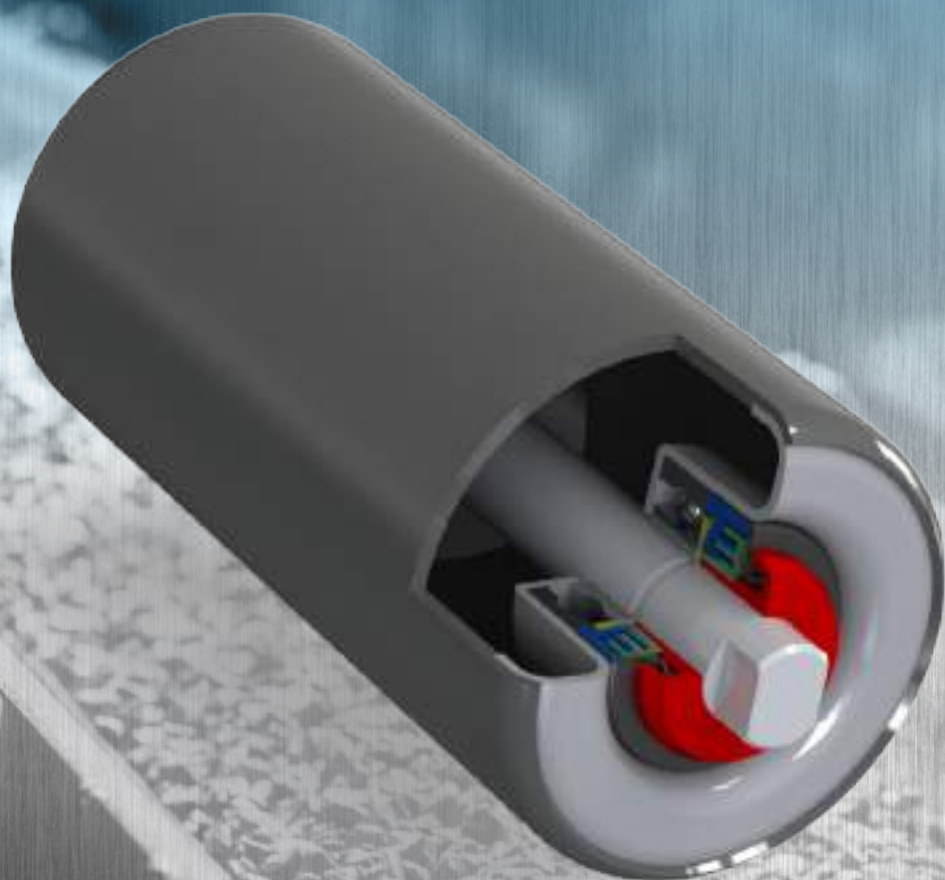


Leach

ROULEAUX



BULK ROLLER
BULK PRODUCT HANDLING

VERSION · 2



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In 50 years, we have hauled ourselves to be among the leaders of handling rollers, for bulk as well as isolated loads.

Our sustained and regular growth has allowed us to produce a million rollers per year in a competitive manner whatever the quantity demanded, from a single unit to several thousand pieces.

Our voluminous and diverse stock as well as our reactivity allows us to have short delay times, in general 2 to 3 weeks for products made from standard components.

Our personnel and our highly specialised machines allow us to obtain a quality recognized on all continents. Between 25 and 30% of our production is directly exported.

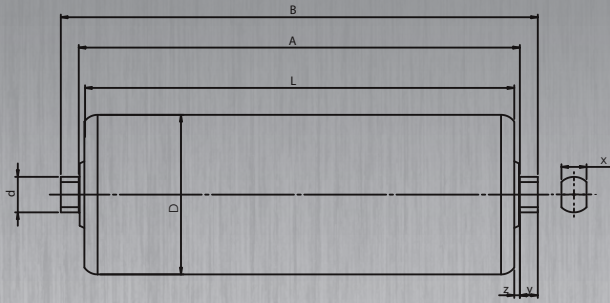
Our components and our tools entirely rethought over previous years allow us to cover all of the ranges for bulk rollers, tubes up to a 220 diameter and axes up to a 65 diameter. These rollers are equipped with our highly reputed M+ joints and can reach up to more than 3 metres in length. All standards are produced: French, European, American, Russian or Chinese.

Our Design Office has also become a leader in support development in response to specific demands in terms of shape, resistance and security.

Our highly experienced sales department is able to guide you in your choice in order to give you maximum satisfaction.



French Standard PNE 53300 and European NFE 53301



Belt width	Standard PNE 53300			Standard NFE 53301		
	Trough(L/A/B)	V-shaped (L/A/B)	A flat (L/A/B)	Trough(L/A/B)	V-shaped (L/A/B)	A flat (L/A/B)
300		190/196/216	375/408/440		200/208/ 232(*226)	400/408/ 432(*426)
350	125/131/151	215/221/241	425/458/490			
400	150/156/176	240/246/266	475/508/540	160 /168/ 192(*186)	250/258/ 282(*276)	500/508/ 532(*526)
500	190/196/216	290/296/316	575/608/640	200/208/ 232(*226)	315/323/ 347(*341)	600/608/ 632(*626)
600	230/236/256	340/346/366	675/708/740			
650	240/246/266	360/366/386	725/758/790	250/258/ 282(*276)	380/388/ 412(*406)	750/758/782
700	255/261/281	390/396/416	775/808/840			
800	290/296/316	430/436/456	875/908/940	315/323/ 347(*341)	465/473/ 497(*491)	950/958/982
900	325/331/351	500/506/526	1015/1048/1080			
1000	360/366/386	575/581/601	1115/1148/1180	380/388/ 412(*406)	600/608/ 632(*626)	1150/1158/1182
1200	430/436/456	675/681/701	1315/1348/1380	465/473/ 497(*491)	700/708/732 (670/678/702)	1400/1408/1432
1400	500/506/526	775/781/801	1515/1548/1580	530/538/ 562(*556)	800/808/832 (750/758/782)	1600/1608/1632
1600	570/576/596	875/881/901	1715/1748/1780	600/608/ 632(*626)	900/908/932	1800/1808/1832
1800	640/646/666	975/981/1001	1915/1948/1980	670/678/702	1000/1008/1032	2000/2008/2032
2000				750/758/782	1100/1108/1132 (1150/1158/1182)	2200/2208/2232
2200				830/838/862	1200/1208/1232	2400/2408/2432
2400				900/908/932	1300/1308/1332	2600/2608/2632

Standard PNE 53300 remark : For rollers of a 133 diameter or more, the L side is shortened by 5 mm, the sides A and B being unchanged. This is advantageous to avoid interferences between the rollers in supports in deep troughs.

* : For rollers < 600 mm and an axis of 20 mm, the overall side length of axis B is shortened by 6 mm and the flats have a 9 mm length.

Standard NFE 53301 : For rollers of a 133 diameter or more, the L side can, on demand, be shortened by 5 mm, the sides A and B being unchanged. This is advantageous to avoid interferences between the rollers in supports in deep troughs. The usage of the V-shape can be used: for belts from 300 to 800 in superior parts. For belts of 1000 and more in inferior parts.

Flat dimensions

SUPERIOR ROLLERS

Axis diameter	Standard PNE 53300			Standard NFE 53301		
	X	Y	Z	X	Y	Z
15	10 (8 Possible)	10	3	10 (8 Possible)	9	4
20	14	10	3	14	9	4
25	14 (18 Possible)	10	3	18	12	4
30	22	10	3	22	12	4
40	32	10	3	32	12	4

INFERIOR ROLLERS

Axis diameter	Standard PNE 53300			Standard NFE 53301		
	X	Y	Z	X	Y	Z
15	10 (8 Possible)	16	16,5	10 (8 Possible)	12	4
20	14	16	16,5	14	12	4
25	14 (18 Possible)	16	16,5	18	12	4
30	22	16	16,5	22	12	4
40	32	16	16,5	32	12	4

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Roller

Roller definition

The rollers that we have described in this catalogue are those used for the transportation of bulk products by conveyor belts. Depending on how they are used, we have named them in the following way:

► Carrying rollers

Rollers that support the part of the belt that transports the material. These rollers can give the belt a trough-shape, either in « V » or flat.



► Impact rollers

Rollers that support the belt at the transporters loading points. These rollers generally give the belt a trough-shape.



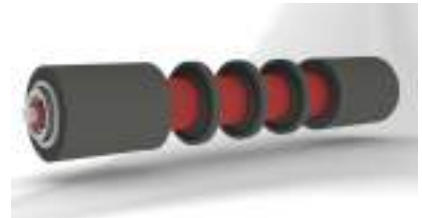
► Return rollers or inferior rollers

These are rollers that maintain the return strand of the load carrying belt. In general, the side used for this is in contact with the rollers. The return can be made with a flat or "V" shaped belt to provide a better centering.



► Anti-clogging rollers

These rollers are covered with rings or sheaths of rubber where the aim is to prevent sticking or clogging of transported products.



► Bending rollers

Rollers that impose an inclined change on the belt.



► Control rollers

Rollers situated close to the drums with the aim of raising the contact surface between the latter and the belt.

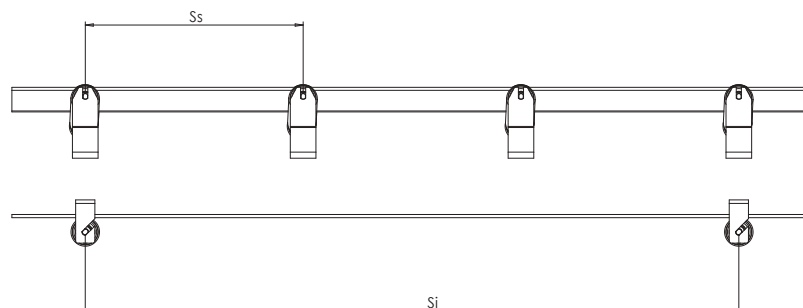


Roller

Roller dimensions

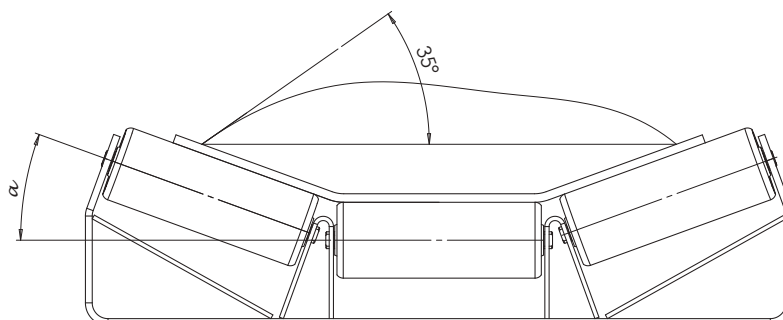
Database

Roller dimension calculations



Transporter characteristics

Lb : belt width	Ss : Distance between two carrying stations in meters
Db : Transporter rate in tons/hour	Sc : Distance between two charging stations in meters
Vb : Belt speed in meters/second	Si : Distance between two return stations in meters
Mb : Linear mass of the belt in kilograms/meter	α : Trough angle in degrees



Roller characteristics

Dt : Tube diameter in mm	B : Outside length of shaft in mm
Da : Shaft diameter in mm	X : Distance between the support
L : Tube casing length in mm	y : Distance between the rolling and shaft extremity
A : Length between irons in mm	z : Distance between the roller rim and rolling

Belt characteristics

Belt width	Thickness (mm)	Mass (Kg/m)
400	8	4
500	8	5
650	8	7
800	9	9
1000	10	12
1200	11	15
1400	12	20
1600	13	25
1800	14	30
2000	15	40

In the case where the belt is not determined, the following table can be used to give an approximation of its linear mass (valid for textile belts).

Roller

Roller dimensions

► Calculating the actual load per station : Ces in Newton

Load carrying belt $Ces = 10 Ss (Mb + Db/3.6 Vb)$

Return load carrying belt $Ces = 10 Si * Mb$

Load (calculated according to CEMA standard 502-2004)

Case of homogeneous material

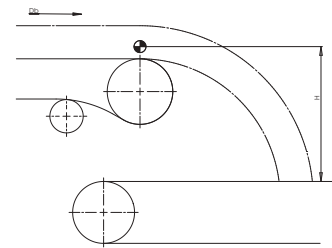
Force globale d'impact : Fg

$Fg = 1.12Db \sqrt{H}$ in Newton

With H : Chute height in meters

Impact force per station

Space between two stations	Impact force per station
Inferior to 0.3	$Ces = 10 Sc * Mb + 0.5 Fg$
Between 0.3 and 0.45	$Ces = 10 Sc * Mb + 0.7 Fg$
Between 0.45 and 0.6	$Ces = 10 Sc * Mb + 0.9 Fg$
Superior to 0.6	$Ces = 10 Sc * Mb + Fg$



Case of materials with blocks (superior to 50 mm in length)

The Ces effort is used to calculate the rolling lifetime, but it is desirable to increase the rolling dimension size to keep count of the shocks generated by the falling objects (see table below)

Impact force per station :

$Fi = 10Mbl + 3.8 * \sqrt{kMbl * H}$ in Newton

With H falling height in meters

Mbl block mass in Kg

k roller impact factor

For an impact roller take $k = 0.5$

For a stainless steel roller take $k = 1$

$Ces = 10 Sc * Mb + Fi$

This calculation does not take into account eventual chute blocking, nor eventual efforts to distribute the heaps.

Shaft diameter choice of impact rollers by means of granulometry

Block dimension (mm)	Factor $Mbl * H$ (Kg m)	Minimum shaft diameter (mm)
100	6	20
150	25	25
200	40	30
300	75	35
500	150	40

Roller

Roller dimensions

► Calculating the actual load on rollers: Cer in Newton

We consider that in a trough, the horizontal roller is the most requested. Therefore, if Mr is the roller mass in kilograms, by first approximation, the turning part represents 70% of the total mass of this one.

3 roller trough.....Cer = 7 Mr + F1 Ces

«V» shaped trough.....Cer = 7 Mr + 0.6 Ces

«V» return.....Cer = 7 Mr + 0.5 Ces

Flat return.....Cer = 7 Mr + Ces

α in degree	F1
20	0.6
25	0.62
30	0.65
35	0.67
40	0.7
45	0.72

► Weighting of the load by roller by granulometric means

This calculation only concerns carrying rollers.

The Fgr factor is equal to 1 for all powdered materials. It rises progressively by means of the block mass transported, this mass being estimated by means of the block size and density.

See table below (taken from the CEMA standard).

Maximum grain size in millimeters	Material density						
	1	1.5	2	2.5	3	3.5	4
100	1.0	1.0	1.0	1.0	1.1	1.1	1.1
150	1.0	1.0	1.0	1.1	1.1	1.1	1.1
200	1.0	1.0	1.1	1.1	1.2	1.2	1.2
250	1.0	1.1	1.1	1.1	1.2	1.2	1.2
300	1.0	1.1	1.1	1.2	1.2	1.2	1.3
350	1.1	1.1	1.1	1.2	1.2	1.3	1.3
400	1.1	1.1	1.2	1.2	1.3	1.3	1.3
450	1.1	1.1	1.2	1.2	1.3	1.3	1.4

Load weighted by roller

$Cpr = Fgr * Cer$ in Newton

Load weighted by rolling

$Cprl = x1 * Cpr$ in Newton

Offset coefficient of the load x1	
Trough	0,75
In «V»	0,9
Flat	0,6

Remark : the axial efforts on the roller bearings are not taken into account because they are theoretically very weak. However, certain dysfunctions caused by unfortunate constructive measures (for example the distances between stations being too large, poor belt choice, pinching being too strong) or an approximate maintenance can render these efforts very disadvantageous.

