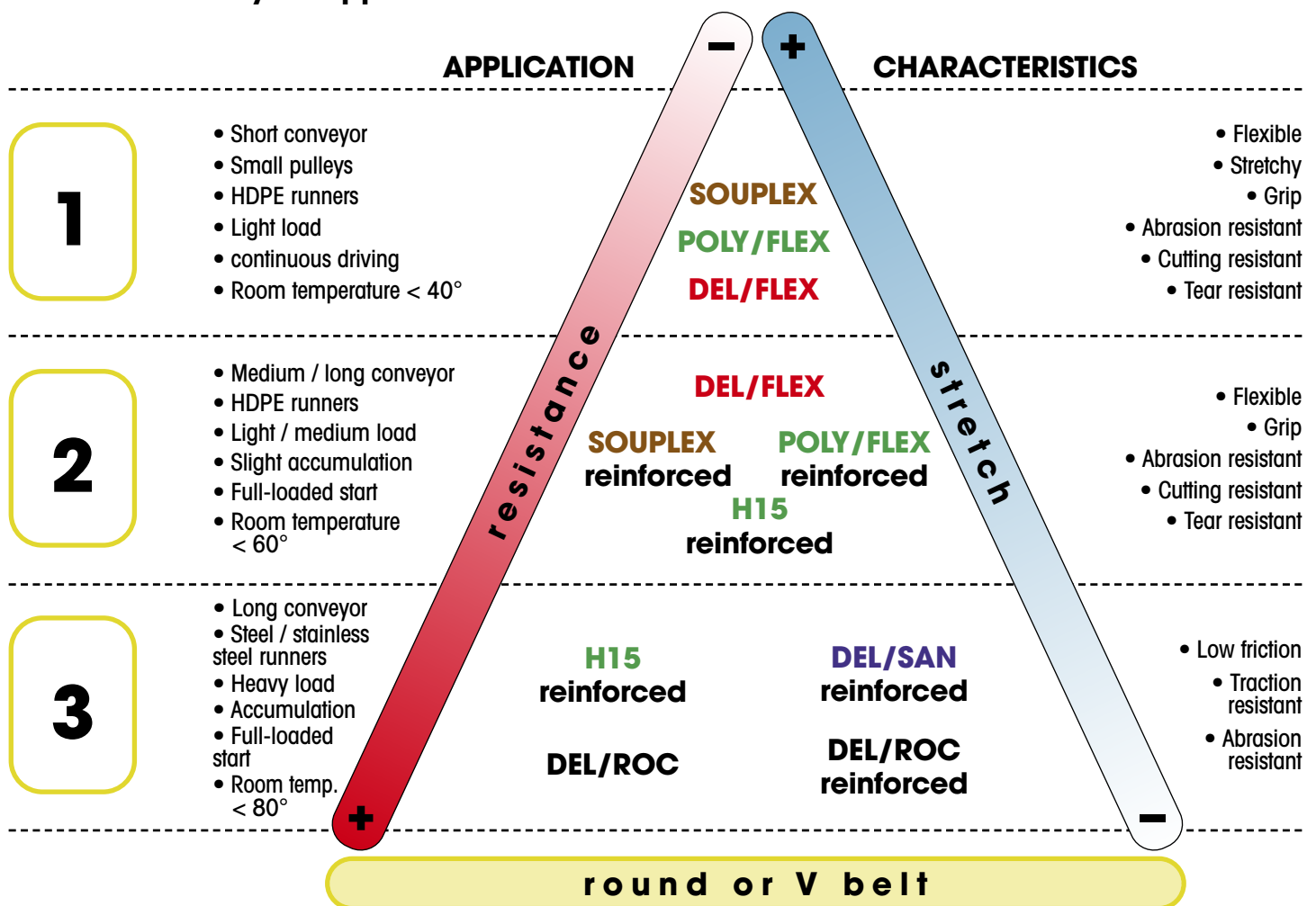


To choose the right belt, you need to know the characteristics of the conveyor on which it will run, its working conditions and the product it will convey.

CONVEYOR	PRODUCT TRANSPORTED	WORKING CONDITIONS
length of the conveyor	maximum transported weight	continuous or stop-and-go driving
diameter of the pulleys	nature of the product	accumulation
type of support	spreading of the weight along the conveyor	other efforts, pressure, etc.
length of the tensioning system	temperature of the product	room temperature
number of belts		
inclination		

Choose up, amongst the 3 following categories, which one best matches to your application :



Into the selected category, choose the quality of belt whose general characteristics, such as **resistance, hardness, friction coefficient, stretch, operating temperature...** are the closest to the ones your are looking for.

Examples :

- In case of accumulation of the products transported on the belt, choose the quality with the lowest friction coefficient.
- To convey heavy loads, choose the strongest and less stretchy quality.

