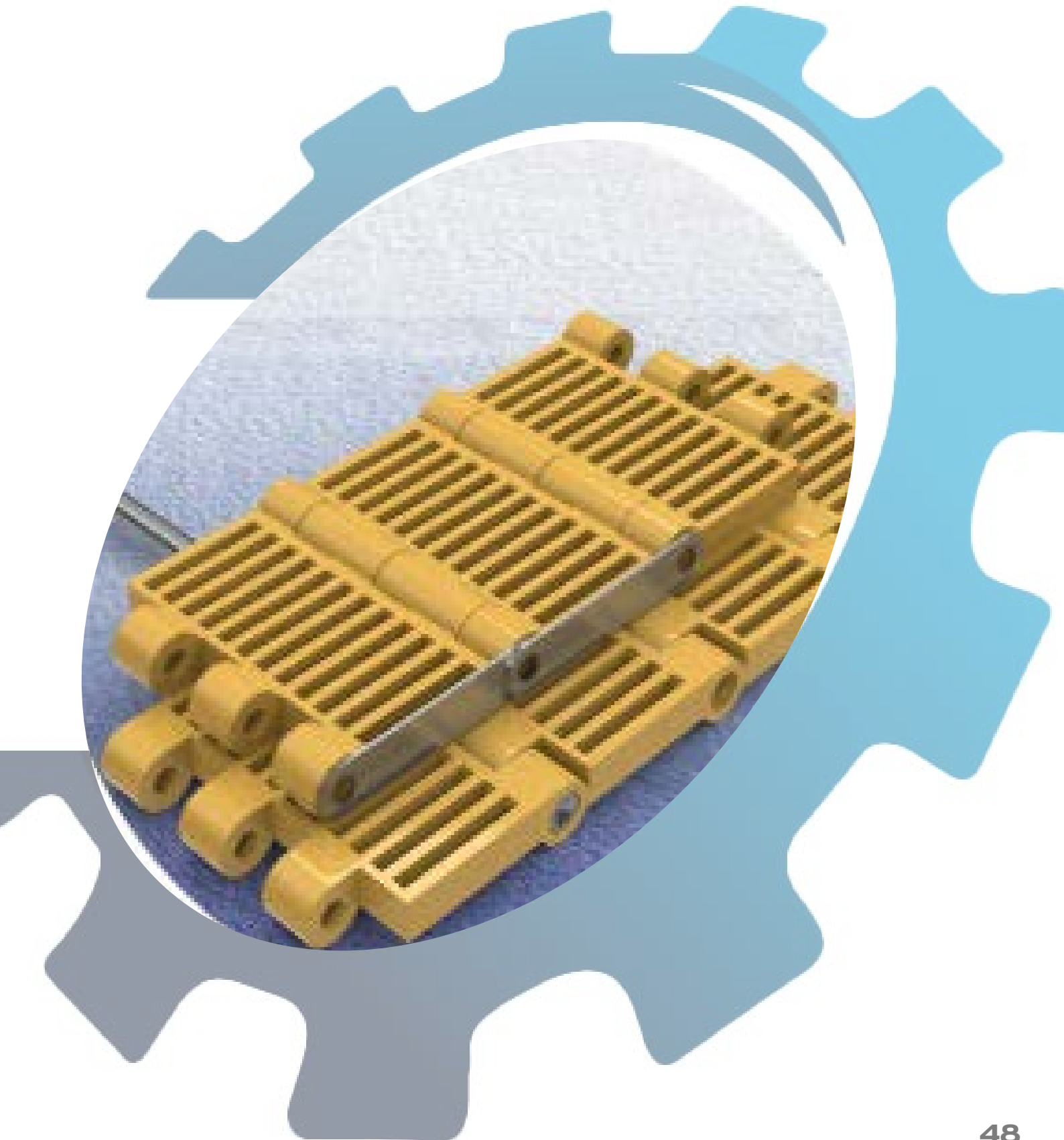
**FOR EVERY TYPE OF WORKING LOAD 4**

**SPROCKETS FOR EVERY 400mm OF CHAIN WIDTH  
REQUIRED.**



# 6392

## High Temperature Chain





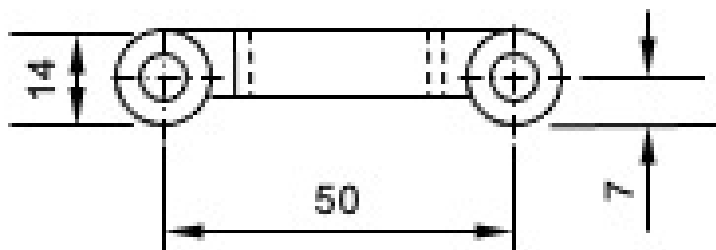
# Chain Data

Pitch	50mm (1 31/32")	Increased Resistance Against High Temperatures	
Open Area	YHT 6392	48%	Perforated Top

Materials Used	YHT
Colour	Yellow
Nominal Strength	15000 N/m
Weight (Kg/m <sup>2</sup> )	±8.75*



In Air	5°C to 180°C
Pin Material	Stainless Steel Aisi 304
Tension Plate Material	Stainless Steel Aisi 304
Pin Retention	Flaired Pin



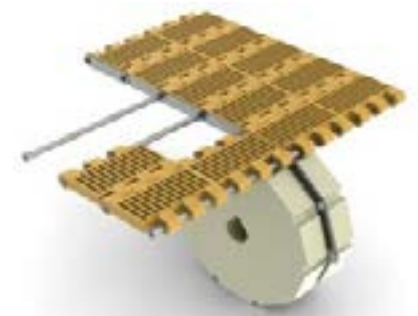
**CHAIN WITHOUT TENSION PLATES**  
SUITABLE FOR LIGHT DUTY APPLICATIONS.  
THE CHAINS WITHOUT TENSION PLATES ARE  
ASSEMBLED WITH THERMOPLASTIC PINS.

## **CHAIN WITH TENSION PLATES**

THE TENSION PLATES GIVE THE CHAIN AN INCREASED DIMENSIONAL STABILITY. TRANSVERSAL STABILITY IS ENSURED BY THE METAL CHAIN PINS.

\* = WEIGHT OF TENSION PLATES TO BE ADDED  
(1 ROW IS 0.3kg/m)

\*\* = THE LOAD CAPACITY OF THE CHAIN DEPENDS ON THE NUMBER OF TENSION PLATES ASSEMBLED IN THE CHAIN. THE MAXIMUM WORKING LOAD FOR EVERY ROW OF TENSION PLATES IS: 1500N, WITH 3 ROWS OF TENSION PLATES 4500N etc. ONE ROW OF TENSION PLATES CAN BE APPLIED EVERY 75mm OF WIDTH.