► Calculating the roller speed in revolutions/minute

$$\Omega = 60000 Vb / Dt\pi$$

Rotation speed limit :

The design of conveyor rollers is made for everyday use. The authorized maximum speed for a standard roller is 600 revolutions/minute. Some design and manufacturing measures are taken in case this limit is passed. Please consult us.

Roller

Roller dimensions

► Calculating shaft bending components

Four bending components are taken into account

• Bending caused by the load

$$x = (A+B)/2$$

$$y = (x-L)/2+z$$

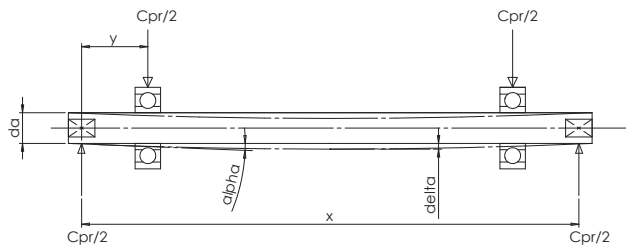
$$\alpha_1 = \frac{Cpr \cdot y}{4 \cdot EI} \cdot (x-2y) \text{ in radian}$$

$$\delta_1 = \frac{Cpr \cdot y}{48 \cdot EI} \cdot (3x^2 - 4y^2) \text{ in mm}$$

With E : Elasticity module 210000 N/mm²

I : Shaft inertia $I = \frac{\pi d^4}{64}$

x, y, d in mm



Rolling	Width	z	d	i
6202	11	13	15	2485
6204	14	15	20	7850
6205	15	28	25	19170
6206	16	30	30	39740
6305	17	30	25	19170
6306	19	32	30	30740
6307	21	33	35	73620
6308	23	34	40	125600
6310	27	51	50	306700
6312	31	55	60	635900

Remark : The z valuation is the constructor's data. The data values in this table are only valid for Rouleaux Pack. We are still looking to minimize this valuation, because it is very disadvantageous in roller dimensions, in that our tips are among the most compact on the market, and we can offer these products an optimal lifetime.

• Bending caused by shaft weight

$$\alpha_2 = \frac{5\rho g \pi d^2 x^3}{384EI} \text{ in radian}$$

$$\delta_2 = \frac{5\rho g \pi d^2 x^4}{1536EI} \text{ in mm}$$

With ρ : stainless steel density $7.8 \cdot 10^{-6}$ Kg/mm²

g : 9.81 m/s²

• Roller construction defaults

Although we take the greatest care in our manufacturing, misalignment between the rolling boxes can occur. These misalignments are even more disadvantageous when the roller is short. When the roller length is inferior to 1.2 times its diameter, we manufacture a turning tube piece which improves the precision to the detriment of passed time carried out. The formula that we give is therefore valid for the longer lengths.

$\alpha_3 = 0.5/L$ in radian - With L : tube casing length in mm

Roller

Roller dimensions

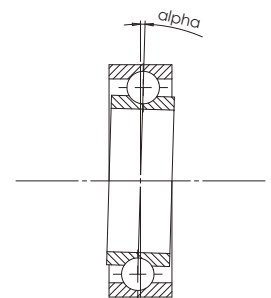
- Rolling play on shaft

The functioning play between the rollings and the shaft allow a light misalignment between the interior rings and the latter without raising the internal forces, we can therefore remove the equivalent of this displacement from the sum of the first 3 angles

$$\alpha_4 = 0.001 \text{ in radian}$$

- Total bending

$$\begin{aligned} \text{Misalignment angle} \quad \alpha_t &= \alpha_1 + \alpha_2 + \alpha_3 - \alpha_4 \text{ in radian} \\ \text{Central shaft} \quad \delta_t &= \delta_1 + \delta_2 \text{ in mm} \end{aligned}$$



Dynamic misalignment

The lack of balance or off-centering of the tube causes an shaft excitation of the roller which may be close to its own mode and can begin to resonate. In this case, the banging, in one of its extreme positions, gives rise to static misalignment causing shocks on the ball bearings. It is therefore important, especially for long shafts, to check for the absence of this phenomenon. A conservative estimation of its own mode is given by the formula :

$$fr = 17.8 \sqrt{\delta_t} \text{ with } fr : \text{Resonance frequency in hertz}$$

$$\delta_t : \text{Static shaft in mm}$$

Normal use of conveyor rollers makes their functioning difficult beyond resonance. For normal speeds we advise applying the following recommendations :

Speed $\Omega/60$ in revolutions/second	Recommendation
Inferior to 0.5 fr	$\alpha_t = \alpha_i$
Between 0.5 and 0.7 fr	$\alpha_t = 1,2 \alpha_i$
Between 0.7 and 0.8 fr	$\alpha_t = 1,5 \alpha_i$
Superior to 0.8 fr	Shaft diameter rise

Roller

Roller dimensions

► Lifetime reduction coefficient caused by misalignment

The angle incline of the right rolling shaft causes a cutting of the ball bearings caught between the exterior and interior belts. They are deformed by « barreling » and end up blocking the rolling.

In order to make the misalignment as least damaging as possible, we use the rollers with widened spaces (from class C3 to C5). Furthermore, our joints, amongst the most compact on the market, allow the minimization of transport dimension z, disadvantageous in this calculation.

α_T Degree	α_T Radian	Coefficient k_4
0.05	0.001	1
0.1	0.002	0.98
0.15	0.003	0.95
0.2	0.004	0.90
0.25	0.005	0.80
0.3	0.006	0.60
0.35	0.007	0

► Calculation of the roller lifetime

If C is the dynamic charge capacity in Newton

The C values are given in the Roller chapter paragraph 14

$L_{10h} = (C / C_{pr})^n * 10^6 / 60 \Omega$ (in working hours)

The exponent is equal to 3 for the 6000 series rollers

equal to 10/ 3 for the 21000 and 22000 series rollers

► Reliability coefficient

The calculation below gives a lifetime probability of 90%. It can be used in certain cases to have a larger reliability, and in this case we use the coefficient (K5) which corrects the previous result in order to take into account this demand.

Reliability in %	L_{xy}	K5
90	L_{10h}	1
95	L_{5h}	0.64
96	L_{4h}	0.55
97	L_{3h}	0.47
98	L_{2h}	0.37

Roller

Roller dimensions

► Lifetime of weighted rollers

$L_{\text{applied}} = L_{10h} * K4 * K5$

- For the quarry type installations working on 1 or 2 stations and the non-strategic conveyors, we advise : $L_{\text{applied}} > 20000$ hours.
- For the industrial installations of major importance or in mines or of installations of continuing work, we advise : $L_{\text{applied}} > 40000$ hours.
- For the strategic conveyors or very long or dangerous, we advise :
 $L_{\text{applied}} > 60000$ hours.

In all cases, an economical compromise must be found between frequent changes of cheaper rollers and the less frequent changing of expensive rollers, knowing that today, sometimes in return for an adaptation of products used, an average lifetime of between 3 and 5 years can perhaps be obtained.

► Influence of atmospheric factors

The standards in force for calculating the lifetime of weighted rollers of those in working maintenance conditions, aggressivity or of temperature. These coefficients which are used impose an over-sizing of the axis and the rollers. The question that should be asked is the following : Will the increase in the axis diameter resolve the problem?

Will the roller resist better to a maintenance default, a corrosive atmosphere or to a raised temperature ? Only an efficient collaboration between users, installation constructors and manufacturers of rollers can allow the discovery of efficient solutions and better optimize the budgets established for rollers.

Contact us when :

- The transported products are dangerous chemicals.
- The temperature passes 80° or -20°C .
- The installations are on the coast or subject to strong corrosion.
- The daytime temperature variations are superior to 40°C .
- The installations work with large stopping periods.

Sealing system

The usage of rollers touches all the areas of conveying bulk products because the belt conveyor is often the most rational choice and the most economical in terms of power. Sealing, while remaining very economical and with weak resistance to rolling, must offer an efficient protection in the most diverse conditions.

The criteria to take into account are

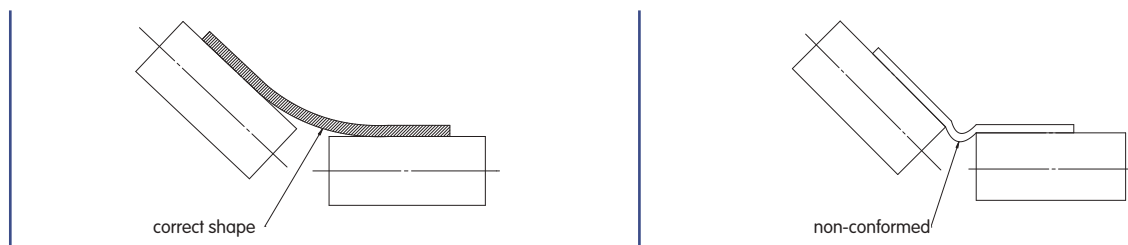
- The chemical nature of the transported product
- The granulometry of the product
- The temperature and its variations
- The working weight and speed
- The exposure to corrosion
- The maintenance and cleaning of the installations
- The cleanliness of the belt, in particular for the return strand
- The working spectrum

Our sealing system M+ was developed to respond to the majority of everyday work. Coupled with an appropriate choice of grease, it offers a mechanism which is amongst the most efficient on the market. Do not hesitate to contact us for all delicate applications so that we can study the best solution together. A sealing system default is the major cause of roller failure. Thanks to a few adequate mechanisms, we can improve the high reliability of your installations.

Tube wear

The belt is moved on the rollers essentially by a rolling method, but relative gliding is never completely excluded. This, in time, can cause tube wear, especially if the material transported is very abrasive.

In certain installations, an inappropriate belt choice or a distance between stations which is too high or with a poor tension can generate a belt deformation between the stations in a pocket shape. When it goes back to its theoric position in contact with the rollers, it generates transversal gliding, causing high pressure on the trough angles. A quick wear on the roller edges can produce a force which leads to the separation of the tube from the case. The latter can also seriously damage the belt.



In the cases where innovator parameters have not been corrected, we can propose solutions to avoid or delay these annoyances

- Use of HEL tubes (High elastic limit)
- Higher tube thickness
- Adapted surfaces

Roller

Conception

Axis wear

The impact on rollers can lead to premature wearing if the internal ring turns around the axis. The main causes of this default are:

- Too large a play on the impact of rollers
- The stainless steel on the axis is not hard enough
- The rollers are not weighted enough in relation to the roller choice
- Use of grease not fluid enough (a frequent problem at low temperatures).

To delay this phenomenon, we systematically use starting from a 25 diameter for h7 manufactured impacts in « semi-hard » steel. We strongly advise however not to assemble these rollers with an axis tightening because the dilation and the bending of these can cause high axial efforts in the rollers and quick damage.

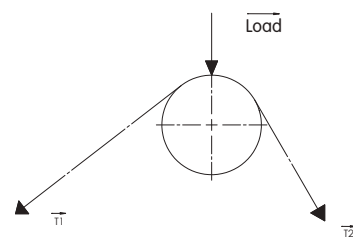
Proportion of bending rollers and of force

The previous method applied to the proportion of bending rollers and of force but the belt stress was added to others.

The belt stress can be calculated in the context of standard ISO 5048 . In this case, a security coefficient of 1.5 must be applied for the bending rollers and for 2 of the force rollers. By a first approximation we can also roughly determine the stress starting from the motor strength :

$T = \text{strength} / \text{belt speed}$. In this case we can take into account the security coefficient.

Stress result on the roller is the geometric stress sum and not the algebra sum.



In most of these cases, the bending of the axis causes a misalignment too high for the rollers. It is preferable in this case to use ball-and-socket joint rollers in double rows like the 21000 or 22000 series rollers.

In the most restricting cases it must be anticipated to use solid cases in order to avoid lamination of the exterior impact roller. It is sometimes preferable to choose a solution with applied bearings assembled on the flanges. This solution can have advantages for avoiding the complete dismantling of the roller in cases of rolling intervention.

The different solutions are explained in page 44.

Advice for work in an ATEX environment (gas or dust)

The ATEX standard makes the distinction between the installations from top to bottom and the protection level class in 3 categories : very high, high, normal (see table below)

Type/Level of protection	Very high	High	Normal
Bottom	M1	M2	
Top	1	2	3

The bottom installations (M1 and M2) necessitates that the products have a prototype that was certified CE by an authorized organization. Rouleaux Pack has not carried out this approach. The top installations must be classed by zones.

In zone 1, we must use level 1 material

In zone 21, we must use level 2 material

In zone 22, we must use level 3 material

The conveyor roller is a mechanical non-motorized component. In this way, the level 1 material is seen to have the same demands as the M1 and M2 materials. The level 2 material necessitates a certification by an authorized organization (this approach is not carried out by Rouleaux Pack). The level 3 material necessitates an auto certification.

We are given responsibility by the legislator to make decisions where we do not have entire knowledge, and we prefer to refer to the experience of collieries. These have specified all demands in the ATEX standard concerning working rollers in the explosive atmosphere zones. This work is the object of standard NFM 81-657 in France and standard DIN 22112 in Germany. Moreover, the collieries in France have edited a file (file S3 June 1989) concerning the rings for shock-absorber rollers and surfaces for carrying rollers for use in bottom installations. These standards, used for more than 50 years in coalmining, are in our opinion the most relevant today for working in an ATEX environment. We have therefore decided to apply these texts in level 3.

Furthermore, the use of rollers in an ATEX environment must give rise to certain constructive measures :

► Evacuation of static electricity

A mine roller is conceived for the conductivity to be assured between the tube and the axis. The conduction must also be assured by crossing the support and the chassis until ground level. This imposes that the rollers and the supports do not have an insulating surface protection (it is better to galvanize than to paint).

Roller

Conception

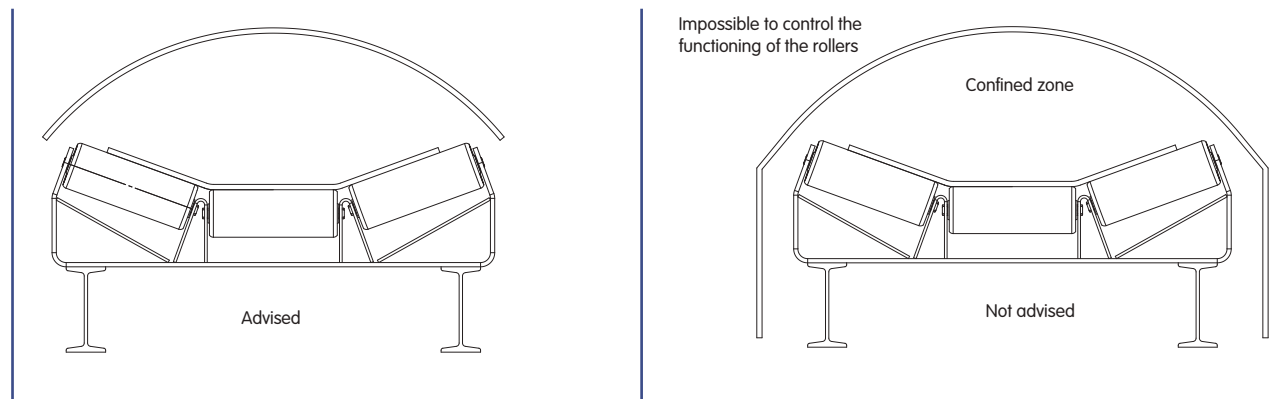
► Risk of contact sparks

The shock or the rubbing on steel can generate sparks. In this case it could be necessary to conceive roller turning parts in 316 type steel or to anticipate an anti-static rubber surface. This risk is linked to the transporter speed. It is normal to take into account that the speeds are superior to 1 meter/second.

