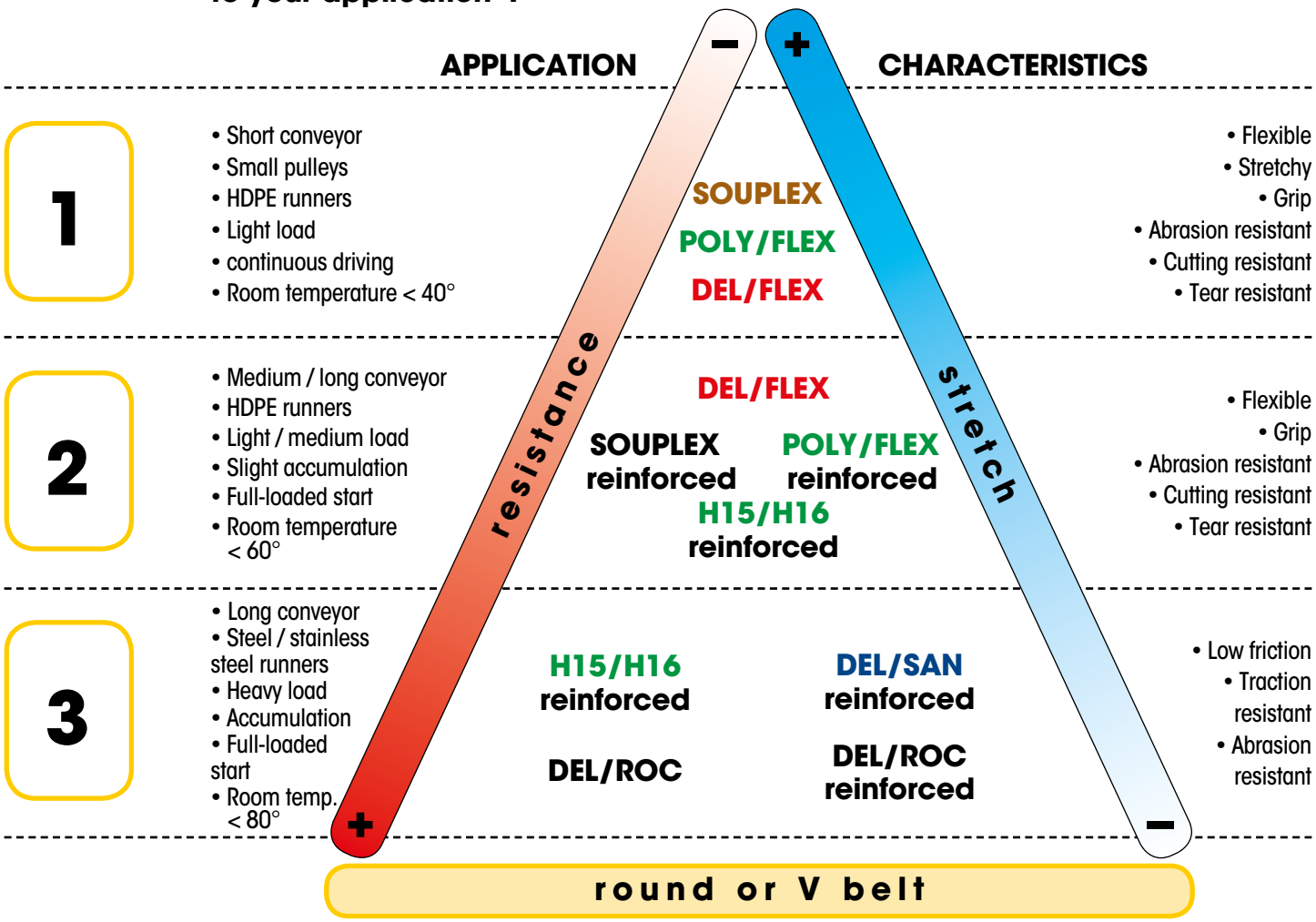
To choose the right belt, you need to know the characteristics of the conveyor on which it will run, its working conditions and the product it will convey.

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 :



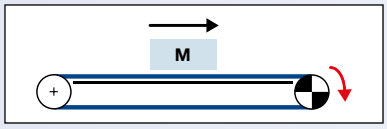
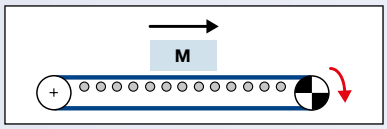
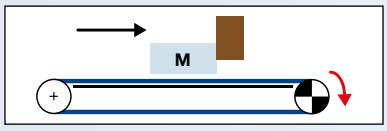
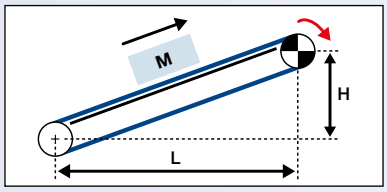
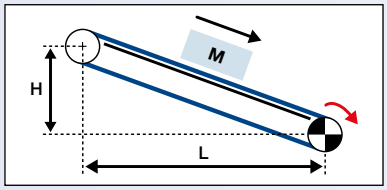
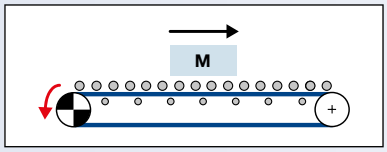
Into the selected category, choose the quality of belt whose general caracteristics, such as : **resistance, hardness, friction coefficient, stretch, operating temperature...** are the closest to the ones your are looking for.