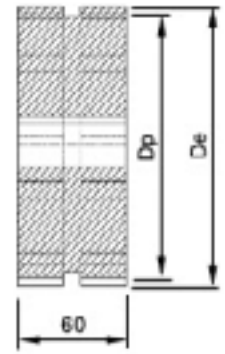
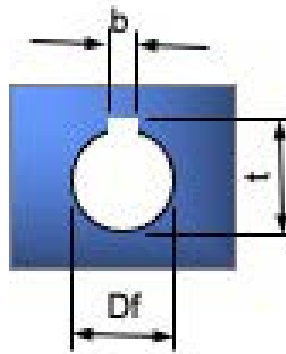
# Sprocket Data

Code	No Of Teeth	Pitch (Dp)	Outside Dia (De)	Weight (Kg)
KU 6394 T08 R...	8	130.64	120.7	±0.59
KU 6394 T10 R...	10	161.80	153.9	±0.98

## **KEYWAY DIMENSIONS**

**DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.**

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	



## **POSITION & QUANTITY OF SPROCKETS**

**NUMBER OF DRIVE AND RETURN SPROCKETS. (CHAINS WITH TENSION PLATES):**

**THE SPROCKETS (WITH THE EXCEPTION OF THE CENTRAL SPROCKET) TO BE POSITIONED IN LINE WITH THE TENSION PLATES IN THE CHAIN. THE CENTRAL SPROCKET SERVES AS A SUPPORT OF THE CHSAIN.**

**NUMBER OF DRIVE AND RETURN SPROCKETS (CHAINS WITHOUT TENSION PLATES):**

**FOR WORKING LOADS UP TO 100% OF THE MAXIMUM WORKING LOAD, THE SPROCKETS SHOULD BE PLACED AT A CENTRE DISTANCE OF 75mm.**

**FOR WORKING LOADS OF UP TO 50% OF THE MAXIMUM WORKING LOAD, THE PROCKETS SHOULD BE PLACED AT A DECENTRE DISTANCE OF 150mm.**

**ALL SPROCKETS SHOULD BE KEYED ON THE SHAFT. THE CHAIN SHOULD BE HELD IN POSITION BY MEANS OF THE WARESTRIP AT THE SIDES OF THE CHAIN.**



# 7735

## Special Performance Chain



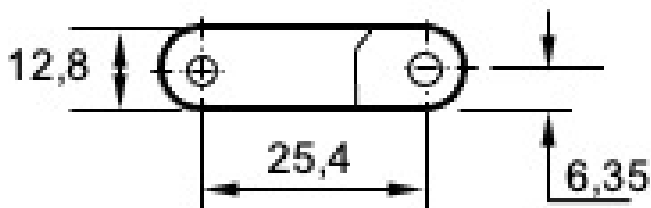
# Chain Data

Pitch Of Chain	25.4mm (1")		Approximate Weight (Kg/m <sup>2</sup> )
Open Area	7753 (3%)	Solid Top	POM ±13.56
Open Area	7736 (8%)	Perforated Top	POM ±13.27

Materials Used	SP
	Special Performance
Colour	Grey
Nominal Strength	43040 N/m



In Air	5°C to 180°C
In Hot Water	+65°C
Pin Material	Acetal
Pin Retention	Plug



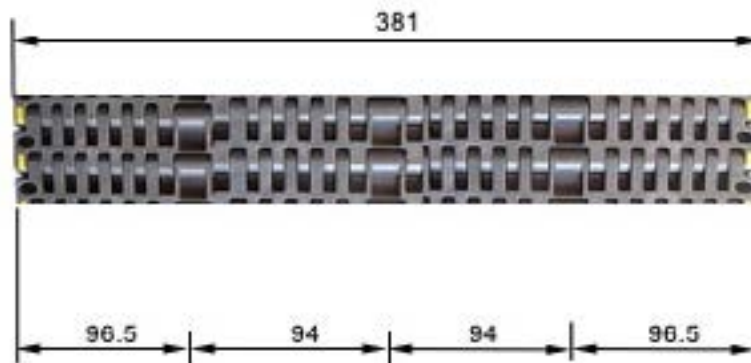
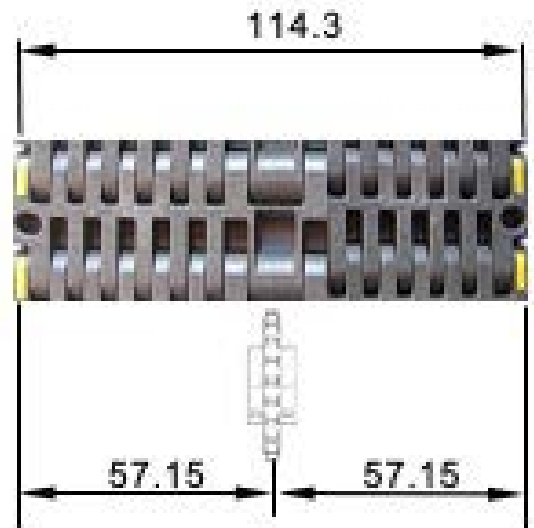
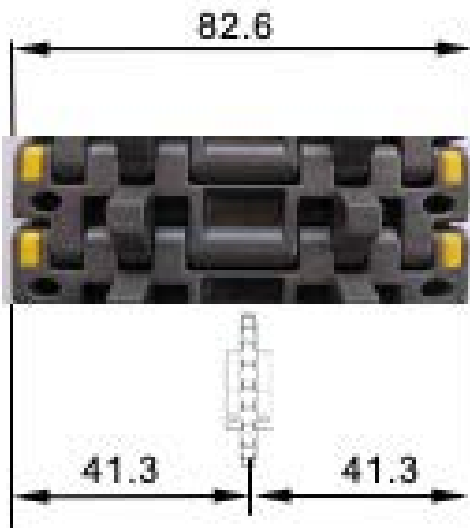
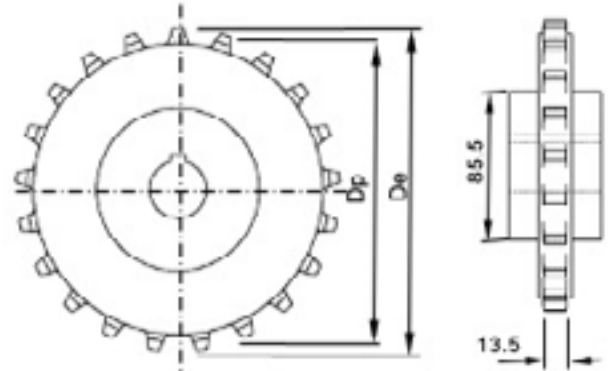
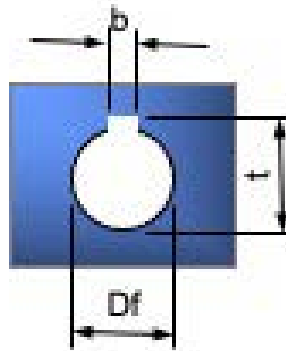
# Sprocket Data

Code	No Of Teeth	Pitch (Dp)	Outside Dia (De)	Weight (Kg)
KU 7735 T16 R...	16	130.20	130.6	0.33
KU 7735 T18 R...	18	146.28	146.9	0.38
KU 7735 T21 R...	21	170.43	170.7	0.44

## KEYWAY DIMENSIONS

DIMENSIONS ACCORDING TO UNI 6604-69/ISO 773.

Df mm	b mm		t mm	
	nom	toll	nom	toll
25	8		28,3	
30	8		33,3	
35	10	J9	38,3	+0.2
40	12		43,3	0
45	12		48,4	
50	14		53,8	



# Engineering Manual

## Chain Support For Conveyors

### MATERIAL CHARACTERISTICS

#### WEARSTRIPS MADE FROM METAL:

A HIGHER COEFFICIENT OF FRICTION THAN PLASTIC MATERIALS. RECOMMENDED FOR ABRASIVE ENVIRONMENTS AND HIGH TEMPERATURES.

#### CARBON STEEL:

IT IS RECOMMENDED TO USE A COLD-ROLLED TYPE OF STAINLESS STEEL WITH A SURFACE ROUGHNESS OF 1.6-3.2 WITH A SURFACE HARDNESS OF HRC 25-30. LUBRICANTS MUST CONTAIN AN ANTI CORROSION ADDITIVE.