The retractable angle protections or other close means of protection could hamper the flow of ejected materials from the belt, here increasing the danger, and we recommend carrying out the protection of zones or covers in an ATEX environment.

► Measures concerning covers

The ventilation is a primordial security element in explosive atmospheres. The covers confining the conveyors can present a risk in cases where forced ventilation is not established. In this measure, it is possible to leave natural ventilation by creating a free space between the covers and the framework of the conveyor.



► Roller visualization

Rollers are wear and tear objects. They can, for one reason or another, become blocked. The rubbing generated by the sliding of rubber on steel causes over-heating which is capable, in the worst scenarios, of setting fire to the belt. It is indispensable in the installations at risk (and even on the others) to make frequent visual inspections and to carry out regular maintenance in order to control the absence of dysfunction. The covers should not be an obstruction for these operations.

► Inspection of roller rotation

In certain installations, it can be difficult to see if a roller is in rotation. The use of infra-red (thermal imaging cameras or infra-red glasses) allows this inspection to be carried out.

Axis ends

There exists several ways to maintain the rollers on their supports. Rouleaux Pack, thanks to their methods of production, can carry out all standard forms or specific axis.

The axis shapes most used are :

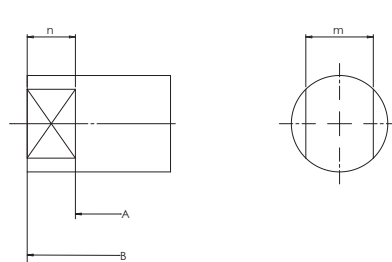
- Double M-shaped flats mxn
- Double W-shaped interior flats mxnxt
- Axis to assemble on an A-shaped chain nxn/gxh
- Roller guide shape Gu fxh
- Simple S-shaped flats nxm
- T-shaped tapping txh
- F-shaped threading fxh
- E-shape retaining wall and threading fxh
- Threading between P-shaped flats nxm/txh
- Other possible X-shape executions

► Double M-shaped flats mxn

This shape is the most used in bulk conveyors because it is accepted in different European standards. The normal dimensions are :

- Standard ISO 1537 and NFE 53 301

Diam axis	Carrier mxn	Return mxn
20	14x9	14x12 (*)
25	18x12	18x12
30	22x12	22x12
40	32x12	32x12



(*) Rouleaux Pack can propose standard flats of a 12 length for the return rollers of a 20 diameter for reducing the fall risk.

The standard anticipates the possibility of tips on standard axis

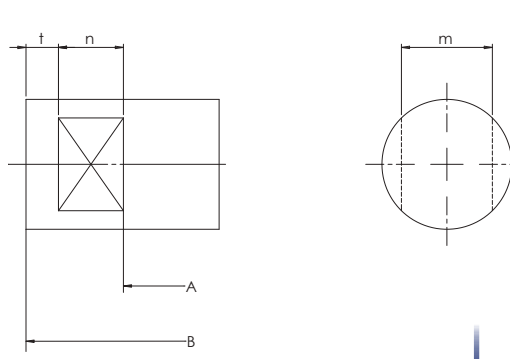
- On a 20 diameter axis tip of 35 diameter flat 30x10.
- On a 25 or 30 diameter axis tip of 45 diameter flat 38x12.

- Standard PNE 53300

Diam axis	Carrier mxn	Return mxn
20	14x10	14x16
25	14x10 (18X10)	14x16 (18X16)
30	22X10	22x16
40	32X10	32x16

► Double W-shaped interior flats mxnxt

This type of flat is advantageous to rigidify the supports. On the other hand, only those anticipated in this way can receive this type of axis. This shape is used very often in the CEMA standard installations. The flat dimensions are defined at ordering because the standard does not give any precision on the liaisons between the axis and the support.



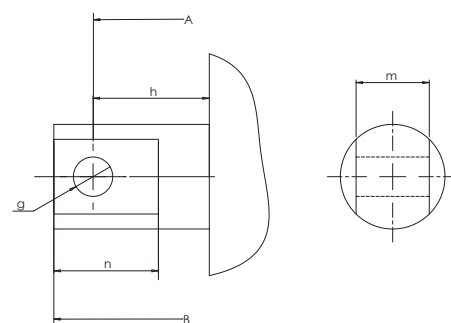
Roller

Conception

► Axis to assemble on an A-shaped chain nxn/gxh

These axes are pierced before receiving the chain which lies between them. In certain cases the holes are pierced by crossing a double flat and in other cases they are pierced directly on its diameter. In cases of interchangeability, the hole diameter and its position must be precised in the order. For our chains, we propose the following dimensions:

Diam	x	y	d	Flat
20	12	16	10.2	
25	12	16	10.2	
30	12	23	12.2	22x32
40	16	29	16.2	32x42
50	24	40	20.2	40x54



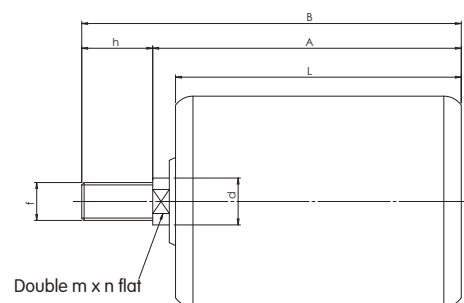
The constructor must assure that these dimensions are compatible with the trough angle anticipated.

► Roller guide shape Gu f x h

Axis of 20 diameter with tail passing 40 mm
Threading M16x30 Flat 17x8

Axis of 25 diameter 25 with tail passing 50 mm
Threading M20x36 Flat 22x9

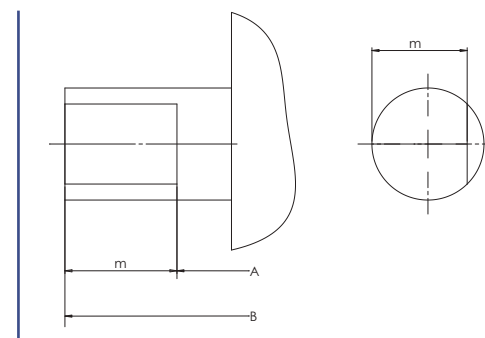
Axis of 30 diameter with tail passing 60 mm
Threading M24x36 Flat 26x10



A roller guide for an axis opens on one side only. It is made to be assembled by slanting on its support. Its fixation is generally made by a nut being pressed into the support against a retaining wall. A flat allows the support of the tail during the tightening of the nut.

► Simple S-shaped flats nxm

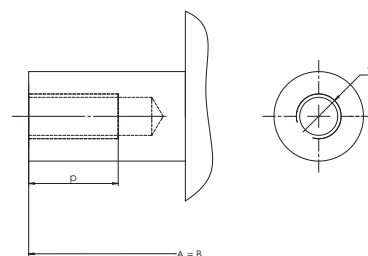
Non-standardized execution.
the dimensions must be defined at ordering.



► T-shaped tapping txh

Advised dimensions

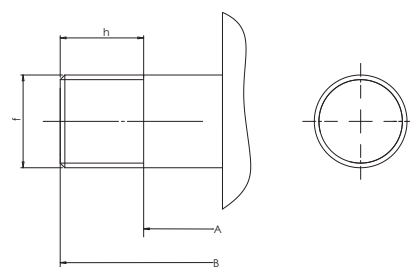
diam. axis	diam. of net t	Depth h
15	M10	15
20	M12	18
25	M16	24
30	M20	30
40	M24	36



► F-shaped threading fxh

Advised dimensions

diam. axis	diam. of net t	Depth h
15	M14	22
20	M20	32
25	M24	40
30	M30	50
40	M40	65

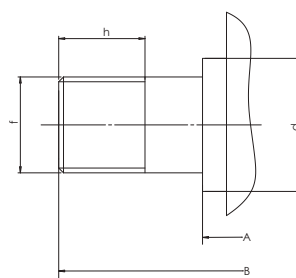


Un pas fin est possible sur demande

► E-shape retaining wall and threading fxh

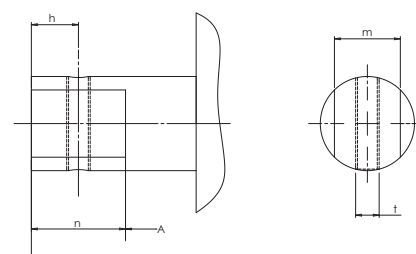
Advised dimensions

diam. axis	diam. of net t	Depth h
15	M12	22
20	M16	28
25	M20	32
30	M24	40
40	M30	50



► Threading between P-shaped flats nxm/txh

The weighed stations are often equipped with rollers offering the possibility of adjusting the height which is made by the aide of a pointed screw being placed between the flats. We define the exact execution plan of this at ordering



► Other possible X-shape executions

Thanks to our digital control towers we can execute a large number of other possible axis shapes. Do not hesitate to contact us.

Roller

Specification

Tube finish

► Finishing by machining

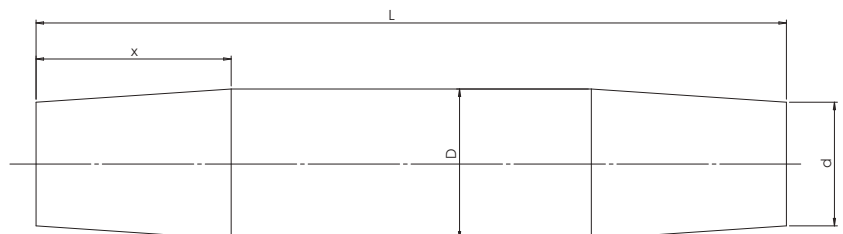
• Cylindrical machining

In order to tighten the tolerances upon the concentric and cylindrical geometric defaults we can machine the tubes on their length. If the length of the tube passes 10 times that of the diameter, we are obliged to use thick tubes without soldering to avoid vibrations during machining. This can have a notable effect on the additional costs of the operation.

This type of machining is often used for the weighing rollers to avoid vibrations that can distort the measurement.

• Bi-conical machining

Bi-conical machining on the drums and control rollers allows the improvement of belt centering. On long tubes, it can be economically advantageous not to machine the central cylindrical part.



$d = D - 1,5\text{mm}$
 $x = 150\text{mm}$ minimum which comprise between $L/4$ and $L/3$

• Milling or knurling

In order to improve the adherence coefficient, it is possible to carry out milling or knurling on the tube. Contact us to define the tube characteristics and its machining.

► Rubber-based surfaces

The rubber surfaces of roller tubes can have several advantages :

- Shock absorbers
- Anti-corrosion
- Anti-sticking
- Anti-abrasion
- Anti-explosion
- Belt tensioning
- Cleanliness of the side of the belt used (food industry)

By means of objective research and of working atmosphere, we can define the material, the longevity and the anti-abrasion coefficient of the surface.

These elastomers are, except contrary specifications, obtained by hot vulcanization by a present thickness of 5 mm with a hardness of 65 Shore A (possibility of a hardness of 45 to 85 Shore A). They can also be coloured black (standard usage) or white for the food-processing industry. Their abrasive resistance is inferior to 150 mm³ (tested following Standard NF ISO 23794).

Possibility of non-spreading flame properties, Standard NF ISO 340

Possibility of anti-static properties, Standard NF ISO 284 and 2878

Possibility of best abrasive resistance: 56 mm³ (Standard NF ISO 23794)

The everyday materials offered by Rouleaux Pack are :

- **Natural rubber**

Used for its performance against abrasion. It improves belt grip, lowers transporting noise and reduces warping. Do not use in contact with hydrocarbons, mineral, vegetable or animal oils and greases.

- **Nitrile**

Remarkable performance in the presence of hydrocarbons, mineral, vegetable or animal oils and greases.

- **Neoprene**

Recommended for its fire and heat resistant properties.

- **EPDM**

Excellent resistance to heat (110 / 120 °C) to water vapor and to the cold. Good chemical resistance to bases, acids and salts. Not resistant to hydrocarbons.

- **Other materials of a rubber base**

We can, with your arrangement, put other materials of a rubber base starting from sleeves or pressed sheets, notably the surfaces of chevrons or spikes, or of Linatex.

- **Other materials of a polyurethane or rubber plastic nature**

We can propose several surfaces of this type, used every-day in the industry but which must be used with moderation in open air because of their poor biodegradability.

► Anti-corrosion protection

- **Zinc coating / Bi-chromic zinc coating**

Electrolyte zinc coating 10/12 microns

White passivation : kept in a saline mist for 180 hours (for information only)

Yellow bi-chromic : kept in a saline mist for 350 hours (for information only)

- **Hot galvanization at 60 to 70 microns**

White passivation with remilling : kept in a saline mist for 800 hours (for information only)

Remark : For process reasons and for economic reasons, it is preferred to have crimped cases than soldered cases in case of zinc coating or galvanization.

- **Peinture**

Paint has a very limited working lifetime, where its main use is to avoid corrosion on installations waiting to be started. In certain cases the paint can also allow a delay in case corrosion and therefore prolong the roller lifetime.

Our paint is a liquid process deployed on a grease-free tube.

Other colors are available upon demand but only for high quantities (please contact us)

yellow	Ral 1023
red	Ral 3020

Remark : Having seen the evolution of the legislation for ground protection against pollution, we advise the constructors and users either to check the compatibility of used paints with the applicable texts or to use non-painted rollers. In order to minimize risks, Rouleaux Pack uses paints without heavy metals.

Roller

Specification

Tubes

Tubes used every day are A37 Tarif 101 rolled soldered tubes, lightly oiled, following Standard NFA EN 102 04/2.2. Rouleaux Pack keeps them in stock in high quantities in order to be able to guarantee the shortest possible delays.

We also keep in stock, but in less quantities, TU37B and TU52B tubes for certain rollers or drums with machined tubes, as well as INOX 304 tubes and plastic tubes (PVC and PEHD). On demand, it is also possible to have High Elastic Limit tubes or other nuances of a better abrasion resistance.