Exemples :

- 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 36).

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	

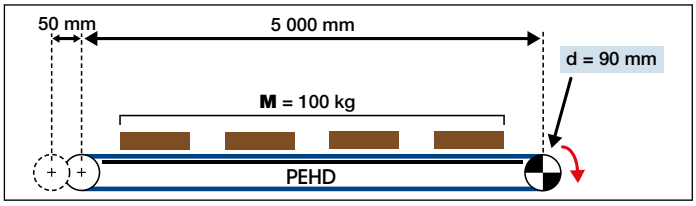
type of conveyor	simplified calculation of the needed traction force to drive a specific load	simplified calculation of the maximum load limit per belt
 CONVEYOR WITH RUNNERS	**F = M x Cf**	**Mmax = Ft / Cf**
 CONVEYOR WITH SUPPORT PULLEYS	**F = M x Cr**	**Mmax = Ft / Cr**
 CONVEYOR WITH ACCUMLULATION	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 x (Cf + Cfp)**	**Mmax = Ft / (Cf + Cfp)**
 UPWARD CONVEYOR	If your conveyor is inclined, consider the difference in height : **F = M x Cf + M x (H / L)**	**Mmax = Ft / (Cf + H / L)**
 DOWNWARD CONVEYOR	**F = M x Cf - M x (H / L)**	**Mmax = Ft / (Cf - H / L)**
 CONVEYOR WITH TANGENTIALLY - DRIVEN ROLLERS	Always take into account the weight of all the tangentially driven rollers in your calculations. **F = (M + Mr) x Cr**	**Mmax = (Ft / Cr) - Mr**
For all type of conveyors, in case of **STOP-AND-GO DRIVING** (full-loaded starts) :	The traction force **F** determined above must be multiplicated by 2. **F' = F x 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 GENERALWORKING 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)

Medium length
Medium Load
Short tensioning system : 50 mm maxi

→ **CATEGORY 2**

Choosing the quality of the belt

Long belt > 10 metres →
Small pulleys →
Short tensioning system : 50 mm maxi →

reinforced belt
cogged belt
SOUPLEX reinforced or H16

Calculating the maximum load limit

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**

	SOUPLEX reinforced & cogged 17 x 11 mm	H16 reinforced & cogged 17 x 11 mm
Traction force of the selected belt **Ft** (daN)	40	50
Corresponding elongation **t** (%)	1	1.5
Friction coefficient on HDPE **Cf**	0.35	0.25
Maximum load limit per belt **Mmax** (Kg) = **Ft / Cf**	114	200
Maximum load limit on 2 belts **Mtotal** (Kg) = **2 x Mmax**	**228**	**400**
Safety factor **Cs = Mtotal / M**	**2.3**	**4**

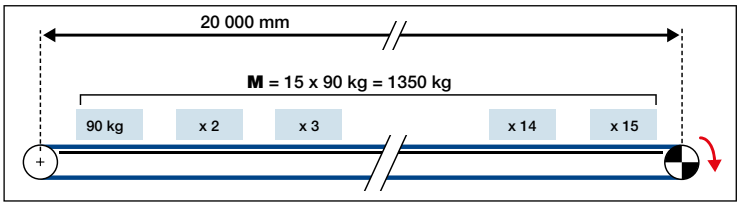
SOLUTIONS

Both selected belts could easily convey this load of 100 kg.Nevertheless, the H16 17 x 11 mmV 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 apropriate 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 ACCORDANCEWITH THE CHARACTERISTICS OF A PARTICULAR BELT.

Conveyor for an industrial cheese-dairy conveying 15 round cheeses of 90 kg 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 (kg) on the conveyor **M = 1350 kg**

		reinforced & round DEL/ROC			reinforced & round DEL/SAN		
		on runner stain.steel	HDPE	on support pulleys	on runner stain.steel	HDPE	on support pulleys
Friction coefficient of the belt	**Cf**	0.5	0.15	0.1	0.55	0.2	0.1
Continuous traction force	**F (daN) = M x CF**	675	203	135	743	270	135
Traction force for full-loaded start	**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 Traction force : Ft = 200 daN			reinforced & round DEL/SAN ø 18 mm 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. 18mmand 125 daN for reinforced DEL/FLEX diam. 18mm) are indicated in our catalogue at the following respective elongations: 2% and 1.5%.
We strongly recommend to consider these tensions whilemounting the belts on themachine, for the conveyor to work properly.