#### OPERATING TEMPERATURES:

IN AIR: -40°C + 80°C

IN HOT WATER: +65°C

#### STAINLESS STEEL:

IT IS RECOMMENDED TO USE A COLD-ROLLED TYPE OF STAINLESS STEEL WITH A SURFACE ROUGHNESS OF 1.6-3.2 WITH A MINIMUM HARDNESS OF HRC 25. AUSTENITIC AND FERRITIC TYPES OF STAINLESS STEEL HAVE THE SAME WEAR RESISTANCE, HOWEVER AUSTENITIC STEEL HAS A HIGHER CHEMICAL RESISTANCE.

#### OPERATING TEMPERATURES:

IN AIR: -70°C + 400°C

IN HOTWATER: +120°C

#### PLASTIC WEARSTRIP MATERIAL:

A LOWER COEFFICIENT OF FRICTION COMPARED WITH METAL. SIMPLY ASSEMBLY, QUIET OPERATION. RECOMMENDATION: FOR POLYPROPYLENE CHAINS WHT, WHICH ARE RUNNING DRY, ALWAYS APPLY PLASTIC WEARSTRIP.

#### NYLATRON:

POLYAMIDE WITH MPLYDISULFIDE ADDITIVE. THE BEST SOLUTION FOR CONVEYORS, WHICH ARE OPERATING WITHOUT LUBRIFICATION. IT HAS A LOW COEFFICIENT OF FRICTION AND HIGHER WEAR RESISTANCE. HOWEVER ABSORBS HUMIDITY AND EXPANDS.

#### OPERATING TEMPERATURES:

IN AIR: 0 + 80°C

IN HOT WATER: +65°C

#### NYLATRON:

POLYAMIDE WITH MOLYDISULFIDE ADDITIVE. THE BEST SOLUTION FOR CONVEYORS, WHICH ARE OPERATING WITHOUT LUBRIFICATION. IT HAS A LOW COEFFICIENT OF FRICTION AND HIGH WARE RESISTANCE. HOWEVER ABSORBS HUMIDITY AND EXPANDS.

#### OPERATING TEMPERATURES:

IN AIR: -40°C + 80°C

IN HOT WATER: + 65°C

**UHMWPE:**

**POLYETHYLENE WITH A MOLECULAR WEIGHT OF 1000 000. SUITABLE FOR DRY AND LUBRICATED APPLICATIONS. UNDER DRY CONDITIONS THE WEAR RESISTANCE IS THE SAME AS NYLATRON. NO MOISTURE ABSORPTION. HAS A HIGH CHEMICAL RESISTANCE. THE RIGIDITY IS LOWER THAN NYLATRON, MAY DEFLECT UNDER ELEVATED LOADS. NOT RECOMMENDED FOR ABRASIVE APPLICATIONS.**

**OPERATING TEMPERATURES:**

**IN AIR -40°C + 80°C**

**IN HOT WATER + 70°C**

**COEFFICIENT OF LINER EXPANSION BETWEEN +20 E 120°:2X10<sup>-4</sup>**

**THERMAL EXPANSION AND CONTRACTION**

**WHEN INSTALLING PARALLEL OR HERRINGBONE TYPES OF PATTERN (IN NYLATRON AND UHMWPE) THE THERMAL EXPANSION AND/OR CONTRACTION SHOULD BE CONSIDERED.**

**OTHER INFORMATION:**

**WEARSTRIPS MADE FROM METAL:**

**CHEMICAL RESISTANCE: SEE PAGE 45**

**COEFFICIENT OF FRICTION (FW): SEE PAGE 46**

**SYSTEMS OF CHAIN SUPPORT**

**PARALLEL GUIDES:**

**RECOMMENDED FOR LIGHT-MEDIUM LOADS. CHAINS WITH A WIDTH OF UP TO 1m.**

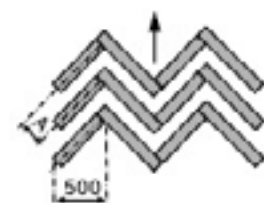
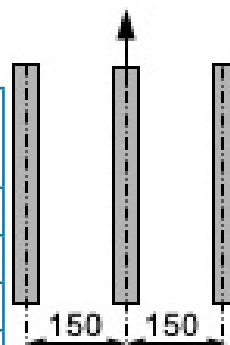
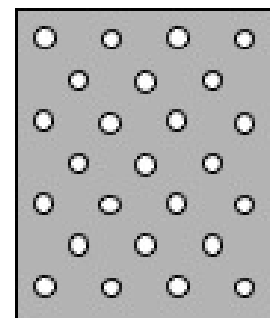
**ECONOMICAL SOLUTION. FOR UNI-AND BIDIRECTIONAL CONVEYORS (WITH CENTRAL DRIVE UNIT).**

**FLAT BED SUPPORT:**

**RECOMMENDED FOR HIGH LOADS. THE SHEET SHOULD BE PERFORATED. MATERIAL IN STAINLESS STEEL OR FORMICA. POLYETHYLENE IS NOT SUITABLE.**

**“HERRINGBONE” TYPE OF SUPPORT.**

**FOR CHAIN WIDTHS BETWEEN 1 - 3m. UNI DIRECTIONAL CONVEYORS WITH HIGH LOADS AND BI-DIRECTIONAL CONVEYORS (WITH CENTRAL DRIVE UNIT). ACCUMULATION TABLES. THE WEAR OF THE CHAIN IS DISTRIBUTED EQUALLY OVER THE WHOLE WIDTH OF THE CHAIN.**



Chain	Weight Of Conveyed Product	
	100Kg/m <sup>2</sup>	200Kg/m <sup>2</sup>
1535/6	250	200
2135/6	200	150
3030	200	150
4735/6	200	150
4839	300	250
5020	300	250
6392	300	250
7735	300	250



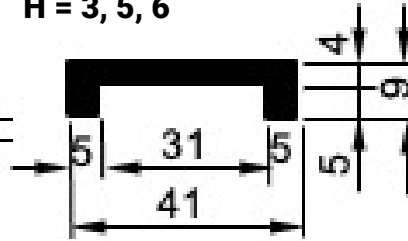
## TYPES OF WARE STRIPS (UHMWPE)

### NYLATRON:

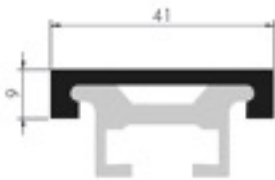
**PART: FLAT**  
**COLOUR: GREEN / BLACK**  
**H = 3, 5, 6**



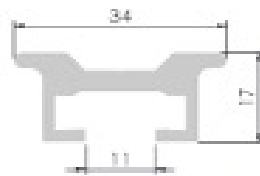
**PART: FLAT**  
**COLOUR: GREEN / BLACK**  
**H = 3, 5, 6**



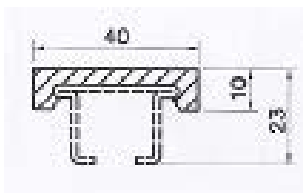
**PART: TBO-M00-01**  
**CLIP ON WARESTRIP**  
**COLOUR: BLACK**



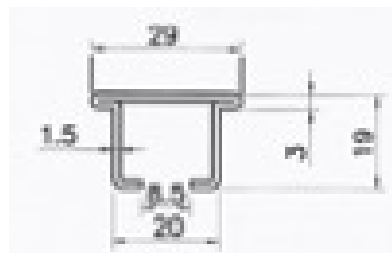
**PART: TB69-M00-00**  
**ALUMINIUM PROFILE.**  
**ONLY FOR RUNNING DRY**  
**COLOUR: BLACK**