- Tubes for rollers following Standard ISO (O kept in stock in large quantities)

Ø/EP	2.9 ou 3	3.6	4	5	6.3
55				O	
63.5	O				X
70	O			O	
80	O			X	
89	O			O	X
108		O			X
133	O		O		X
159			O		X
168.3				X	X
193					X
219					X

- Tubes for rollers following Standard CEMA

Ø/EP	2.9 ou 3	3.6	4	6.3
63.5	O			X
76	X			
101.6		O		X
127			X	
152.4			X	X
177.8				X
203.2				X

- Tubes for rollers in INOX 304

The nuances kept in stock are : 70x3 - 80x3 - 89x3 - 133x4 - 159x4

- Plastic tubes

The nuances kept in stock are: PVC 50x2.8 - PVC 63x4.7 - PVC 90x6.6 - PEHD 90x8.2 - PEHD 110x10 - PEHD 140x12.7

Stretching

For a 15 diameter we use an H9 calibrated stretching in nuance E24

For a 20 diameter we use an f8 calibrated stretching in nuance E24

For superior diameters we use stretchings in E36 with an over-thickness allowing an h7 tolerance to be made with a roughness inferior to Ra 1.6

The following dimensions are kept in stock : 15 - 20 - 25.4 - 30.4 - 35 - 40.5 - 45 - 51 - 60 - 65

We also keep in stock the stretchings in INOX 304 in the following dimensions : 15 - 20 - 25 - 30

Ball-bearings

We use, for all every-day applications, Series 6xxx deep-filled ball-bearings. In certain cases, for reasons of excessive weight or high lifetime duration, we use the ball-bearings in double rows with Series 21xxx or 22xxx conical rollers.

All of the ball-bearings that we use are produced with steel conforming to Standard NFEN ISO 683-17.

We can use INOX ball-bearings, in cases where the steel used is from the Z100C13 family. The coefficients C and Co must be, in this case, demanded by the manufacturer or for a quick pre-dimensioning to be divided by 2 according to a standard ball-bearing.

We have at our disposal a whole range of solutions for working at high temperatures and we can cover with different choices the ball-bearings and bracket joints of 80° to 350° C (with the speed not passing 100 rev/min).

We insist upon a careful finish of the fillings because a conveyor roller turns slowly (the speed is less than 600 revolutions/minute). In the case of higher speeds, we ask for an electric motor qualification that impose a super finishing on the grooves.

In a conveyor roller, neither the cases nor the axes can be considered as rigid. The ball-bearings with a reduced play cause a cutting of the balls, which can be very detrimental to their lifetime. It is why our Series 6xxx ball-bearings are supplied with a C3 play.

The ball-bearings can be protected either by a metallic deflector or by a joint.

In this case, they are :

- Z a metallic deflector
- ZZ two metallic deflectors
- RS a joint
- 2RS two joints

The ball-bearings ZZ and 2RS are greased at the time of their manufacturing, and we therefore do not choose the grease better adapted to its application. In this case, the grease used is SHELL Alvania R2 or equivalent. (Without ball-bearings of an imposed brand)

The ball-bearings that we use every-day are equipped with ball separation cages of sheet steel. In certain applications, notably coal extraction, the user can ask for ball-bearings in a plastic cage. These ball-bearings, which are more or less economical, can be supplied.

The exterior ball-bearing housings must be N7 type for the sheet steel cases and K7 for the solid cases. We recommend, for the tolerance of a stretched f8 axis of 20 diameter and g7 on machining for the higher diameters. Other tolerances can be used at the clients request; however we draw attention to the installation of two ball-bearing rings which with tightening can cause high forces resulting in either dilatation or a weakened axis, which can significantly reduce the lifetime of the roller.

Roller

Specification

► Characteristics of ball-bearings used

Ball-bearing type	Interior diameter	Exterior diameter	Width	C dynamic in N	C static in N
6202	15	35	11	7800	3750
6204	20	47	14	12700	6550
6205	25	52	15	14000	7800
6206	30	62	16	19300	11200
6305	25	62	17	22400	11400
6306	30	72	19	29000	16300
6307	35	80	21	33500	19000
6308	40	90	23	42500	25000
6310	50	110	27	62000	38000
6312	60	130	31	81500	52000

► Characteristics of double-row ball-and-socket ball-bearings used

Ball-bearing type	Interior diameter	Exterior diameter	Width	C dynamic in N	C static in N
22205	25	52	18	36 000	23 200
22206	30	62	20	49 000	32 000
21306	30	72	19	55 000	35 500
22207	35	72	23	63500	43 000
21307	35	80	21	65 500	41 500
22208	40	80	23	74 000	51 500
21308	40	90	23	83 000	62 500
22308	40	90	33	113 000	78 000
22209	45	85	23	77 500	55 500
21309	45	100	25	101 000	81 500
22309	45	100	36	138 000	99 000
22210	50	90	23	80 000	59 000
21310	50	110	27	120 000	96 500
22310	50	110	40	177 000	126 000
22212	60	110	28	123 000	92 000
21312	60	130	31	161 000	125 000
22312	60	130	46	235 000	186 000

Attention, certain Series 223xx ball-bearings are very difficult to find.

Greases

Grease is an ESSENTIAL element for the roller life. It ensures temperature evacuation of ball-bearings and actively participates in the joint protection of the latter. Rouleaux Pack has selected 4 greases which cover the majority of needs found in conveyor sectors. These greases can sometimes be used jointly (ball-bearing grease is different to that for joints) to optimize performance.

1 - Grease S - Lithium soap grease

This grease is excellent value for money and has very good behavior in the majority of every-day applications and it is used in standard in the absence of particular forces.

2 - Grease H -Synthetic soap grease

This grease is very stable, as well as at high temperatures (until 120°), in the presence of acids, bases or salts, and it has a very pronounced hydrophobic behavior and proves to have an exceptional mechanic stability in the presence of water. Its only default in our applications is that its viscosity is relatively strong which is a slight disadvantage on the rolling coefficient of the roller, but it benefits from a weaker coupled starting compared to other greases of an identical viscosity. We advise therefore that in certain applications to use this grease only in the joints. However, in the ball-bearings, it allows a very high protection against rust and corrosion due to its capacity to support very heavy weights without rupturing the lubricant film. It is used in conveyors for fertilizers, sulphur, chalk, on the coastal areas, in Equatorial environments, in case of high water projections.

3 - Grease B - Polymer-based soap grease without the presence of metallic salts

This grease is very stable in the presence of chemical products; it has a weak viscosity even at a low temperature, which allows it to be used until temperatures of -30°. On the other hand, due to this advantage, its behavior is not as good as the previous grease in the presence of water, but benefits even so from an excellent corrosion resistance. It is used with the PEHD rollers or in cases where the belt badly drives the roller. Because of its weak viscosity it is not recommended for use in high speed applications.

4 - Grease A - This grease is qualified grease that can be used in the food industry

It does not have any other interesting performances compared to the previous products, and we advise that it should be used only in this type of application.

5 - Grease X - A special grease which is not kept in stock and specifically defined for application.

Example : Very high temperatures, ionized environments ...

Characteristics of different greases

Characteristic	S	H	B	A
Thickener	Li – Ca	Ca sulfonates	Polymers	Complex Al
Grade NLGI	2	1/2	2/3	1.5
Drip point °C	160	>300	>230	>250
Base oil	Mineral	Mineral	Mineral	1/2 Synthetic
Viscosity at 40 °C mm ² /s	150	330	82	150
Machine wear of 4 balls	0.8	0.5	0.5	0.5
Temperature limit in °C	-20 / +110	-25 / +180	-30 / +150	-20 / +130

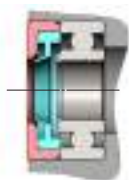
Roller

Specification

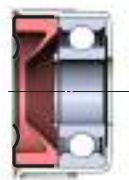
Joints

Rouleaux Pack proposes several types of joints, due to an enriched experience because of long practice in all areas of continued handling.

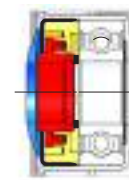
► Joints BA for 15 diameter axis



VBA joint : used with plastic cases

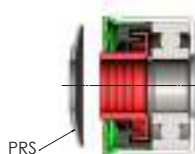


JBA joint: used in conveyors with a light belt

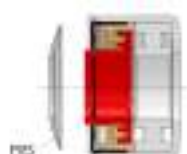


JBAR joint : used in the hardest environments (vegetable washing, cement)

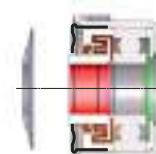
► Joints LM for axes of 20, 25, 30 diameters (henceforth replaced by the M+ joint)



LM204 joint



LM205 joint



LM206/joint LM305 joint

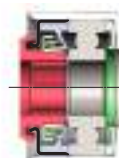
Joints LM for axes of 20, 25, 30 diameters (henceforth replaced by the M+ joint)

In order to reinforce sealing we propose upon demand an entry protection called PRS which allows the roller lifetime to be increased, on the other hand the rolling resistance is higher. (See below)

► M+ joints : Assembled in standard in roller type mine



M+ 204 joint



M+ 305 joint

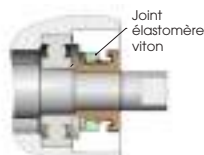


M+ 308 joint

Available M+ joints : 6204, 6205, 6206, 6305, 6306, 6307, 6308

Efficient compact alloy airtight cartridge and weak friction coefficient. The OYO system also has : an external protection by a labyrinth formed by the deflector in PEHD and a flared cover extremity in steel (zinc or stainless steel upon demand). A double internal sealing, formed by a polyurethane elastomer joint, forming labyrinths and airtight edges, with the material being resistant to all chemical aggression. A third sealing formed by a contact between the rear part of the joint and the sides of the roller bearing rings.

► Special joints



Rouleau haute température 150°C
Ambiance sidérurgie



Working at high temperature in iron and steel manufacturing | Joint for 50 and 60 diameter axis in mining environment

We specifically study on demand the specific joints adapted to all types of application (high temperature in iron and steel manufacturing environments, particular chemical products, ionized environments

Standardisation and usage

► Summary of Standard CEMA

The rollers are classed into 6 categories from A to F, a number giving the tube diameter in inches (25.4 mm) completing the designation.

Theoric lifetime	conditions	Belt	Class diameter	101.6 4'	127 5'	152.4 6'	177.8 7'	203.2 8'
15000	Standard	18" - 48"	A	X	X			
30000	Standard	18" - 48"	B	X	X			
30000	Standard	18" - 60"	C	X	X	X		
60000	Dirty	24" - 72"	D		X	X		
60000	Very dirty	36" - 96"	E			X	X	
60000	Very dirty	60" - 96"	F			X	X	X

The method of CEMA calculations available on our site allow the category choice by means of the conveyor working conditions. By these means, we propose the following pre-dimensions. (These are before being checked by a calculation, case by case)

Class	Axis diameter	Ball-bearing
A	20	6204
B	20	6204
C	25	6305 (6205)
D	30	6306 (6206)
E	40 (35)	6308 (6307)
F	(50) (60)	(6310) (6312)

► Belt equivalents in inches and belts in mm

Dimension in inches	Dimension in mm	Equivalent ISO 53301	Equivalent ISO 53300
18	457.2	500	500
24	609.6	650	600
30	762	800	800
36	914.4	1000	900
42	1066.8	1000	1000
48	1219.2	1200	1200
54	1371.6	1400	1400
60	1524	1600	1600
72	1828.8	1800	1800
84	2133.4	2000	2000
96	2438.4	2400	2400

Length of tube on Standard CEMA installations

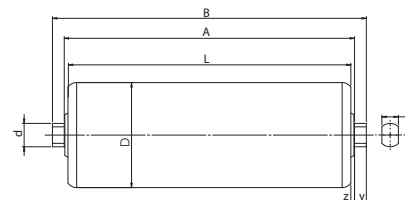
The rollers are not the object of standardization, the tube lengths can vary up to 20 mm between different constructors. Furthermore, certain constructors adapt the dimensions of length by means of roller class or of its diameter. In alternative cases, it is imperative to measure the dimension between iron supports or, between flats, of rollers by carefully precisising whichh are being measured, the tube length, the length without all the axis which have a flat shape must also be communicated for information only.

Roller

Specification

Roller dimension by means of Standard

The dimensions given in this paragraph are recalled in the fourth page of coverage in order to be more easily accessible during all the reading of this catalogue.



► NFE 53301 ISO 1537 DIN 15207

Belt width	Trough	V shaped trough	A flat
300		200/208/232 (* 226)	400/408/432 (* 426)
400	160 /168/192 (* 186)	250/258/282 (* 276)	500/508/532 (* 526)
500	200/208/232 (* 226)	315/323/347 (* 341)	600/608/632 (* 626)
650	250/258/282 (* 276)	380/388/412 (* 406)	750/758/782
800	315/323/347 (* 341)	465/473/497 (* 491)	950/958/982
1000	380/388/412 (* 406)	600/608/632 (* 626)	1150/1158/1182
1200	465/473/497 (* 491)	700/708/732 (670/678/702)	1400/1408/1432
1400	530/538/562 (* 556)	800/808/832 (750/758/782)	1600/1608/1632
1600	600/608/632 (* 626)	900/908/932	1800/1808/1832
1800	670/678/702	1000/1008/1032	2000/2008/2032
2000	750/758/782	1100/1108/1132 (1150/1158/1182)	2200/2208/2232
2200	830/838/862	1200/1208/1232	2400/2408/2432
2400	900/908/932	1300/1308/1332	2600/2608/2632

Remarks : (*) For rollers < 600 mm an axis of 20 mm the overall side length of axis B is shortened by 6 mm and the flats have a length of 9 mm.

For rollers of 127 diameter or more the dimension L, can on demand, be shortened by 5 mm, the dimensions A and B being unchanged. It is in this interest to avoid interferences between rollers in the supports of deep troughs.

Wear of the V-shaped trough can be used :

- For belts of 300 to 800 in superior parts
- For belts of 1000 or more in inferior parts

► FLAT DIMENSION

SUPERIOR ROLLERS

Axis diameter	X	Y	Z
15	10 (8 possible)	9	4
20	14	9	4
25	18	12	4
30	22	12	4
40	32	12	4

INFERIOR ROLLERS

Axis diameter	X	Y	Z
15	10 (8 possible)	12	4
20	14	12	4
25	18	12	4
30	22	12	4
40	32	12	4

► PNE 53300 Old project of a French Standard replaced by the ISO Standard.

This Standard is very much used, notably for the change of old installations. For this reason, Rouleaux Pack keeps in stock certain rollers of this Standard as well as those of the ISO Standard.

Belt width	Trough	V-shaped trough	A flat
300		190/196/216	375/408/440
350	125/131/151	215/221/241	425/458/490
400	150/156/176	240/246/266	475/508/540
500	190/196/216	290/296/316	575/608/640
600	230/236/256	340/346/366	675/708/740
650	240/246/266	360/366/386	725/758/790
700	255/261/281	390/396/416	775/808/840
800	290/296/316	430/436/456	875/908/940
900	325/331/351	500/506/526	1015/1048/1080
1000	360/366/386	575/581/601	1115/1148/1180
1200	430/436/456	675/681/701	1315/1348/1380
1400	500/506/526	775/781/801	1515/1548/1580
1600	570/576/596	875/881/901	1715/1748/1780
1800	640/646/666	975/981/1001	1915/1948/1980

Remark : For the rollers of a 127 diameter and more the dimension L is shortened by 5 mm, the dimensions A and B are unchanged. It is in this interest to avoid the interferences between the rollers in the supports of deep troughs.