NB: The stretch of low-hardness belts (85 and 90 shA), such as SOUPLEX, POLY/FLEX and DEL/FLEX, allows you to mount them with pretension (shortened of a length that corresponds to the elongation that the belt would need to work properly), and in some cases to avoid the using of a tensioning system.

The mounting of the hardest belts (95 and 100 shA) and/or reinforced belts requires the using of a tensioning system or tensioning tools (page 34).



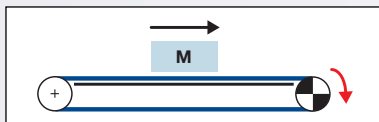
conveying / simplified calculations

SYMBOLE	MEASURES	DESIGNATION	BELT CHARACTERISTIC (in catalogue)
M	Kg	Transported load	
Mmax	Kg	Maximum load limit per belt	
Mtotal	Kg	Maximum load limit on all the belts	
Mr	Kg	Weight of all the tangentially driven rollers	
L	m	Conveyor length	
H	m	Conveyor height	
F	daN	Minimum traction force for the continuous driving of the load M	
F'	daN	Minimum traction force for full-loaded starts with the load M	
Ft	daN	Traction force of the chosen belt	X
t	%	Stretch corresponding to the traction force of the belt Ft	X
Cfp		Friction coefficient on the transported product on the belt	
Cf		Friction coefficient of the belt on its runner	X
Cr		Rolling coefficient of the belt on its support (0.05 to 0.1 according to the conditions: smooth support, bearings,...)	
Cs		Safety coefficient	

type of conveyor

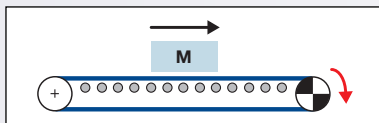
simplified calculation of the needed traction force to drive a specific load

simplified calculation of the maximum load limit per belt



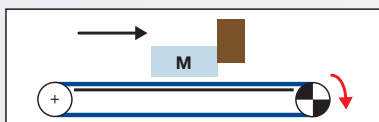
$$F = M \times C_f$$

$$M_{max} = F_t / C_f$$



$$F = M \times C_r$$

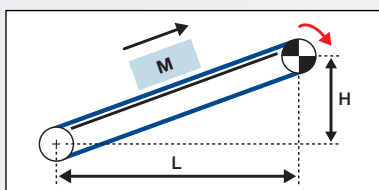
$$M_{max} = F_t / C_r$$



In case of accumulation, take into account the friction coefficient of the product to convey on the belt. You will add this data to the friction coefficient of the belt on its runner :

$$F = M \times (C_f + C_{fp})$$

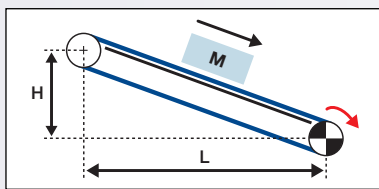
$$M_{max} = F_t / (C_f + C_{fp})$$



If your conveyor is inclined, consider the difference in height :

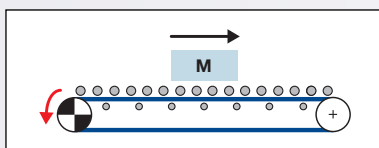
$$F = M \times C_f + M \times (H / L)$$

$$M_{max} = F_t / (C_f + H / L)$$



$$F = M \times C_f - M \times (H / L)$$

$$M_{max} = F_t / (C_f - H / L)$$



Always take into account the weight of all the tangentially driven rollers in your calculations.

$$F = (M + M_r) \times C_r$$

$$M_{max} = (F_t / C_r) - M_r$$

For all type of conveyors,
in case of
STOP-AND-GO DRIVING
(full-loaded starts) :

The traction force **F** determined above must be multiplied by 2.

$$F' = F \times 2$$

As you calculate **Mmax**, only take into account half the traction force of the selected belt.

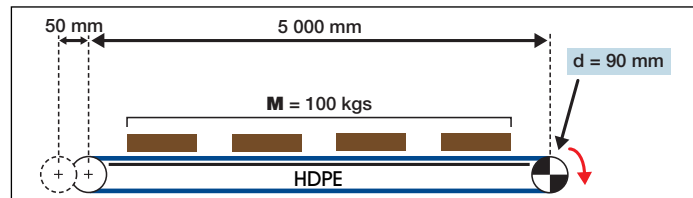
Replace **Ft** by **Ft/2**

1/ EXISTING MACHINE

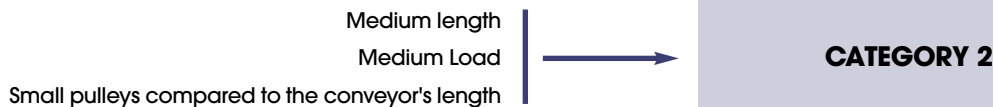
CONSIDER THE CHARACTERISTICS OF THE CONVEYOR, OF THE TRANSPORTED PRODUCT, AS WELL AS THE GENERAL WORKING CONDITIONS.

CHOOSING THE MOST ADEQUATE BELT.