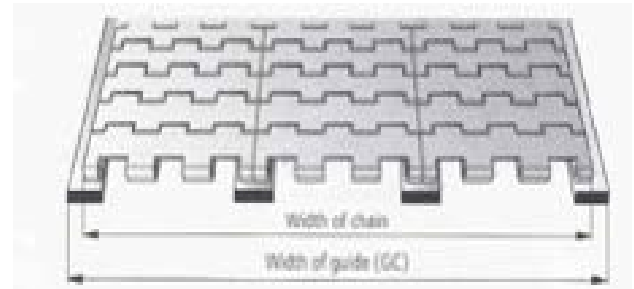
**PART: P4010V**  
**METAL PROFILE**  
**COLOUR: GREEN**



**PART: P4010V**  
**METAL PROFILE**  
**COLOUR: GREEN**



### WIDTH OF GUIDE (GC):



**OPERATION AT AMBIENT TEMPERATURE (20°C)**

Length Of Conveyor	A
Up to 10m	10mm
From 10m to 15m	15mm
Over 15m	20mm

**A = CLEARANCE BETWEEN GUIDE AND CHAIN.**

**OPERATION AT TEMPERATURE HIGHER THAN 20°C**

**AT HIGHER TEMPERATURES THE THERMAL EXPANSION OF THE CHAIN MUST BE TAKEN INTO ACCOUNT.**

**GC = WIDTH "EFFECTIVE" CHAIN + A + KK**

**KK = VARIATION OF CHAIN WIDTH DUE TO TEMPERATURE (mm)**

**K = EFFECTIVE WIDTH OF CHAIN (mm)**

**E = LINEAR COEFFICIENT OF EXPANSION**

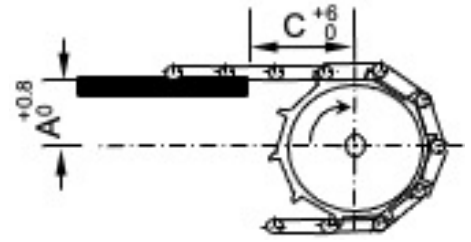
**T = OPERATING TEMPERATURE °C**



## POSITION OF GUIDE

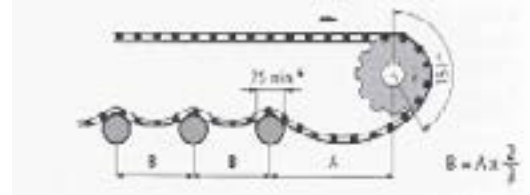
Chain	A mm	C mm (min)
1535 - 1536	$D_p/2 - 4.95$	15
2135 - 2136	$D_p/2 - 4.47$	25
2536	$D_p/2 - 5$	30
3030	$D_p/2 - 6.35$	50
4735 - 4736	$D_p/2 - 6.35$	38
4839	$D_p/2 - 7.90$	57
5020	$D_p - 7.50$	50
5035	$D_p/2 - 7.50$	35
6392	$D_p/2 - 7.00$	35
7735	$D_p/2 - 6.35$	25

**$D_p$  = PITCH DIAMETER IN mm**

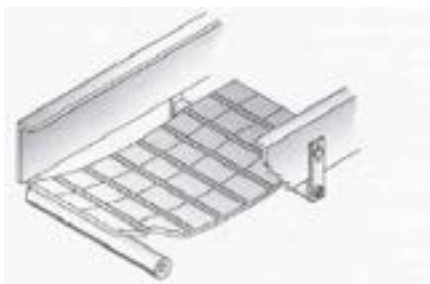


## CHAIN RETURN SUPPORT GUIDE SYSTEM

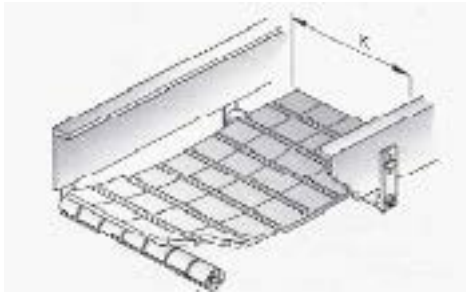
Chain	Minimum Radius mm
2135	25



**RETURN WITH ROLLERS MADE FROM PLASTIC, RUBBER OR METAL:**  
**FOR ELEVATED TEMPERATURES (PASTEURIZERS), METAL ROLLERS ARE RECOMMENDED. IN APPLICATIONS WITH CERTAIN PRODUCT LIKE SUGAR OR POWDER, SEALED ROLLERS SHOULD BE USED. FREQUENT CLEANING IS CRITICAL.**  
**IMPORTANT: THE ROLLERS MUST BE RIGID ENOUGH TO RESIST DEFLECTION OR SHOULD BE SUPPORTED IN THE MIDDLE.**



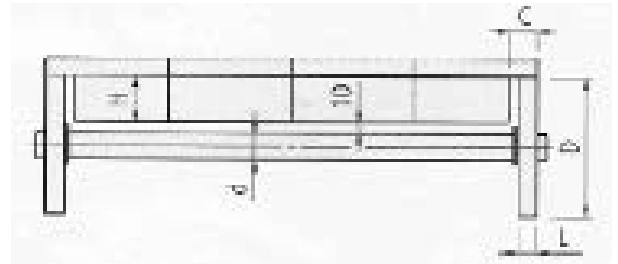
**RETURN ROLLERS PART 1001 OR 1388**



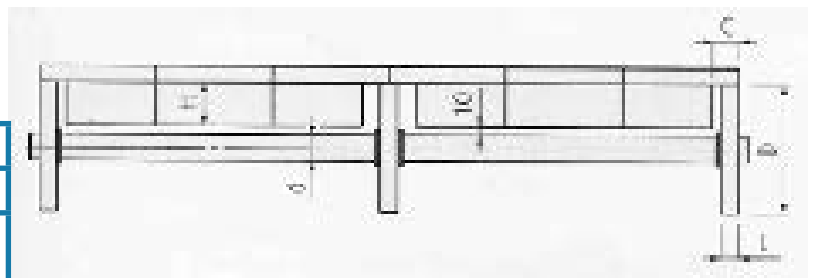
Part	OD mm	Df mm	Width
1001	60	16.5 / 20.5	40.5
1388	42.5	12.5 / 16.5 / 20.5	27.5

Width Of Chain	Df mm
Up to 675	12.5
675	16.5
770	16.5
1000	18.5
1200+	20.5

**RETURN WITH ROLLERS FOR CHAINS WITH A WIDTH OF UP TO 762 mm**



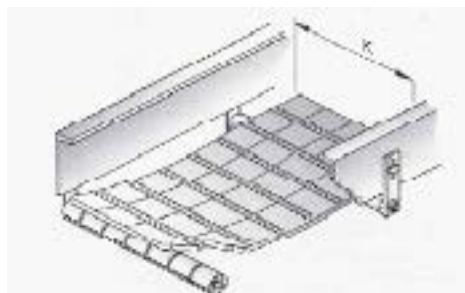
**RETURN WITH ROLLERS FOR CHAINS WITH A WIDTH OVER 762 mm**



- D = 2 (H + 10 + d/2)**
- L = C - 5mm**
- D = DIAMETER OF ROLLER**
- L = WIDTH OF ROLLER**
- d = SHAFT DIAMETER**
- H = HEIGHT OF PUSHER**
- 10 = CLEARANCE MINIMUM**