► FLAT DIMENSION

SUPERIOR ROLLERS

Axis diameter	X	Y	Z
15	10 (8 possible)	10	3
20	14	10	3
25	14 (18 possible)	10	3
30	22	10	3
40	32	10	3

INFERIOR ROLLERS

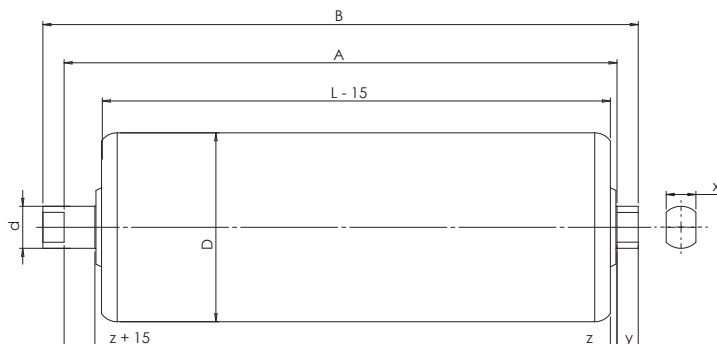
Axis diameter	X	Y	Z
15	10 (8 possible)	16	16,5
20	14	16	16,5
25	14 (18 possible)	16	16,5
30	22	16	16,5
40	32	16	16,5

Roller

Specification

► Transport rollers

Rouleaux Pack proposes and keeps in stock rollers with short and transported tubes. The use of lifting rollers gives an advantage by facilitating in certain cases the flow of transported materials by increasing the space between the support and the roller. In this way, the blocking risk becomes less.



Recommendations

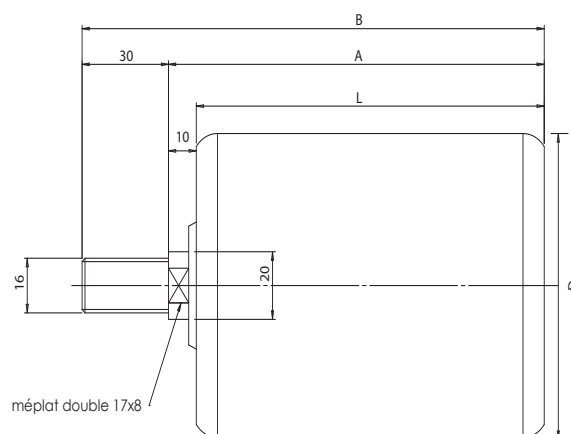
- To use with highly-sealed products
- With products of a neighboring granulometry of three millimeters
- With crystalized products (salt, frost).

► Guiding rollers

The guiding rollers are rollers anticipated to be fixed on their support on one side, the other side being on a no exit axis. They are used on auto-centered stations.

Rouleaux Pack keeps the following guiding rollers in stock :

L/D	55	63,5	70	89
100	X	X	X	X
120	X	X	X	X
150			X	X



Maximum speed of use

The standard rollers are conceived and manufactured to function with a speed of 600 revolutions per minute. In case of this level being passed, we must define the measures to be taken together.

Roller diameter	Belt speed limit
38	1,2
60	1,9
70	2,2
80	2,5
89	2,8
108	3,4
133	4,2
159	5,0
178	5,6
193	6,0

Tube diameter by means of the belt width

The tube diameter must be, as a priority, chosen by means of the speed and type of rolling in relation to the lifetime and the weight put upon the roller. However it is necessary that the choice of different parameters be consistent. In the usual applications, the following table gives the choices which correspond to this consistency

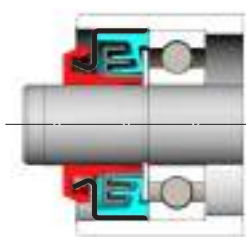
Belt width	6204	6205	6305	6206	6306	6308
400	63.5/70/89					
500	63.5/70/89					
650	63.5/70/89	89	89			
800	89/108/133	89/133	89/133			
1000	89/108/133	89/133	108/133/159	108/133/159	133/159	
1200	108/133	133	108/133/159	108/133/159	133/159	159
1400			133/159		133/159	159
1600			133/159		133/159	159
1800					133/159	159/193
2000					159	159/193
2200					159	159 /193

Roller

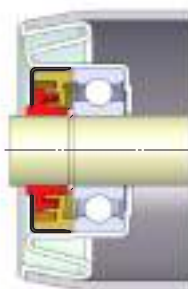
Specification

Tube casing liaisons

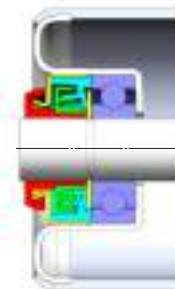
According to the bearing housing shape, the liaison of the latter with the tube can be made following different procedures. In order to be as precise as possible in the description of our products we have written here all of the possible procedures and we have referred to these descriptions in the following tables



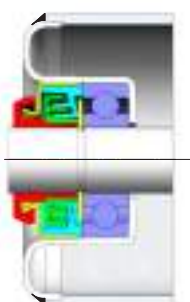
A : liaison without bearing housing



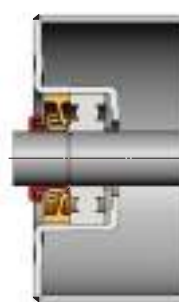
B: crimped steel bearing housing in S



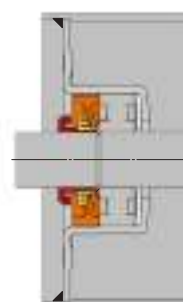
C : wing returned crimped bearing housing



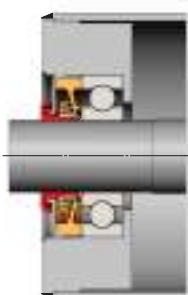
D : wing returned welded steel bearing housing



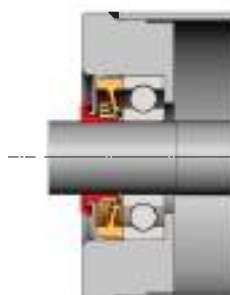
E : flat-edged wing returned welded steel bearing house



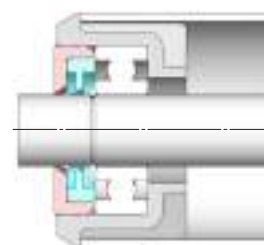
F : welded flat-edged bearing house of tube interior



G : welded solid bearing housing on edge



H : welded solid bearing housing on full shaft

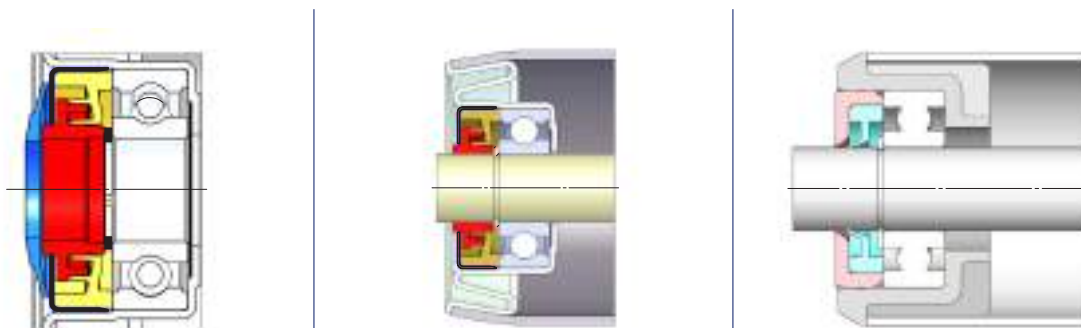


I : fitting a plastic bearing housing

Roller

Roller type BA 202, shaft 15

Rollers for a light belt mounted on an shaft of 15 diameter destined for use in the food processing industry or for light conveyors.



Shape A

Shape B

Shape I

Tube diameter	Tube thickness	Liaison bearing housing	Material/bearing housing thickness	Possible joints	base	prop
38	2	A		Ba Ba+	0.24	3.3
40	4	A		Ba Ba+	0.24	5.3
60	2	B	1.5	Ba Ba+	0.4	4.3
60	2.9	B	1.5	Ba Ba+	0.4	5.7
63.5	2.9	B	1.5	Ba Ba+	0.4	5.9
70	2	B	1.5	Ba Ba+	0.42	4.8
70	2.9	B	1.5	Ba Ba+	0.42	6.4
50 PVC	2.8	I	Polypropylène	VBA	0.3	2.0
63 PVC	4.7	I	polypropylène	VBA	0.33	1.7

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

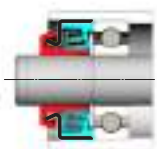
Options :

- Possibility of STEEL rollers in BA+ 38x2
- Steel tube available in 60x2 70x2 63.5x2.9 diameters
- STAINLESS STEEL shaft available in 15 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease
- Sealing reinforced on liaison tube bearing housings in 60x2.9 and 70x2.9
- Tube or painted coating

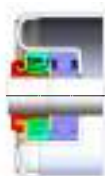
Roller

Roller type LM or M+ 204, shaft 20

A roller type most used in quarries and everyday installations, it is optimized at cost price due to large series launches, especially in 89 and 133 diameters, and numerous dimensions are stocked by Rouleaux Pack in order to guarantee rapid availability.



Shape A



Shape C



Shape D



Shape E

Tube dia	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
55	5	A		LM (PRS) ou M+	0.45	9.2
63.5	2.9	C	2	LM (PRS) ou M+	0.7	7
63.5	6.3	D	2	LM (PRS) ou M+	0.7	12.3
70	2.9	C	2	LM (PRS) ou M+	0.73	7.5
70	5	D	2	LM (PRS) ou M+	0.73	11.1
70	6.3	D	2	LM (PRS) ou M+	0.73	13.3
76	2.9	E	2	LM (PRS) ou M+	0.75	7.9
80	2.9	D	2	LM (PRS) ou M+	0.75	8.2
80	5	D	2	LM (PRS) ou M+	0.75	12.3
89	3	C	2	LM (PRS) ou M+	0.8	9.0
89	5	D	2	LM (PRS) ou M+	0.8	13.4
89	6.3	D	2	LM (PRS) ou M+	0.8	16.2
101.6	3.6	E	2.5	LM (PRS) ou M+	1	11.5
101.6	6.3	E	2.5	LM (PRS) ou M+	1	18.2
108	3.6	E	2.5	LM (PRS) ou M+	1.05	12
108	6.3	E	2.5	LM (PRS) ou M+	1.05	19.2
114	4	E	3	LM (PRS) ou M+	1.20	13.7
127	4	E	3	LM (PRS) ou M+	1.3	14.9
127	6.3	E	3	LM (PRS) ou M+	1.3	22.1
133	3	E	3	LM (PRS) ou M+	1.35	12.3
133	4	E	3	LM (PRS) ou M+	1.35	15.5
133	6.3	E	3	LM (PRS) ou M+	1.35	23.0

Roller mass : $M = \text{base} + \text{prop} \times L$ in kg

Note : The superior rollers with joints M+ 89 or 133 diameter are mounted automatically with a deformed ring in place of clips, the others being assembled in a traditional method with circlips.

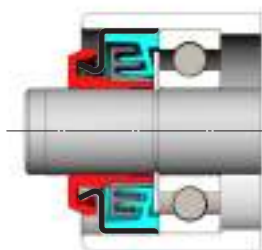
Options :

- Possibility of STAINLESS STEEL rollers in 70 and 89 diameters
- Stainless steel tube available in 63.5x2.9 80x3 133x4 159x4 diameters
- STAINLESS STEEL shaft available in 20 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joint
- Welded bearing housings in D shape in place of crimps
- Solid bearing housings in steel carbon or stainless steel with bearings 6204
- Machined carrying bearings h7 for high speeds
- Reinforced shaft 25/20 diameter for high loads or vibration problems
- Tube or painted coating

Roller

Roller type LM or M+ 205, shaft 25

An economical shaft roller of 25 diameter, used in applications without particular forces and without a notable need for longevity. In this case, roller 305 is preferred.



Shape A

Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
60	5	A	3	M+	0.9	11.3
89	3	E	3	M+	1.1	10.5
89	5	E	3	M+	1.1	14.9
101.6	3,6	E	3	M+		
101.6	6,3	E	3	M+		
108	3,6	E	3	M+		
108	6,3	E	3	M+		
114	4	E	3	M+		
127	4	E	3	M+		
127	6,3	E	3	M+		
133	3	E	3	M+		
133	4	E	3	M+	1.7	17
133	6,3	E	3	M+	1.7	24.5

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

Note : Shaft 25.4 diameter machined 25 h8 in semi-hard stainless steel.

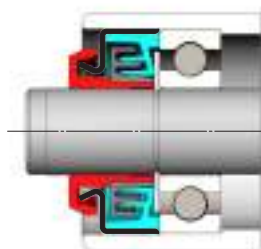
Options :

- Stainless steel tube available in 89x3 133x4 diameters
- STAINLESS STEEL shaft available in 25 diameter
- Bearings ZZ or 2RS on demand
- STAINLESS STEEL bearings or high temperature, special grease, special joint
- Welded bearing housings in D shape in place of crimps
- Solid bearing housings in carbon steel or stainless steel with 6205 or 21205 or 22205 bearings
- Tube or painted coating

Roller

Roller type LM or M+ 206, shaft 30

An economical shaft roller of 30 diameter, used in applications without particular forces and without a notable need for longevity. In this case, the roller 306 is preferred.



Shape A

Shape E

Tube dia	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
70	5	A		LM (PRS) ou M+	0.9	14.2
89	3	E	3	LM (PRS) ou M+	1.2	12.1
89	5	E	3	LM (PRS) ou M+	1.2	16.5
89	6.3	E	3	LM (PRS) ou M+	1.2	19.3
101.6	3.6	E	3	LM (PRS) ou M+	1.3	14.6
101.6	6.3	E	3	LM (PRS) ou M+	1.3	21.3
108	3.6	E	3	LM (PRS) ou M+	1.4	15.1
108	6.3	E	3	LM (PRS) ou M+	1.4	22.3
114	4	E	3	LM (PRS) ou M+	1.55	16.8
127	4	E	3	LM (PRS) ou M+	1.7	18.0
127	6.3	E	3	LM (PRS) ou M+	1.7	25.2
133	4	E	3	LM (PRS) ou M+	1.8	18.6
133	6.3	E	3	LM (PRS) ou M+	1.8	26.1
152.5	4	E	4	LM (PRS) ou M+	2.3	20.5
152.5	6.3	E	4	LM (PRS) ou M+	2.3	29.1
159	4	E	4	LM (PRS) ou M+	2.4	21.2
159	6.3	E	4	LM (PRS) ou M+	2.4	30.1

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

Note : Shaft 30.4 diameter machined 30 h8 in semi-hard stainless steel.