Continuous conveying of wood boards on two parallel 17 x 11 mm V belts sliding on HDPE runners.



Choosing the belt category (page 41)



Choosing the quality of the belt



Checking the pulley diameter out

d = 90 mm

We strongly recommend to respect the recommended pulley diameter. Too small pulleys would damage the belt and reduce its life time.

	SOUPLEX reinforced & cogged 17 x 11 mm	H16 reinforced & cogged 17 x 11 mm
Ø recommended (mm)	110	130
Ø mini (mm)	90	110



Calculating the maximum load limit

Total load on the conveyor (kgs)

M = 100 kgs

Traction force of the selected belt
Corresponding elongation
Friction coefficient on HDPE
Maximum load limit per belt
Maximum load limit on 2 belts
Safety factor

	SOUPLEX reinforced & cogged 17 x 11 mm	H16 reinforced & cogged 17 x 11 mm
Ft (daN)	40	50
ε (%)	1	1.5
Cf	0.35	0.25
Mmax (Kgs) = Ft / Cf	114	200
Mtotal (Kgs) = 2 x Mmax	228	400
Cs = Mtotal / M	2.3	4



SOLUTIONS

Both selected belts could easily convey this load of 100 kgs. Nevertheless, the H16 17 x 11 mm V belt requires much bigger pulleys than the 90 mm of the described conveyor. On the other hand, the reinforced and cogged 17 x 11 mm SOUPLEX can bend around pulleys down to 85 mm diameter. The most appropriate belt for this application is our **reinforced and cogged 17x11mm SOUPLEX, mounted with 1% pretension.**

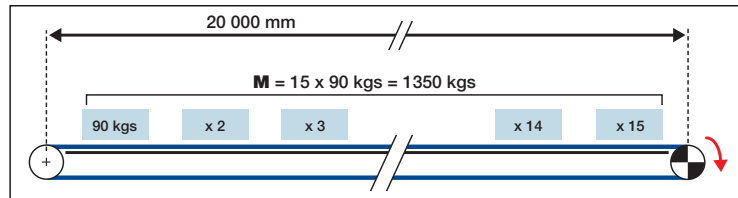


2/ PROTOTYPE

CHOOSING THE RIGHT BELT ACCORDING TO CONVEYOR DESIGNER'S SPECIFICATIONS.

DESIGNING A CONVEYOR IN ACCORDANCE WITH THE CHARACTERISTICS OF A PARTICULAR BELT.

Conveyor for an industrial cheese-dairy conveying 15 round cheeses of 90 kgs each along 20m. Stop-and-go driving.



choosing the belt category (page 41)

Long conveyor
Heavy load
Full-loaded starts

CATEGORY 3

choosing the quality of the belt

High traction force
Low friction coefficient
Easy to clean

**reinforced belt
DEL/ROC or DEL/SAN
round belt**

calculating the traction force to drive this load

Total load on the conveyor (kgs)

M = 1350 kgs

Friction coefficient of the belt **Cf**
Continuous traction force **F (daN) = M x CF**
Traction force for full-loaded start **F' (daN) = F x 2**

	reinforced & round DEL/ROC			reinforced & round DEL/SAN		
	on runner stain.steel	HDPE	on support pulleys	on runner stain.steel	HDPE	on support pulleys
Cf	0.5	0.15	0.1	0.55	0.2	0.1
F (daN) = M x CF	675	203	135	743	270	135
F' (daN) = F x 2	1350	405	270	1486	540	270

choosing the section and the number of belt(s)

Choosing, among the selected category, how many belts and of which section are necessary to reach the necessary traction force, taking into account safety factor of about 1.5.

	reinforced & round DEL/ROC ø 18 mm			reinforced & round DEL/SAN ø 18 mm		
	Traction force : Ft = 200 daN			Traction force : Ft = 125 daN		
traction force for full-loaded starts F' (daN)	1350	405	270	1486	540	270
Necessary number of belts Nbre = F' / Ft	7	3	2	12	5	3
Total traction force Ftotal (daN) = Nbre x Ft	1400	600	400	1500	625	375
Safety coefficient Cs = Ftotal / F'	1.04	1.5	1.5	1.01	1.16	1.4

SOLUTIONS

Several options are possible

3 reinforced DEL/ROC round belts d.18mm on HDPE runner
2 reinforced DEL/ROC round belts d.18mm on support pulleys
3 reinforced DEL/SAN round belts d.18mm on support pulleys

Consider the recommended pulley diameters

Reinforced DEL/ROC D.18 mm	Reinforced DEL/SAN D.18 mm
ø 360 mm	ø 250 mm



The traction forces of the belts selected through our example (200 daN for reinforced DEL/ROC diam. 18 mm and 125 daN for reinforced DEL/FLEX diam. 18 mm) are indicated in our catalogue at the following respective elongations: 2% and 1,5%. We strongly recommend to consider these tensions while mounting the belts on the machine, for the conveyor to work properly.