**SERPENTINE RETURN RECOMMENDED FOR ALL CHAINS WITH PITCH OF 38.1mm**

**SUPPORT SYSTEM FOR CHAIN WITH PUSHERS**

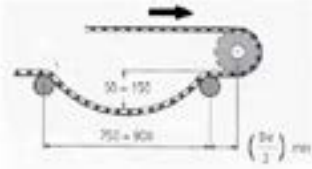


**MATERIAL RECOMMENDED FOR THE ROLLERS: POLYETHYLENE**

**THE END OF THE PUSHERS SHOULD NEVER HAVE CONTACT WITH THE FRAME OF THE CONVEYOR (IN.10mm CLEARANCE RECOMMENDED).**

## CATENARY

THE CATENARY IS THE LENGTH OF THE CHAIN IN THE RETURN SECTION, WHICH IS NOT SUPPORTED. THE WEIGHT OF THIS LENGTH OF CHAIN CAUSES A TENSION IN THE CHAIN. THIS TENSION IS NECESSARY TO ENSURE PROPER ENGAGEMENT BETWEEN CHAIN AND DRIVE SPROCKETS. THE CATENARY FURTHER ABSORBS DIFFERENCES IN THE LENGTH OF THE CHAIN CAUSED BY THE WORKING LOAD, SHOCK LOADS, AND THERMAL EXPANSION / CONTRACTION.



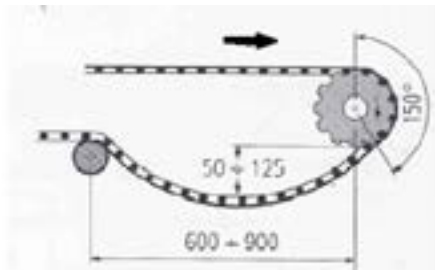
$$F_c = \frac{l^2 \times W}{799 \times f} + \frac{W \times f}{102}$$

$F_c$  = CATENARY FORCE-N/m  
 $l$  = SPAN - mm  
 $W$  = PRODUCT WEIGHT- Kg/m<sup>2</sup>  
 $f$  = SAG - mm

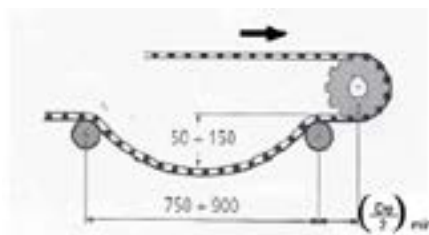
**CALCULATION OF SAG (f):**  $f = \text{SAG}$  - mm  
 $l = \text{SPAN}$  - mm  
 $L = \text{LENGTH OF CHAIN}$  - mm  
 $F = \sqrt{0.375 \times l \times (L - l)}$

## CATENARY FOR UNI-DIRECTIONAL CONVEYOR

CONVEYORS WITH A CENTRE DISTANCE OF UP TO 12 METERS, AND A PRODUCT WEIGHT OF MAX 75Kg/m<sup>2</sup>.

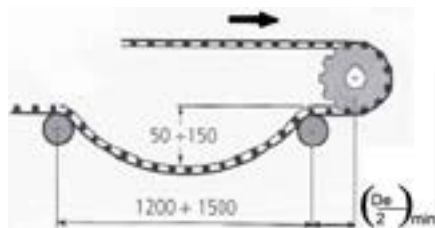


CONVEYORS WITH A CENTRE DISTANCE OF UP TO 20 METERS, AND A PRODUCT WEIGHT OF MAX 100Kg/m<sup>2</sup>.



$De$  = OUTSIDE DIAMETER OF DRIVE SPROCKET - mm

CONVEYORS WITH A CENTRE DISTANCE OF OVER 20 METERS, AND A PRODUCT WEIGHT OF OVER 100Kg/m<sup>2</sup>.

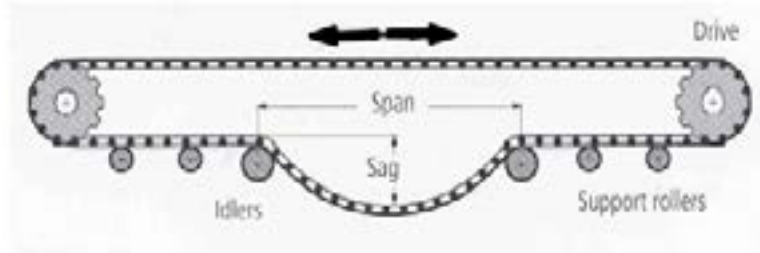


$De$  = OUTSIDE DIAMETER OF DRIVE SPROCKET - mm

## CATENARY FOR BI-DIRECTIONAL CONVEYOR

**DRIVE UNIT AT THE END**

**CONVEYORS WITH CENTRE DISTANCE BETWEEN 3 AND 6 METERS. LIGHT DUTY APPLICATIONS.**



### CALCULATIONS OF THE DIMENSIONS OF THE CATENARY:

#### 1. CALCULATIONS OF CHAIN PULL (F ADJUSTED)

$$F \text{ ADJUSTED} = F \times 2 \text{ (N / METER)}$$

$$F = \text{CHAIN PULL}$$

#### 2. CALCULATION OF SAG FORCE (Fc)

**TO DETERMINE THE SAG FORCE APPLY TABLE 6. AS THE SAG FORCE (Fc) IN TABLE 6, IS BASED ON CHAIN WEIGHT OF 1 Kg/m<sup>2</sup>), THE F ADJUSTED MUST BE DIVIDED BY THE WEIGHT OF THE CHAIN (Kg/m<sup>2</sup>). WITH THE HELP OF THIS VALUE THE REQUIRED CATENARY INFORMATION CAN BE OBTAINED FROM TABLE 6.**

**FOR EXAMPLE:**

$$\text{GIVEN } F \text{ ADJUSTED} = 1044 \text{ N/m}$$

$$\text{WEIGHT OF CHAIN} = 10.64 \text{ Kg/m}^2$$

**THE REQUIRED SAG FORCE Fc WILL BE:**

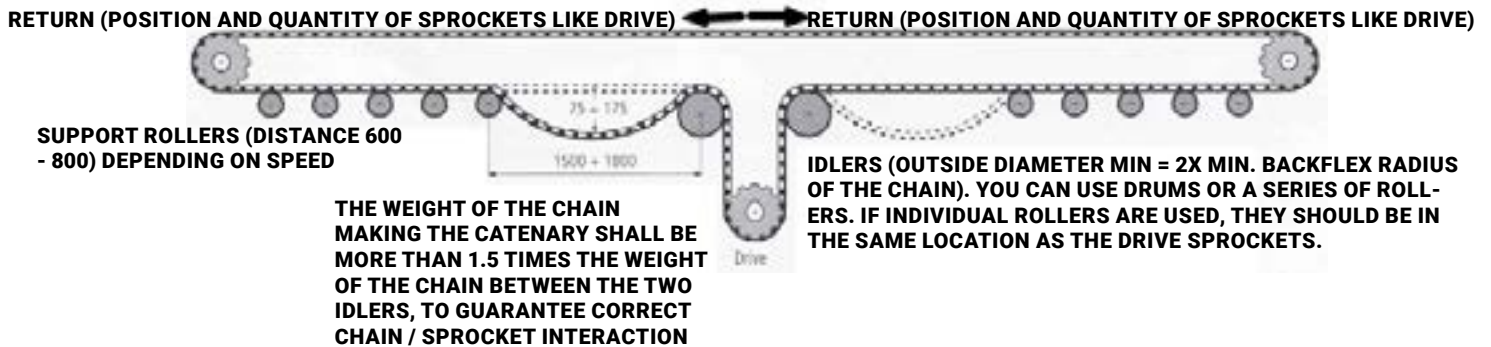
$$F_c = \frac{F \text{ ADJUSTED}}{\text{WEIGHT OF CHAIN}} = \frac{1044 \text{ N/m}}{10.46 \text{ Kg/m}^2}$$