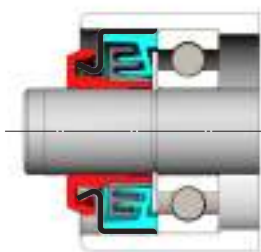
Options :

- Stainless steel tube available in 89 x 3 133 x 4 159 x 4 diameter
- STAINLESS STEEL shaft available in 30 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joint
- Welded bearing housings in D shape in place of crimps
- Solid bearing housings in carbon steel or stainless steel with 6206 or 21206 or 22206 bearings
- Tube or painted coating

Roller

Roller type LM or M+ 305, shaft 25

A roller for intensive work with an shaft of 25 diameter, used in applications that necessitate good reliability in cases of medium loads. Typically used in mining with belts of 1000 to 1400 mm



Shape A

Shape E

Tube dia	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
70	5	A		LM (PRS) ou M+	0.9	12.6
89	3	E	3	LM (PRS) ou M+	1.2	10.5
89	5	E	3	LM (PRS) ou M+	1.2	14.9
89	6.3	E	3	LM (PRS) ou M+	1.2	17.7
101.6	3.6	E	3	LM (PRS) ou M+	1.3	13.0
101.6	6.3	E	3	LM (PRS) ou M+	1.3	19.7
108	3.6	E	3	LM (PRS) ou M+	1.4	13.5
108	6.3	E	3	LM (PRS) ou M+	1.4	20.7
114	4	E	3	LM (PRS) ou M+	1.55	15.2
127	4	E	3	LM (PRS) ou M+	1.7	16.4
127	6.3	E	3	LM (PRS) ou M+	1.7	23.6
133	4	E	3	LM (PRS) ou M+	1.8	17.0
133	6.3	E	3	LM (PRS) ou M+	1.8	24.5
152.5	4	E	4	LM (PRS) ou M+	2.3	18.9
152.5	6.3	E	4	LM (PRS) ou M+	2.3	27.5
159	4	E	4	LM (PRS) ou M+	2.4	19.6
159	6.3	E	4	LM (PRS) ou M+	2.4	28.5

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

Note : Shaft 25.4 diameter machined 25 h8 in semi-hard stainless steel.

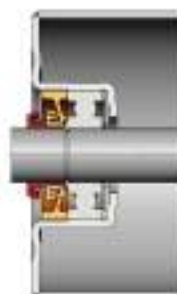
Options :

- Stainless steel tube available in 89x3 133x4 159x4 diameter
- STAINLESS STEEL shaft available in 25 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joint
- Welded bearing housings in D shape in place of crimps
- Solid bearing housings in carbon steel or stainless steel with 6305 or 21305 or 22305 bearings
- Reinforced shaft of 30/25 diameter
- Tube or painted coating

Roller

Roller type M+ 306, shaft 30

A roller for intensive work with a 30 diameter shaft, used in applications that necessitate good reliability in the case of strong loads. Typical use in mining for belts of 1400 to 1800 mm



Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
108	3.6	E	4	M+	2.7	15.1
108	6.3	E	4	M+	2.7	22.3
114	4	E	4	M+	2.9	16.8
127	4	E	4	M+	3.1	18.0
127	6.3	E	4	M+	3.1	25.2
133	4	E	4	M+	3.2	18.6
133	6.3	E	4	M+	3.2	26.1
152.5	4	E	4	M+	3.5	20.5
152.5	6.3	E	4	M+	3.5	29.1
159	4	E	4	M+	3.6	21.2
159	6.3	E	4	M+	3.6	30.1

Roller mass : $M = \text{base} + \text{prop} \times L$ in kg

Note : Shaft of 30.4 diameter machined 30 h8 in semi-hard stainless steel.

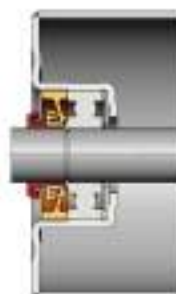
Options :

- Stainless steel tube available in 133x4 and 159x4 diameters
- STAINLESS STEEL shaft available in 30 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joint
- Solid bearing housings in carbon steel or stainless steel with 6306 or 21306 or 22306 bearings
- Reinforced shaft of 35/30 diameter
- Tube or painted coating

Roller

Roller type M+ 307, shaft 35

A roller for intensive work with a 35 shaft diameter, used in applications that necessitate good reliability in the case of high loads. Used mainly with CEMA Standards.



Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
108	3.6	E	4	M+	2.9	17.4
108	6.3	E	4	M+	2.9	24.6
114	4	E	4	M+	3.1	19.1
127	4	E	4	M+	3.3	20.3
127	6.3	E	4	M+	3.3	27.5
133	4	E	4	M+	3.4	20.9
133	6.3	E	4	M+	3.4	28.4
152.5	4	E	4	M+	3.7	22.8
152.5	6.3	E	4	M+	3.7	31.4
159	4	E	4	M+	3.8	23.5
159	6.3	E	4	M+	3.8	32.4
177.8	6.3	E	4	M+	4.0	37.8

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

Note : Shaft of 36 diameter machined 35 h8 in semi-hard stainless steel

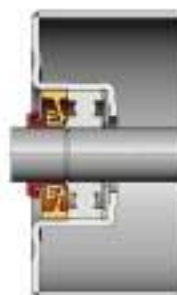
Options :

- Stainless steel tube available in 133x4 and 159x4 diameters
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joints
- Solid bearing housings in carbon steel or stainless steel with 6307 or 21307 or 22307 bearings
- Reinforced shaft of 40/35 diameter
- Tube or painted coating

Roller

Roller type M+ 308, shaft 40

A roller for intensive work with a 40 diameter shaft, used in applications that necessitate good reliability in the case of very heavy loads.



Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
108	3.6	E	4	M+	3.2	19.8
114	4	E	4	M+	3.3	21.5
127	4	E	4	M+	3.4	22.7
127	6.3	E	4	M+	3.4	29.9
133	4	E	4	M+	3.5	29.3
133	6.3	E	4	M+	3.5	30.8
152.5	4	E	4	M+	3.7	25.2
152.5	6.3	E	4	M+	3.7	33.8
159	4	E	4	M+	3.8	25.9
159	6.3	E	4	M+	3.8	34.8
177.8	6.3	E	4	M+	4.1	37.7
193.7	6.3	E	4	M+	4.5	40.2

Roller mass : $M = \text{base} + \text{prop} \times L$ in kg

Note : Shaft of 41 diameter machined 40 h8 in semi-hard stainless steel

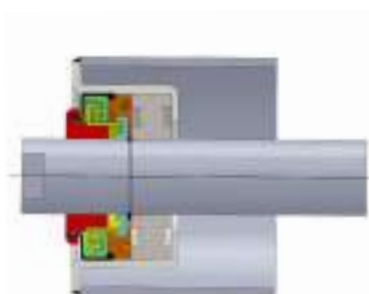
Options :

- Stainless steel tube available in 133x4 and 159x4 diameters
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joints
- Solid bearing housings in carbon steel or stainless steel with 6308 or 21308 or 22308 bearings
- Reinforced shaft of 45 /40 diameter
- Tube or painted coating

Roller

Roller type M+ 310, shaft 50

A roller for very intensive work with a 50 diameter shaft, used in applications that necessitate good reliability in the case of very heavy loads.



Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
127	4	E	5	M+	6.3	28.3
127	6.3	E	5	M+	6.3	35.5
133	4	E	5	M+	6.4	28.9
133	6.3	E	5	M+	6.4	36.4
152.5	4	E	5	M+	6.6	30.8
152.5	6.3	E	5	M+	6.6	39.4
159	4	E	5	M+	6.7	31.5
159	6.3	E	5	M+	6.7	40.4
177.8	6.3	E	5	M+	7.3	43.3
193.7	6.3	E	5	M+	8.0	45.8

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

Note : Shaft of 51 diameter machined 50 h8 in semi-hard stainless steel

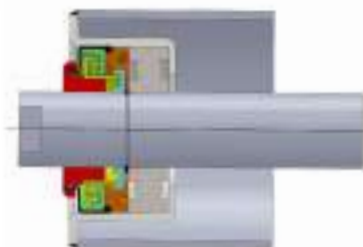
Options :

- Stainless steel tube available in 133x4 and 159x4 diameters
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joints
- Solid bearing housings in carbon steel or stainless steel with 6310 or 21310 or 22310 bearings
- Reinforced shaft of 55 /50 or 60/50 diameter
- Tube or painted coating

Roller

Roller type M+ 312, shaft 60

A roller for very intensive work with a 60 shaft diameter, used in applications that necessitate good reliability in the case of very heavy loads.



Shape E

Tube diameter	Tube thickness	Liaison bearing housings	Material/bearing housing thickness	Possible joints	Base	Prop
152.5	4	E	4	M+	8.4	37.7
152.5	6.3	E	4	M+	8.4	46.3
159	4	E	4	M+	8.5	38.4
159	6.3	E	4	M+	8.5	47.3
177.8	6.3	E	6	M+	9.2	50.2
193.7	6.3	E	6	M+	10.0	52.7

Roller mass : $M = \text{base} + \text{prop} * L$ in kg

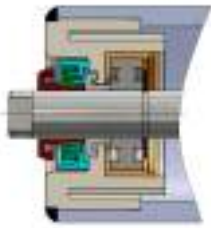
Note : Shaft of 61 diameter machined 60 h8 in semi-hard stainless steel

Options :

- Stainless steel tube available in 159x4 diameter
- Bearings ZZ or 2RS on demand
- Stainless steel bearings or high temperature, special grease, special joints
- Solid bearing housings in carbon steel or stainless steel with 6312 or 21312 or 22312 bearings
- Reinforced shaft of 65 /60 diameter
- Tube or painted coating

Roller

PEHD Rollers



► Specifications

- Strong thick tube of 90x8.2, 110x10, 133x10, 160x14 diameters possibility 140x12,5.
- Thermo-welded bearing housings : perfectly sealing with liaison bearing housings
- OYO joint + : 6204, 6305, 6206 having been proved in all areas
- Polyurethane stress distribution rings : for avoiding lamination of the carrying roller
- Possibility of putting an anti-bending casing in the center or a stainless steel tube to avoid bending of long rollers
- Joints systematically equipped with a very chemically inert grease and very fluid with a good stability in the presence of water

► The advantages of PEHD rollers are the following :

- Chemical resistance : The high density polyéthylène is, chemically, very inert, coupled with deflectors and shafts in stainless steel, its use gives excellent results in corrosive environments.
- Reduced weight and inertia
- Anti-clogging
- Reduced noise
- Compatible with food-processing products
- Weak friction coefficient : the sliding of the belt is favored

► The disadvantages are :

- Elasticity module is limited by weak ruptures compared to steel
- Weak durability : usage risks troughing and bending
- Weak friction coefficient : belt guiding is more difficult.

► Lifetime

The PEHD rollers are anticipated to be more resistant than steel rollers, in certain difficult conditions, however weak tube mechanical performances can, in certain cases, strongly limit their lifetime. The best way to check the economical interests of these rollers is to make comparative tests "in situ". In all these cases we must avoid to put them under loading hoppers, troughing or on heavily loaded conveyors.

► Range available

Ø Tube	Ø Axe	Ball-bearing type	The speed maximum	Mass
90x8,2	20	6204	1,5	0,5+Lx4,5
110x10	20	6204	1,8	0,6+Lx5,5
133x10	20	6204	2,2	0,93+Lx6,5
133x10	25	6305	2,2	1,78+Lx7,83
133x10	30	6206	2,2	1,88+Lx9,51
140x12,5	20	6204	2,2	0,78+Lx7,4
160x14	25	6305	2,7	1,95+Lx9,83
160x14	30	6206	2,7	2,06+Lx11,5

Roller

Type AM impact rollers

The impact rollers are equipped upon their shaft a set of juxtaposed rubber rings which allow the absorption of shocks caused by falling materials in the unloading areas.



D2\D1	89	108	133	159	180	193	215
55	28						
63.5	35	35					
70		35	35				
89			35	35/40/50			
108				40/50	40	40	
133					40	45	50
159							40

In the table below, the given widths are for information and are susceptible to modification without advance notice.

- Anti-abrasion coefficient 190 mm³ (test following Standard NF ISO 23794)
- All impact rollers are equipped with rings or stopping rings
- Tolerance on outside diameter +/- 2mm
- The rings are mounted in such a way as to cover the maximum length of the shaft while keeping space for being able to mount the stoppers

Options :

- White rings for the food-processing industry
- Nitrile rings for contact with hydrocarbons
- Anti-static rings and auto-extinguishing rings for ATEX environments
- Rings with an improved anti-abrasion coefficient (only with certain dimensions).

Roller

Type AC or ACE anti-clogging roller

A roller used for belt return where the dirty side of the belt is in contact with the shaft. It facilitates the evacuation of clogged fertilizer, clay and laterite materials and prevents their accumulation which can harm the functioning of the installation. For difficult applications, the plastic diagonal braces are in fact beneficial and for wide belts the edge supports with sleeves are advised.

► Rings available (width)

D2\D1	89	108	133	159	180	193
63.5	25	25				
70			25			
89			25	25		
108				35	35	35

- These dimensions are susceptible to being modified without advance notice
- The standard rings are in natural black rubber 65+/- 5 shore A
- Anti-abrasion coefficient 190 mm 3 (test following Standard NF ISO 23794)
- The AC rollers are mounted with rings supported by simple tightening
- Tolerance on outside diameter +/- 2mm and on positioning +/- 5mm
- In standard the rings are mounted in dissymmetric methods in staggered rows of mounted rollers giving the most efficient anti-clogging.

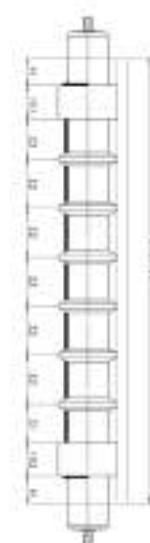
• Options :

- White rings for the food-processing industry
- Nitrile rings for contact with hydrocarbons
- Anti-static rings and auto-extinguishing rings for ATEX environments
- Rings with an improved anti-abrasion coefficient
- Possibility of making ACE rollers with diagonal braces and stop rings at the ends

► Ring position in relation to the belt width

Following PNE 53300 and NFE 53301

Belt	Nbr of rings	H	Z2	Z1
400	5	27.5	130	95
500	6	30	130	60
600	7	20	130	50
650	7	22.5	130	95
700	7	30	130	130
800	8	32.5	130	95
900	9	35	130	60
1000	10	25	130	50
1200	11	37.5	130	95
1400	13	27.5	130	55
1600	14	25	130	130
1800	16	30	130	60
2000	17	30	130	130



Roller

Type ACM or ACME flat-ringed anti-clogging rollers

These rollers, like the previous, are used for belt return transporting clogging products, where the flat rings allow a better belt edge support and do not destroy the ends of the rings.

Flat rings available (available rings : see previous paragraph)

D2\D1	108	133	159	180	193
63.5	50				
70		50			
89		50	50		
108			50	50	50

- Dimensions susceptible to modification without advance notice
- Rings in natural black rubber 65 +/- 5 shore A
- Anti-abrasion coefficient 190 mm³ (test following Standard NF ISO 23794)
- Tolerance on outside diameter +/- 2mm
- Tolerance on positioning +/- 5mm
- The rings are mounted in a dissymmetric method but the flat rings are mounted in a symmetric method.