**REFERRING TO TABLE 6, THE CLOSEST VALUE TO 99.8 IS Fc = 95.20N**

<b>TABLE 6</b>		Sag Force Fc (N) For Chain With A Weight of 1Kg/m <sup>2</sup>								
Span mm	250	1.77	1.77	1.77	2.06	2.06	2.35	2.65	2.65	3.34
	500	4.81	4.22	3.92	3.63	3.63	3.63	3.63	3.92	3.92
	750	10.20	10.20	6.90	6.30	5.70	5.40	5.40	5.40	5.40
	1000	17.40	13.40	11.40	9.90	9.00	8.30	7.70	7.50	7.20
	1250	26.70	20.40	16.80	14.30	12.90	11.70	10.80	10.20	9.60
	1500	38.30	29.00	23.60	20.40	17.70	16.20	14.70	13.70	12.30
	1750	52.00	29.20	31.70	27.00	23.60	21.00	19.10	17.70	15.90
	2000	67.70	50.80	41.30	34.70	30.20	27.00	24.50	22.50	19.70
	2250	85.30	64.10	51.80	43.80	37.80	33.60	30.20	27.90	23.90
	2500	105.00	79.10	63.80	53.60	46.40	41.00	36.80	33.80	29.00
	2750	127.00	95.20	76.60	64.40	55.70	49.10	44.30	40.10	34.40
	3000	151.00	113.00	91.20	76.30	65.80	58.10	52.00	47.40	40.40
		75.00	100	125	150	175	200	225	250	300
		Chain SAg (mm)								

## CONVEYORS WITH BOTTOM DRIVE:

### HEAVY DUTY APPLICATIONS



### 3. DIMENSIONS CATENARY

IN TABLE 6, THE VALUE OF  $F_c = 95.20$  N, CORRESPONDS WITH A SAG 100mm, AND A SPAN OF 2 750mm.

### 4. VERIFY IF SAG FORCE $F_c$ IS WITHIN 5% OF THE CHAIN PULL.

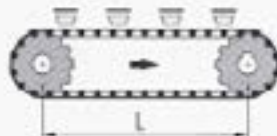
FOR A SATISFACTORY PERFORMANCE OF THE CONVEYOR, THE SAG FORCE  $F_c$  MUST BE EQUAL TO  $F$  ADJUSTED CHAIN PULL  $F_d$  (WITH A PERMISSABLE DEVIATION OF  $\pm 5\%$ )

$$F \text{ ADJUSTED TO } \pm 5\% = 1044 \pm 5\% = 992 / 1096$$

THE SAG FORCE  $F_c = 95,20 \times 10,46$  (WEIGHT OF CHAIN) = 996N, IS WITHIN THE 5% PERMISSABLE DEVIATION. IF THIS IS NOT THE CASE A BOTTOM DRIVE CONFIGURATION MUST BE CHOSEN.

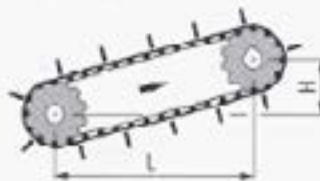
### CALCULATION OF CHAIN PULL:

#### ■ Horizontal conveyors



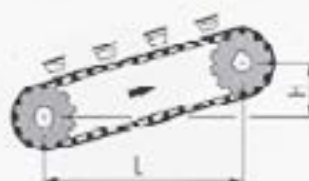
Without accumulation  $F = (2W + M) \cdot L \cdot F_w \cdot 9,81$   
 With accumulation  $F = [(2W + M) \cdot L \cdot F_w + (M \cdot L_s \cdot F_m)] \cdot 9,81$

#### ■ Inclined conveyors with flights



$$F = [(2W + M) \cdot L \cdot F_w + (M \cdot H)] \cdot 9,81$$

#### ■ Inclined conveyors without flights



Without accumulation  $F = [(2W + M) \cdot L \cdot F_w + (M \cdot H)] \cdot 9,81$   
 With accumulation  $F = [(2W + M) \cdot L \cdot F_w + (M \cdot L_s \cdot F_m) + (M \cdot H)] \cdot 9,81$

$F$  = CHAIN PULL (PER METER WIDTH OF CONVEYOR N/M)

$W$  = WEIGHT OF CHAIN PER SQUARE METER - Kg/m<sup>2</sup>

$M$  = WEIGHT OF CONVEYED PRODUCT PER SQUARE METER - Kg/m<sup>2</sup>

$L$  = HORIZONTAL CENTRE DISTANCE - M

$F_w$  = COEFFICIENT OF FRICTION BETWEEN CHAIN AND WARESTRIP

$L_s$  = LENGTH OF CONVEYOR, WHERE OCCUMULATION OCCURS

$F_m$  = COEFFICIENT OF FRICTION BETWEEN CHAIN AND CONVEYED PRODUCT

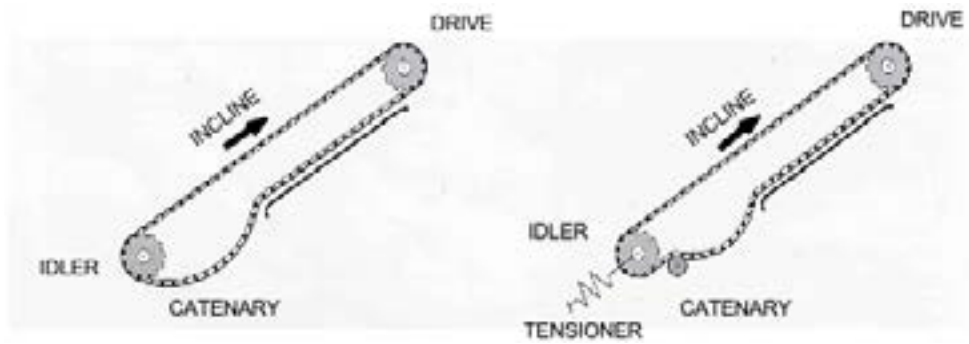
$H$  = VERTICAL CENTRE DISTANCE - M

$P$  = REQUIRED HORSEPOWER AT CONVEYOR DRIVE SHAFT - Kw

$K$  = WIDTH OF CHAIN - M

$V$  = CHAIN SPEED - M/MIN

## CATENARY FOR INCLINE CONVEYOR



## FRICTION FACTORS

### **COEFFICIENT OF FRICTION BETWEEN WEARSTRIP AND CHAIN**

Chain Material	Wearstrip Material							
	WHMWPE		HDPE		NYLATRON		STAINLESS	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
LF	0.18	0.20	0.20	0.22	0.18	0.20	0.20	0.25
POM	0.20	0.22	0.20	0.22	0.21	0.25	0.23	0.30
PP	0.25	0.30	0.25	0.30	0.25	0.30	0.25	0.35

### **COEFFICIENT OF FRICTION BETWEEN PRODUCT AND CHAIN**

Chain Material	Wearstrip Material									
	Plastic		Cardboard		Steel		Aluminium		Glass	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
LF	0.18	0.20	0.30	0.30	0.20	0.25	0.15	0.20	0.13	0.15
POM	0.20	0.22	0.30	0.30	0.20	0.25	0.15	0.20	0.13	0.15
PP	0.25	0.30	0.35	0.35	0.25	0.35	0.20	0.28	0.18	0.24

### COEFFICIENT OF FRICTION BETWEEN CHAIN AND WARESTRIP (Fw)

Chain Material	Lubrication	Wearstrip Material Stainless Steel (Fw)	Wearstrip Material UHMWPE Nylatron(Fw)
POM	Dry	0.30	0.25
	Water	0.23	0.21
	Water and Soap	0.15	0.15
	Oil	0.10	0.10
POM	Dry	0.25	0.20
	Water	0.20	0.18
	Water and Soap	0.15	0.15
	Oil	0.10	0.10
SP	Dry	0.22	0.18
	Water	0.20	0.16
	Water and Soap	0.25	0.14
	Oil	0.10	0.10
PE	Dry	0.28	0.23
	Water	0.22	0.20
	Water and Soap	0.15	0.15
	Oil	0.10	0.10
PP	Dry	0.35	0.30
	Water	0.25	0.25
	Water and Soap	0.20	0.20
	Oil	0.10	0.10

## MATERIAL CHARACTERISTICS

### ACETAL (WHITE)

**SUITABLE FOR HIGH LOADS. HIGH RIGIDITY AND SHOCK LOAD RESISTANCE. HIGH DIMENSIONAL STABILITY. GOOD RESISTANCE AGAINST HUMIDITY AND CHEMICALS.**

**OPERATING TEMPERATURES:**

**IN AIR: -40°C TO +80°C**

**IN HOT WATER: +65°C**

### PA POLYAMIDE (YELLOW)

**HIGH TOUGHNESS. OPTIMUM DIMENSIONAL STABILITY, ALSO AT RELATIVELY HIGH TEMPERATURES. GOOD CHEMICAL RESISTANCE.**

**OPERATING TEMPERATURES:**

**IN AIR: 0°C TO +80°C**

**IN HOT WATER: +65°C**

### PE POLYETHYLENE (BLACK / WHITE)

**HIGH CHEMICAL RESISTANCE. LOW COEFFICIENT OF FRICTION. IMPROVED WEAR RESISTANCE. NO ABSORPTION OF HUMIDITY.**

**OPERATING TEMPERATURES:**

**IN AIR: -40°C TO +80°C**

**IN HOT WATER: +70°C**



**HEAT STABILIZED, REINFORCED POLYAMIDE (BLACK)**  
**SPECIALLY FORMULATED TO RESIST THERMAL DEGRADATION FROM BOILING WATER**  
**SPRAY (i.e. RINSERS, STERILIZERS, PASTEURIZERS)**  
**OPERATING TEMPERATURES:**  
**IN HOT WATER: +105°C**

## **CLEANING**

### **GENERAL INFORMATION:**

**WITHOUT THE CONTINUAL CLEANING ACTION OF SOAP AND WATER LUBRICATION, DIRT, AND SPILLED PRODUCT, SUCH AS SYRUP, BEER, SODA etc. MAY BUILD UP ON THE CHAIN AND IN THE CONVEYOR TRACKS. THIS CAN RESULT IN INCREASED WEAR OF THE CHAIN, WEARSTRIPS AND SPROCKETS. THIS CAN ALSO CAUSE INCREASED INCREASED CONTAINER BACKLINE PRESSURE, AND EVEN DAMAGE CONTAINERS. THEREFORE, A THOROUGH AND REGULAR CLEANING PROCEDURE IS VERY IMPORTANT TO THE SUCCESSFUL OPERATION OF ANY DRY RUNNING CONVEYOR LINE.**

**NOTE: IF CONVEYORS ARE GOING TO SIT IDLE FOR A LONG TIME BEFORE START-UP, THEY SHOULD BE COVERED WITH PLASTIC OR DROP CLOTH TO MINIMIZE DIRT AND DEBRIS THAT CAN SETTLE INTO THE CHAIN AND TRACKS.**

**NOTE: BEFORE START-UP, REMOVE ANY TOOLS, FASTNERS, OR OTHER ITEMS THAT MAY HAVE BEEN LEFT BEHIND. THOROUGHLY CLEAN CHAIN, WEARSTRIPS AND TRACKS (CARRY AND RETURN) WITH AIR HOSE OR HIGH PRESSURE WATER SPRAY.**

### **RECOMMENDED CLEANING FREQUENCY:**

#### **COMPLETELY DRY LINES:**

**THESE LINES SHOULD BE CLEANED DAILY TO OBTAIN MAXIMUM SANITATION AND PERFORMANCE. AT THE VERY MINIMUM, RINSE DAILY AND THOROUGHLY, SANITIZE WEEKLY.**

#### **PARTIALLY LUBRICATED LINES:**

**THOROUGHLY SANITIZE WEEKLY.**

### **GENERAL GUIDELINES FOR CLEANING SOLUTIONS:**

- 1. RECOMMENDED ph OF 4.5 - 9**
- 2. AVOID CHLORINE (BLEACH), AMMONIA AND IODINE.**
- 3. WITH PLASTIC CHAIN, AVOID PHOSPHORIC ACID (FOUND IN MANY STAINLESS STEEL CLEANERS).**
- 4. REFER TO PAGE CHEMICAL RESISTANCE TABLE TO DETERMINE COMPATIBILITY OF CLEANERS USED ON CHAIN AND OTHER CONVEYOR COMPONENTS.**



## **METHOD OF CLEANING:**

**1. PERIODIC HIGH PRESSURE HOT WATER RINSE OR STEAM CLEANING SHOULD PROVE SATISFACTORY. SPRAY THE CHAIN IN PLACE ON EACH CONVEYOR, BOTH ON THE CARRY AND IN THE RETURN SECTIONS. THIS IS USUALLY DONE WITH THE CONVEYORS RUNNING, BUT THE CHAIN CAN BE STATIONARY. FOR EASE ACCESS TO THE UNDERSIDES OF THE CHAINS IN THE CARRY AND RETURN WAYS, SOME MANUFACTURERS PROVIDE 'CLEAN-OUT' HOLES IN THE SIDE FRAMES.**

**2. WARM WATER AND MILD SOAP ARE COMMONLY USED TO CLEAN THE CONVEYORS.**

**3. FOAMING AGENTS OR OTHER CHEMICAL CLEANERS MAY BE USED IF THEY ARE COMPATIBLE WITH CONVEYOR MATERIALS. (SEE CHEMICAL RESISTANCE TABLE). CAREFULLY FOLLOW THE INSTRUCTIONS PROVIDED BY THE MANUFACTURER TO DETERMINE PROPER CONCENTRATION OF SOLUTIONS AND PROPER SAFE USE AND DISPOSAL.**

**NOTE: KEEP WATER, STEAM AND CHEMICALS AWAY FROM ELECTRICAL COMPONENTS.**

**4. IN SOME CASES e.g. PET BOTTLE LINES, CLEANERS OR COMBINATION 'CLEANER / LUBRICANTS' ARE APPLIED CONTINUOUSLY OR INTERMITTENTLY.**

**5. IN EXTREME SITUATIONS, IT MAY BE NECESSARY TO PERIODICALLY CLEAN THE CHAINS WITH A BRUSH. CLEAN THE CHAIN IN PLACE ON THE CONVEYOR, BOTH ON THE CARRY AND IN THE RETURN SECTIONS.**

**NOTE: THE MAIN OBJECTIVE IS TO CLEAN THE CHAIN CARRYING SURFACE AND UNDERSIDE AS WELL AS THE WEARSTRIPS AND TACKS.**

**NOTE: INSPECT CONVEYORS OFTEN. REMOVE BROKEN OR JAMMED CONTAINERS AS SOON AS THEY ARE DETECTED. USE CLEANING SOLUTIONS TO CLEAN AWAY EXCESSIVE SPILLAGE**