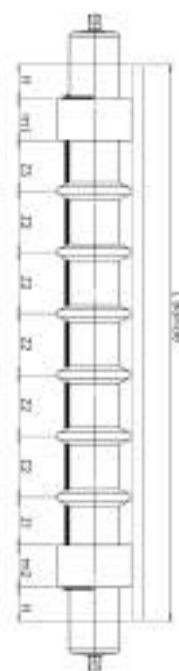
Options :

- Rings with a more efficient anti-abrasion coefficient
- Possibility of putting joined rings to replace the flat rings
- Possibility of ACME rollers with plastic spacers and stop rings at the ends

Ring position in relation to the belt width

Belt	Flat ring width	For flat return				
		Nbr of rings	H	Z3	Z2	Z1
400	50	2	20	82.5	130	47.5
500	50	2	35	82.5	130	117.5
600	100	2	35	82.5	130	117.5
650	100	3	30	82.5	130	47.5
700	100	3	37.5	82.5	130	82.5
800	100	4	22.5	82.5	130	82.5
900	100	5	25	82.5	130	47.5
1000	150	5	25	82.5	130	47.5
1200	150	6	25	82.5	130	117.5
1400	150	8	30	82.5	130	47.5
1600	200	8	45	82.5	130	117.5
1800	200	10	32.5	82.5	130	82.5
2000	200	12	20	82.5	130	47.5

For V-shaped return						
Belt	Flat ring width	Nbr of rings	H	Z3	Z2	Z1
1200	150/50	2	30	82.5	130	82.5
1400	150/50	3	35	82.5	130	47.5
1600	200/100	3	25	82.5	130	82.5
1800	200/100	4	30	82.5	130	47.5
2000	200/100	4	60	82.5	130	117.5



Roller

Type DSA or DSC cleaning rollers

The cleaning rollers are used for belt return, with the aim of cleaning the belts. Two type of cleaning rollers exist : those with rubber spirals and those with steel spirals. The latter is more efficient but the belts deteriorate quicker.



Cleaning rollers with rubber spirals



Cleaning rollers with steel spirals

► Cleaning rollers with rubber spirals

D2/D1	89	108	133	180
63.5	35	40		
89			43	
108				40

- Dimensions susceptible to modification without advance notice
- Rings in natural black rubber 65 +/- 5 shore A
- Anti-abrasion coefficient 190 mm³ (test following Standard NF ISO 23794)
- Rollers with maximum length covered by a number of ring pairs and with welded stop rings

► Cleaning rollers with steel spirals

- Only exist in 133 diameter on a 70 diameter base
- All lengths possible up to 1600
- Possibility of shaft diameters 20 (6204), 25(6305), 30(6206)

Return rollers for type BT bracket belts

It is possible to mount discs of large diameters on the return rollers in order to support the belt by leaving the bracket passage

Tube diameter	Disc diameter	thickness
55	215	50
63.5	200	45
	250	45
	330	50
89	275	40
	355	50
108	194	50
133	194	50
	220	50



If possible, choose the 89x275 discs which are available in stock.

Roller

Bending and force rollers

These rollers must be protected against catching risks, such as category C drums in the Standard ISO 3684

► Bending rollers

The bending rollers follow a deviation angle which when passed onto the belt can receive very variable forces. They can therefore be, depending on the case, be conceived as over-dimensioned carrying rollers or rollers with solid bearing housings with bearings of rows of ball bearings or double rows of conical rollers

► Force rollers

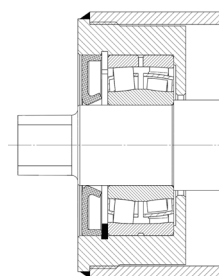
The force rollers are produced with solid bearing housings and of ball-and-socket bearings on the rollers. In certain cases the bolted bearings applied on the flanges can act as a bearing housing. In these two cases, the shaft must be immobilized on one side and free on the other in order that the bending does not generate supplementary forces on the bearings

- Following the applications the shaft can be unrefined, or cylindrically or biconically machined.
- Maximum dimensions offered by Rouleaux Pack
- Tube diameter 219 thickness 12
- Shaft diameter 65 low-cut diameter 60 under bearings
- Length inferior to 3 meters
- For shafts of 50 and 60 mm diameters, the joints are defined according to the demand

► Force roller housing bearings

Advised bearings in relation to tube and shaft diameter.

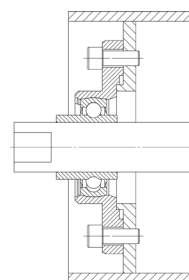
	30	40	50
133	22206	22208	
159	22206	22208	
193		21308	21310
219		21308	21310



► Force rollers with applied bearings

Auto-aligning bearings in steel sheets with dynamic coefficient (N) in relation to the shaft and tube diameter.

	40	50	60
159	18200	23200	
193	18200	23200	
219			32800



Rouleaux Pack proposes small drums beginning with the following dimensions :

- Inferior tube with a 219 diameter and a thickness inferior to 12
- Inferior shaft with 65 diameter
- All lengths inferior to 3 meters

Usage is possible up to 3 meters in measure where the tube is chosen in a way to limit vibrations during use. (Tube without welding, high thickness, high diameter/length ratio). In certain cases, it would be judicious not to use end cones by leaving the central cylindrical part unrefined.

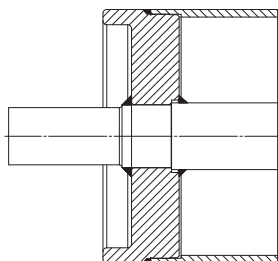
The liaison between the flanges and the shaft could be made in two possible ways : by welding or by tightening with metal circles. In all cases, we use thick flanges which allow us to consider the shaft to fit exactly. In the case of welded liaison we use shafts in E 36-3 or in XC38 with flanges in XC18 in order to reduce the partial soaking risks in thermally affected areas. In the case of metal circle tightening liaisons, the shaft can be produced with steel nuances chosen for their mechanical performances and not for their welding properties.

In the case where geometric tolerances allow, the conception with thick flanges authorize the use of bearings in place of a crossed shaft, which can be very economical in the case of long drums.

► Shaft usage following tolerance plan : possible executions :

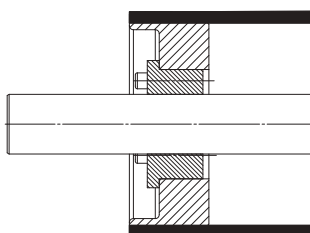
- Retaining walls
- Cotter pin grooves
- Threading
- Drilling, axial or radial tapping

Welded shaft drum



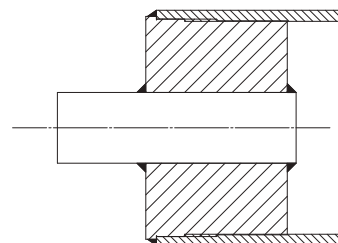
Flanges kept in stock
For tubes 159, 133, 108, 102, 89

Tightened metal circle drum



Metal circles kept in stock
For shaft 30, 40, 50

Bearing drum

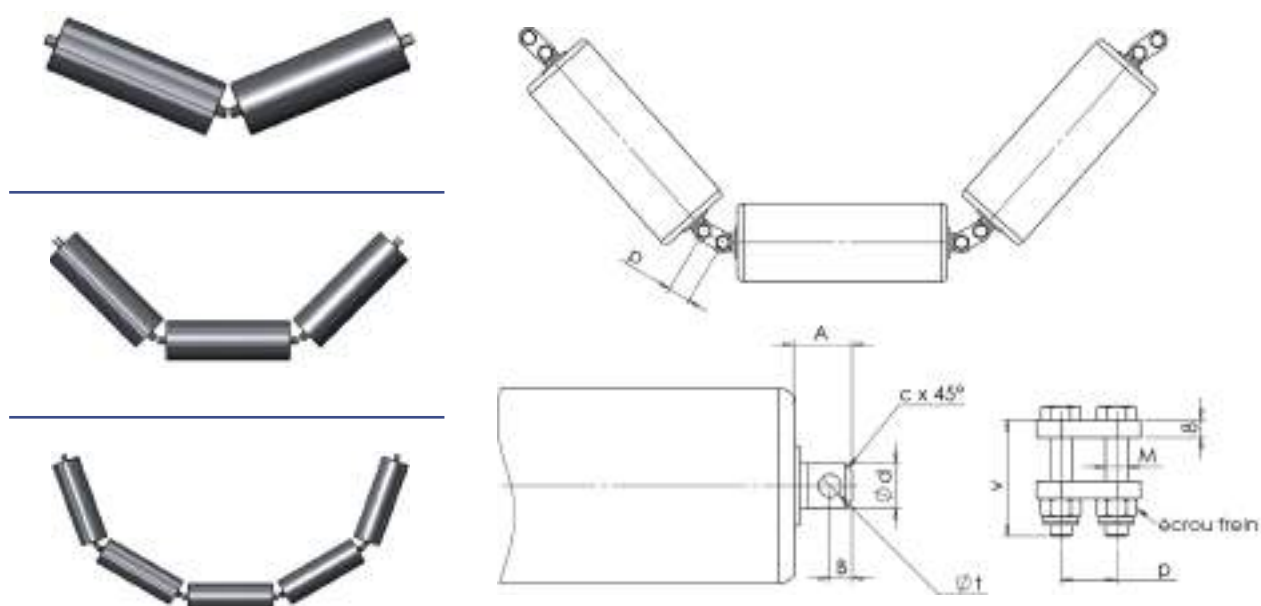


Ends made on demand.
Drums used, for example, for
the conveying of aerial freight
pallets.

Roller

Garland rollers

The garlands are shaped with connected rollers between chain links. They can be composed of 2, 3, or 5 rollers. The garlands with two rollers are used in return belts. The others are used on the superior spindle. Different attached frameworks can be used. A few of these are presented in paragraph D.



► Usage of shaft ends and attachments

Shaft diameter	Tube diameter	Flat nxm	A	B	c	Hole diameter t	chain links pitch p	M	v
20	89		26	10	3x45°	10.5	25.4	M10	53
	108								
	133								
25	89		30	12	4x45°	12.5	31.75	M12	60
	108								
	133								
	159								
30	89	22x32	35	15	5x45°	14.5	38	M14	68
	108								
	133								
	159								
40	108	32x42	Upon special demand/Please contact us						
	133								
	159								
	194								
50	133	40x54							
	159								
	194								

Roller

Garland rollers

► Roller length following NFE 53301

Belt	Advised shaft diameter	V-shaped belt	Trough shaped belt	Trough 5 rlx
400	89	240	150	
500	89	290	190	
650	89 or 108	360	240	
800	89 or 108 or 133	430	290	150
1000	108 or 133 or 159	575	360	190
1200	108 or 133 or 159	675	430	240
1400	133 or 159	725	500	290
1600	133 or 159	875	570	360
1800	159 or 197	975	640	380
2000	159 or 197	1075	710	420

NOTE : Possibility of other dimensions on plans, notably the possibility of using unequal length rollers.

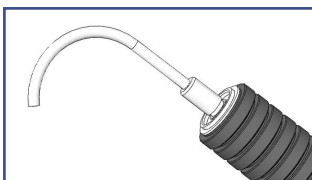
► Fixing garland rollers

The rollers can be supported between them with a simple joint in a vertical plan. However, the end hooks must be tied to the rollers by a double intermediate joint (vertical and horizontal plan).

► Attachment systems

Several systems for supporting the garland are used, and we propose four of these in this catalogue, others can be studied on demand.

By hook



By chain



By universal joint

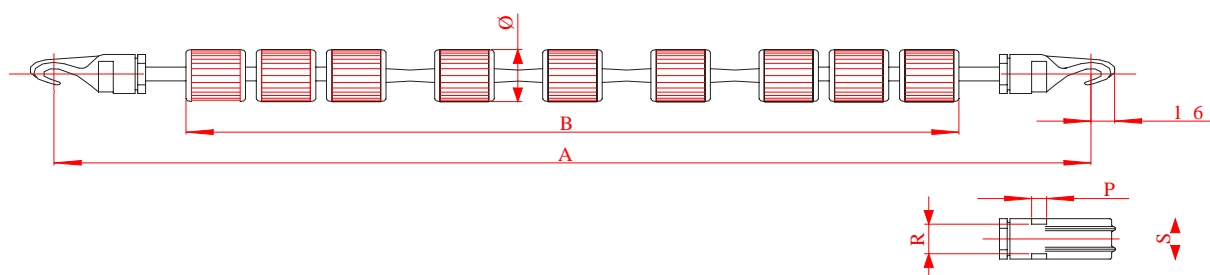


By threaded rods



Roller

Flexible cable garlands



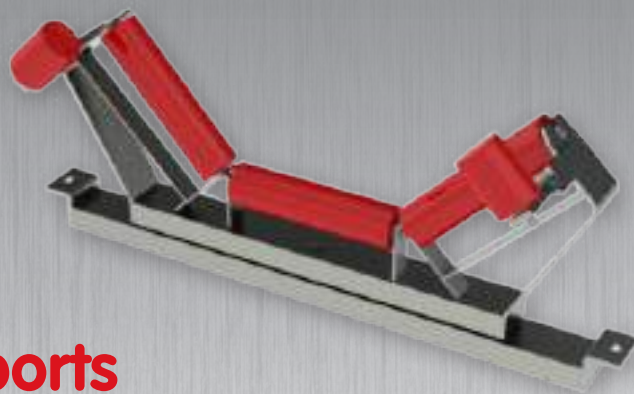
Belt	Diam	A	B	S	P	R	Number of wheels	Mass (kg)
400	76	673	480	57	12	40	7	3.70
500	76	775	580	57	12	40	9	4.40
650	76	925	720	57	12	40	11	4.50
800	76	1081	880	57	12	40	13	5.00
1000	90	1370	1140	57			17	8.60
1200	90	1521	1300	57			19	9.20
1400	90	1680	1450	57			21	9.90

Data susceptible to modification without advance notice

Rubber wheels are over molded on a metallic cable. The attachments are crimped onto the cable. Roller bearings 6204 2RS until an 800 belt, plus roller bearings 6304 2RS + 7304 with oblique contact, protected by a plastic deflector lodged in a cast iron housing in a hooked shape.

Inform us of all usage on:

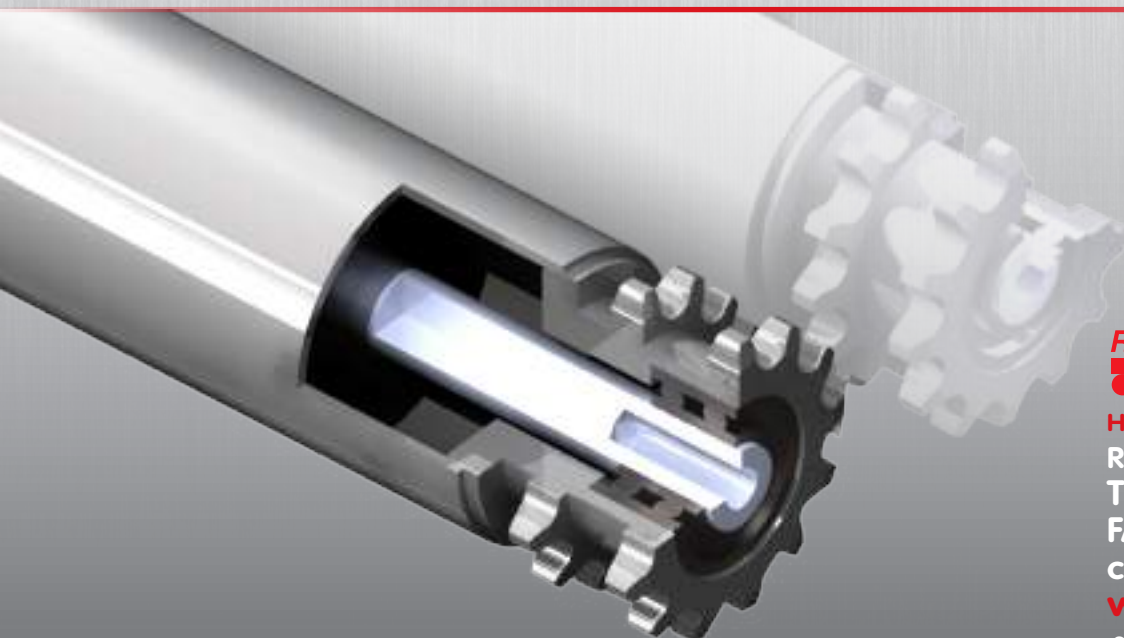
- Sloping conveyors
- Conveyors serving a stacker conveyor or a mobile bucket wheel.



Pack, also for bulk supports



Pack, also for individual load rollers



PRINTED IN FRANCE



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ROULEAUX PACK

GENERAL SALE CONDITIONS

ARTICLE 1 – APPLICATION – OPPOSABILITY OF THE GENERAL SALE CONDITIONS:

Every product order and/or payment made to ROULEAUX PACK carries an unreserved adherence and acceptance by the buyer under the current General Sale Conditions, of which they are already aware. The General Sale Conditions of ROULEAUX PACK prevail over the buyer's general conditions, unless through expressed and written dispensation by ROULEAUX PACK. With the exceptions of particular conditions agreed in writing, the present General Sale Conditions apply to all sales and payments to ROULEAUX PACK regardless of the buyer's nationality, location or delivery site. In particular, the exported materials are in accordance with the International Commercial Terms and the clauses defined in the order receipt. The current General Sale Conditions can also be found on our website at <http://www.rouleaux-pack.fr>.

ARTICLE 2 – PRODUCT PRESENTATION – TERMS AND CONDITIONS:

ROULEAUX PACK'S product information, and in particular to maximum receivable unit loads, is available to the buyer under commercial documents, catalogues, internet sites and all other medias distributed by ROULEAUX PACK and are given for information only. The information, projects and other calculations appearing in these documents do not hold ROULEAUX PACK to a valid contract or commitment. Only the information and recommendations contained in the terms and conditions drawn up in agreement with the buyer, according to the information and needs expressed by the latter, are contractually valid and committed to by ROULEAUX PACK. If the products and materials ordered are to be integrated into an installation complying with a specific standard, it is up to the buyer to inform ROULEAUX PACK.

ARTICLE 3 – COMMERCIAL OFFERS :

Without mentioning otherwise, ROULEAUX PACK's offers are valid for 15 days starting from their issue by ROULEAUX PACK. A non-acceptance by the buyer within this time period and the commercial offer will be declared null and void, unless through expressed or written dispensation by ROULEAUX PACK.

ARTICLE 4 – ORDERS – CREATION OF CONTRACT :

The buyer's orders are considered as accepted until after confirmation by ROULEAUX PACK upon the order receipt. ROULEAUX PACK may, with this order receipt, lay down its own conditions for this order and in particular the conditions of payment within this time period. In the case of discord or disagreement, the comments contained in the order receipt will take precedence over those comments contained in the order. At the time of receiving the order receipt, ROULEAUX PACK reserves the right to demand payment of a deposit that has been pre-agreed whereby, in this assumption, the contract will be completed and the delivery timescale starts to run from the moment the deposit has reached ROULEAUX PACK's account. All non-contested order receipts within a 72 hour working day time period will be considered as accepted in all cases. Every confirmed order is irrevocable and final. This cannot be modified without agreement and ROULEAUX PACK reserves the right to charge a supplementary price, where the buyer will be informed. Furthermore, the order cannot be partially or totally cancelled without the agreement of ROULEAUX PACK. In the case of an order cancellation being accepted by ROULEAUX PACK, the buyer will be obliged to pay ROULEAUX PACK the price for all specially bought supplies, or where the order production has already been underway. In the case of an order cancellation being accepted by ROULEAUX PACK, all paid sums by the buyer to ROULEAUX PACK will be settled. Furthermore, ROULEAUX PACK reserves the right to cancel, suspend or not process the buyer's orders, in cases where a settlement of a previous invoice to ROULEAUX PACK has not been honoured and/or in cases where there has been a failure of these obligations toward ROULEAUX PACK.

ARTICLE 5 – CONDITIONS AND DELIVERY TIMES – MEASURES :

5.1 The delivery times are stated for information only. They will be agreed upon departure of ROULEAUX PACK'S factory. Unless contrary to all information contained in the receipt of acknowledgement, all further delays cannot give rise to deductions or cancellations of the order, nor to damages. ROULEAUX PACK, however, reserves the right, but without its responsibility being compromised, to perform the possibility of a non-delivery or to defer a delivery where the buyer has failed in one or some of the obligations towards ROULEAUX PACK.

5.2 In the case where the client wishes to defer the delivery date of their order in comparison to the contractually agreed date, ROULEAUX PACK reserves the right to invoice them for storage costs.

ARTICLE 6 – FORCE MAJEURE :

All commitments made by ROULEAUX PACK can be suspended in the case of a force majeure where the company cannot commit its responsibility. Of particular mention, in accordance with the parties concerned, a force majeure includes : fires, floods, riots, attacks, material damage, war, strikes (total or partial), lock-outs in ROULEAUX PACK'S factories or their suppliers' factories, subcontractors or transporters/carriers. In these particular cases, the delivery will be prolonged by one month. By exceeding this time limit, each of the parties concerned can cancel the late order without the possibility of seeking a grant for damages.

ARTICLE 7 – TRANSPORT – RISK TRANSFER – REPRESENTATION COSTS :

7.1 Transportation is carried out as agreed and mentioned in the receipt of acknowledgement. In the case of a precision defect, the products will be checked in accordance with the International Commercial Terms EXW. Transportation is carried out under the buyer's responsibility and the risk transfers operate as soon as the merchandise is taken from ROULEAUX

PACK'S premises by the transporter.

7.2 In the case where ROULEAUX PACK makes its own transportation, the **risk transfers will operate from the moment the products are delivered** to the buyer's premises by the transporter. In all cases, it is up to the buyer to be insured for all transport or unloading risks and, in the case of delays, damages or losses during transportation of all stocks and to exercise all appeals by recorded delivery or by a bailiff within a maximum delay of 3 days to the transporter responsible for the delivery.

7.3 Unless otherwise stated by the buyer, their offices will be considered as open from Monday to Friday, except for national holidays, for every month of the year. The buyer is obliged to tell ROULEAUX PACK of any closure dates or the dates of annual holidays. For defaults, in the case where the delivery of products has been rendered impossible by the closure of the buyers' offices, the transportation costs will be the object of an additional invoice.

ARTICLE 8 – CONTRACTUAL GUARANTEE OF DELIVERED PRODUCTS :

Except for a particular contract, products delivered by ROULEAUX PACK, which are worn out pieces, are guaranteed for a ONE-YEAR period starting from the delivery period. Products declared as non-conforming or defective by the buyer must be returned by the cost of the latter to ROULEAUX PACK. If the defective rollers are not returned by the buyer, the replacement rollers and pieces will be charged by ROULEAUX PACK to the buyer. By way of the guarantee and if the returned pieces are found to be defective by the technical services, ROULEAUX PACK will commit themselves to replace the delivered pieces to the place of delivery mentioned in the receipt of acknowledgement. If the rollers, subject of the guarantee claim and after having been returned to ROULEAUX PACK, are not found to be non-conforming or defective or not covered by the guarantee contract, they will be charged to the buyer. ROULEAUX PACK will not be held responsible for material defects under normal working conditions, from incorrect mounting, from uses not conforming to technical specifications, from servicing defaults and/or supervision. ROULEAUX PACK also rejects all responsibility in cases of product modification by the buyer, which has not been validated in writing by ROULEAUX PACK, as well as in the case of intervention by third parties, not certified by ROULEAUX PACK, upon the material. Likewise, ROULEAUX PACK will not be held responsible for defaults coming from product conception when they have been carried out according to the buyers plans and studies. ROULEAUX PACK will also not be held responsible for the choice of products and materials made by the buyer. In the case of the buyer demanding the right of the guarantee contract, if this guarantee is upheld in the buyers favour, the replacement roller guarantee will be extended for a period which will pass between the guarantee reimbursement and the replacement date.

ARTICLE 9 – COMPLAINTS – BUYER COMPENSATION :

9.1 In the case of apparent defaults or product non-conformity in comparison with ROULEAUX PACK's receipt of acknowledgement or terms and conditions agreed between the parties, and without prejudice toward the transporter of arrangements taken, the buyer is held, under the penalty of debarment, to contact ROULEAUX PACK by recorded delivery with the receipt of acknowledgement within 15 days of receipt. Within this time, the buyer cannot make any other complaints or disputes against ROULEAUX PACK relating to products and/or deliveries.

9.2 In the case of complaint, it belongs to the buyer to supply all truthful justification and of particular importance to damage, missing pieces, and defaults or of visual non-conformities. The buyer must return the delivered products in cases of impossibility and to have them available for ROULEAUX PACK to take all possible measures to keep the products in the condition in which they received them. In the case of missing items, ROULEAUX PACK is obliged to supply complementary pieces to the buyer. It is specific that all non-conforming pieces or flawed pieces close to errors or loopholes in the terms and conditions will be the responsibility of the buyer.

9.3 The buyer is forbidden to intervene themselves or to appoint a third-party to intervene to repair damages, defaults or non-conforming pieces without the agreement of ROULEAUX PACK. In the case of ROULEAUX PACK's agreement to these reparations and the estimated timescale for these, ROULEAUX PACK will be obliged to pay the costs of this based on an hourly rate equal to two times the minimum wage's gross salary.

ARTICLE 10 : LIMITED RESPONSIBILITY :

In cases of apparent defects, non-conforming pieces or hidden defects attributed to ROULEAUX PACK, they are obliged, through their choice, to :
- replace the pieces and have them redelivered to the address mentioned in the order or the acknowledgement receipt.
- reimburse the buyer.

This is with the exception of all damages and interests for losses subjected to the buyer for the reasons of missing pieces, apparent defects or non-conformity, which have been affected by nature (physical, intangible, material or immaterial, direct or indirect).

ARTICLE 11 – INVOICING - PRICE :

All non-contested invoices within a seven-day time period of reception are to be treated as accepted by the buyer, without reservation, as in their quantum, and in their payment methods. The invoice prices are expressed in euros and are without tax. All taxes, tax rights or other payments in accordance with French rules and regulations or of those of the importers country of origin or transits are charged to the buyer. Unless otherwise agreed, the transportation costs and customs duty are charged to the buyer. Unless otherwise indicated, the land packaging costs are included

in the price and sea or air packaging costs will be subject to a separate additional charge.

ARTICLE 12 - PAYMENT CONDITIONS :

The payment conditions are subject to an agreement between ROULEAUX PACK and the buyer. The invoices are payable to the Head Office of ROULEAUX PACK – BP 17 – 42130 BOEN (France) Whatever the banking process for payment, the invoices are to be paid within 30 days or until the 10th day of the following month, unless otherwise specifically stipulated in the receipt of acknowledgement. In cases of draft payments, these must be returned to ROULEAUX PACK 30 days before the settlement date. Payments constitute not only a simple commercial handover or a cheque implying an obligation to pay, but also a payment made before the agreed settlement date. A discount of 0.3% per month is granted for early invoiced payments not including taxes, and therefore the tax payment will be modified accordingly. ROULEAUX PACK reserves the possibility to reclaim from the buyer an account or payment made before fulfillment of an order or before expedition, if the buyer continues to have an ongoing debt with ROUEAUX PACK or where insolvency risks are high (for example in cases where there is an insufficient guarantee given by ROULEAUX PACK's credit insurance. These rules are independent from the regulations stated in the order receipt. Furthermore, the buyer cannot suspend their payments nor make any compensation claims without a prior agreement in writing to ROULEAUX PACK.

ARTICLE 13 - LATE OR DEFAULTED PAYMENTS - COMPENSATION :

All late payments will give rise to, after prior notice, in accordance to law 2008-776 of 4th August 2008, a penalty calculated by applying the sum due with an interest tax equal to three times that of the legal interest tax in force on the non-honoured payment date, as well as an inclusive indemnity for collection costs of 40 Euros (Decree 2012-1115 of 02/10/2012). The interests will begin to run from the payment date shown on the invoice until the total payments including interests have been paid to ROULEAUX PACK. Each month started is fully due. All late invoice payments with regard to their settlement dates will lead to immediate payability of all invoices currently under suspension by ROULEAUX PACK without prejudice to any other courses of action. Likewise, all late payments in relation to the contractual dates will lead to the irrevocable loss of the conventional guarantee on the delivered products. Moreover, full rights compensation will be made between the sums owed to ROULEAUX PACK and the sums owed by the buyer, the same for the absence of a connection between the two claims, under certain rights according to each one, both cash and debts.

ARTICLE 14 - OWNERSHIP RIGHTS :

ROULEAUX PACK remains the owner of products and materials sold and supplied until payment has been made in full for main components and accessories. In light of the present clause, payment only takes effect when ROULEAUX PACK has collected the monies, and not simply by a bill of exchange or by all other means created as an obligation to payment. Notwithstanding the ownership rights present clause, all risks pertaining to products and materials sold and supplied will be charged to the client starting from their delivery. The client is committed to therefore take care of all carriage and stocking of materials and to subscribe under the appropriate insurances. If the material objects under the ownership rights become sold by the client, ROULEAUX PACK's debt will immediately and automatically be transferred onto the price of the material resold by the client. In cases of total or partial non-payment claims, the materials in stock will be considered as unpaid debts. All previously paid accounts will remain acquired by ROULEAUX PACK under the Civil Liability clause. ROULEAUX PACK is from now on authorised under the client's acceptance, to complete an inventory and/or to impound the unpaid products held by them. The client is obliged to inform all third-parties, particularly in the case of seizure, of all merchandise under ownership rights belonging to ROULEAUX PACK, and to immediately inform ROULEAUX PACK of all seizures or similar operations.

ARTICLE 15 - APPLICABLE LANGUAGE :

The applicable language in all commercial relationships between ROULEAUX PACK and the client is French. If for some reason the current General Conditions as well as all contractual documents, catalogues, technical files..... and more generally all document emanating from ROULEAUX PACK are to be translated into another language, the French version will serve as proof in all cases of doubt.

ARTICLE 16 - APPLICABLE RIGHTS :

All lawsuits to occur between ROULEAUX PACK and the buyer will be subjugated under French law. In the case of International merchandise sales, the United Nations Convention of the 11th of April 1980 (the Vienna Convention) is inapplicable.

ARTICLE 17 - INVALIDITY :

The invalidity of one or more of ROULEAUX PACK's current General Sale Conditions agreements will not lead to the invalidity of all the General Sale Conditions.

ARTICLE 18 - JURISDICTION AWARDING :

All lawsuits between ROULEAUX PACK and the buyer come under the sole competence of the Commercial Tribunal of SAINT ETIENNE (Loire – France), equally in the case of special hearings, guaranteed appeals or the defendant's plurality.