# Chemical Resistance

	Wearstrip Material					Chain Material		
	Steel	Stainless Steel Austenitic AISI 304 (18/8)	Stainless Steel Ferritic Aisi 430	Polyamide Nylatron	Polyethylene UHMWPE	Acetal D-LF HP-WHP	Polypropylene HT-WHT	Polyehtelene WLT
Chemical Agent	% 23°C	% 23°C	% 23°C	% 23°C	% 23°C	% 23°C	% 23°C	% 23°C
Acetone	-	50 +	50 +	100 +	+	/	+	+
Acetic Acid	50 +	20 +	20 -	10 -	10 +	5 -	40 +	10 +
Ammonia	/	50 +	50 +	10 +	+	+	30 +	+
Aniline		3 +	3 +		3 +	3 +		3 +
Beer	+	+	+	+	+	+	+	+
Benzene	+	70 /	70 /		/	+	+	/
Benzoil	+	+	+	100 +	/	+	/	/
Boric Acid		100 /	100 /	10 -	+		+	+
Brine	-		-	/	+	/		+
Butter		+	+	+	+	+	+	+
Butyric Acid	+	5 +	5 +	-	+	-		+
Calcium Chloride		10 -	10 -	10 +	+		50 +	+
Carbon Sulfide		+	/	100 +		+	+	
Carbon Tetrachloride	/	10 -	10 -	+	/	+	-	/
Caustic Soda	-	+	+	10 +	25 +	25 -	52 +	25 +
Chlorinated Water	-	-	-		-	-	-	-
Chlorine	-	-	-	-	-	-	+	+
Chloroform		100 +	100 /	100 -	-	-	/	-
Citric Acid	-	5 +	5 +	10 /	+	/	10 +	+
Cyclohexane					-	+	-	-
Cupric Sulphate		5 +	5 +	10 +				
Diethyl Ether				100 +			+	
Distilled Water				+	+	+	+	+
Ethanol		10 +	10 /	96 +		+	96 +	
Ethyl Chloride		+	+	100 +	/		-	/
Food Fats		+	+	+	+			+
Food Oil		+	+	+	+	+	+	+
Formaldehyde	+	100 +	100 +	30 +	/	+	40 +	/
Formic Acid	-	5 /	5 -	10 -	10 +	10 +		10 +
Fresh Water	-	+	+	+	+	+	+	+
Fruit Juices	+		/	+	+	+	+	+
Gasoline	+	+	+	+	/	+	/	/
Glycerol		+	/	+	+	+	+	+
Hexane		+	+		-	+	+	+
Hydrochloric Acid	2 -	-	-	10 -	37 -	37 +	30 +	37 +
Hydrofluoric Acid		-	-	40 -	70 +		40 +	70 +

	Wearstrip Material					Chain Material		
	Steel	Stainless Steel Austenitic AISI 304 (18/8)	Stainless Steel Ferritic Aisi 430	Polyamide Nylatron	Polyethylene UHMWPE	Acetal D-LF HP-WHP	Polypropylene HT-WHT	Polyehtelene WLT
Hydrogen Peroxide	-	30 +	30 +	3 -	+	-	30 +	+
Iodine	-	-	-	-	/	-	/	/
Lactic Acid	-	5 +	5 /	10 +	+	+	20 +	+
Methyl Alcohol		100 /	100 /	100 +		+	+	
Methylene Chloride		/		100 +	/	-	/	/
Mercury		100 /	100 /	+	+			+
Milk	+	+	+	+	+	+	+	+
Mineral Oils	+	+	+	+	+	+	+	+
Nitric Acid	-	10 +	10 /	10 -	5 /	5 -	+	5 /
Non Alcoholic Drinks	+	+	+	+	+	+	+	+
Oleic Acid		100 /	100 /	100 +	/		+	/
Paraffin	+	+	+	+	+	+		+
Petroleum	+	+	+	+	-	+		-
Petroleum Ether		+		+		+	+	
Phosphoric Acid	10 -	10 -	10 -	10 -	95 +	10 -	85 +	95 +
Sea Water	-	+	-	+	+	/	+	+
Soap and Water	/	+	+	+	+	+	+	+
Sodium Carbonate		5 +	5 +	10 +	+	+	+	+
Sodium Chloride	-	5 +	5 /	10 +	+	+	+	+
Sodium Hydroxide	25 -	25 +	25 +	25 -	25 +	25 -	25 +	25 +
Sodium Hypochlorite	-	-	-	+	+	-	+	+
Sodium Sulphate		5 +	5 +	+				
Sulphuric Acid	40 -	10 -	10 -	-	40 /	40 -	98 +	40 /
Tartaric Acid		10 +	10 +	+	+	30 /	10 +	+
Tincture of Iodine				-	+		10 +	+
Toluene (Toluol)	+	+	+	+	-	/	+	-
Trichloro-Ethylene		+	+		-	-		-
Turpentine		+	+		-	-		-
Vaseline				+	/			/
Vegetable Juices	/	+	+	+	+	+	+	+
Vegetable Oils	+	+	+	+	+	+	+	+
Vinegar	-	+	+	+	+	+	+	+
Whisky	+	+	/	+			+	
Wine	+	+	+	+	+	+	+	+
Xylene	+	+	+	+	/	+	-	/

# Conversion Factors

Length	Into	Multiply By
Inches (in)	Millimeters (mm)	25.4
Inches (in)	Meters (m)	0.0254
Feet (ft)	Millimeters (mm)	304.8
Feet (ft)	Meters (m)	0.3408

Weight	Into	Multiply By
Pounds (lbs)	Kilograms (Kg)	0.4536
Pounds / Foot (lbs/ft <sup>2</sup> )	Kilograms / m <sup>2</sup>	4.8824
Kilograms (Kg)	Pounds (lbs)	2.2046
Kilograms / m <sup>2</sup> (Kg/m <sup>2</sup> )	Pounds / Foot <sup>2</sup> (lbs/ft <sup>2</sup> )	0.2048

Force		
Newton (N)	Kilograms - Force (Kgf)	0.102
Pounds / Force (lbs)	Newton (N)	4.448
Pounds / Foot (lbs/ft)	Newton / Meter (N/m)	14.59
Kilograms - Force (Kgf)	Newton (N)	9.807
Newton (N)	Pounds - Force (lbs)	0.225
Newton / Meter (N/m)	Pounds / Foot (lbs/ft)	0.0685

Force		
Newton (N)	Kilograms - Force (Kgf)	0.102
Pounds / Force (lbs)	Newton (N)	4.448
Pounds / Foot (lbs/ft)	Newton / Meter (N/m)	14.59
Kilograms - Force (Kgf)	Newton (N)	9.807
Newton (N)	Pounds - Force (lbs)	0.225
Newton / Meter (N/m)	Pounds / Foot (lbs/ft)	0.0685

Power		
Horse power (CV)	Kilowatt (kW)	0.735
Horse Power (HP)	Kilowatt (kW)	0.745
Kilowatt (kW)	Horse Power (CV)	1.36
Kilowatt (kW)	Horse Power (HP)	1.341

Speed		
Feet/Minute (ft/min)	Meters/Minute (m/min)	0.3408
Meters/Minute (m/min)	Feet/Minute (ft/min)	3.2808

Temperature		
Farenheit (°F)	Centrgrade (°C)	°C=5/9 x (°F-32)
Centrgrade (°C)	Farenheit (°F)	°F=9/5 x (°C+32)