

# Conveyor components Shaftless drum



Conveyor  
Components



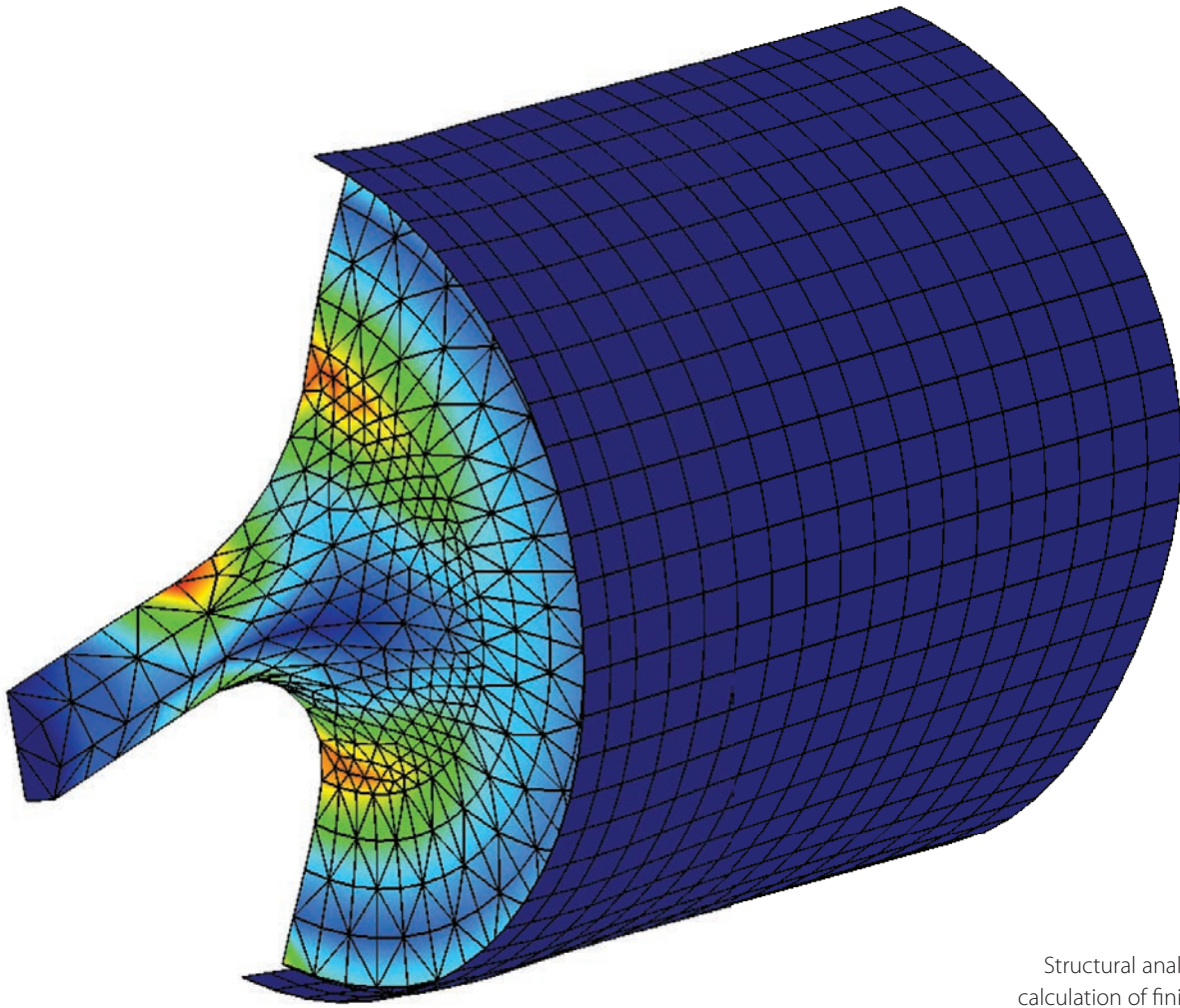




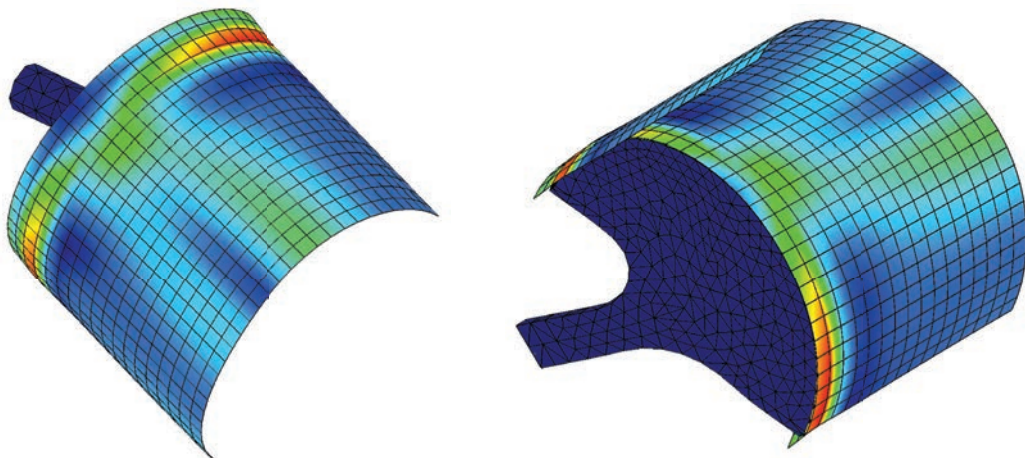
The operational safety of a belt conveyor system is the sum of the reliability of the components used.

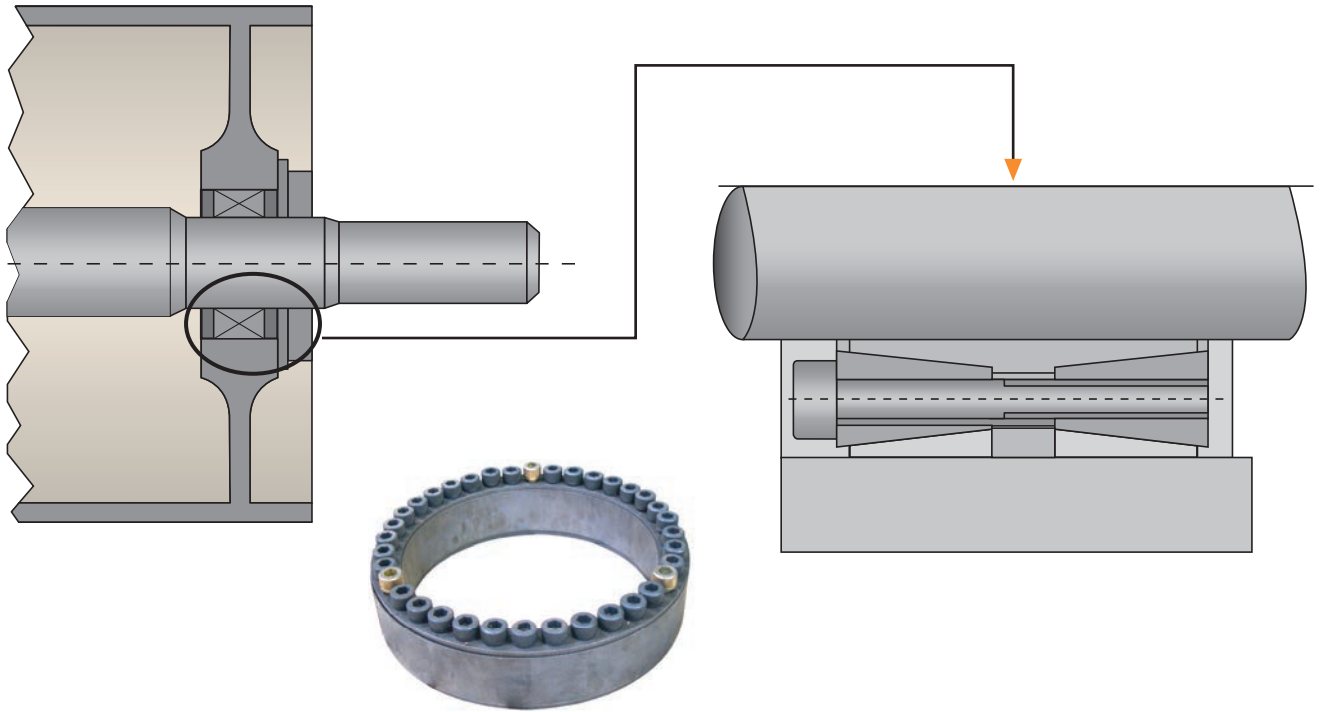


# Shaftless Drum



Structural analyses based on the calculation of finite elements (FEA).





## Product presentation

### Conventional project

The most common failures usually occur on the sides of the drums. Considering the high probability of these events, a standard project was developed consisting of a drum attached to a shaft by means of a disassembly and quick replacement device, as shown in the example in the drawing below.

The drum is attached to a rigid shaft by an expansive element called ringfeder.

The arrangement provides a good torque transmission capacity, but its capability to accept the bending moment (in general, 30% of the torque capacity) is limited. It is necessary to apply a high initial pre-load on the ringfeder to generate the frictional force required.

As a result, it became an element or cause of failures, although the expansive attachment made the drum removal easier.

In order to improve this condition, the shaft diameter was incremented to increase its rigidity and to optimize the shape of the side discs to make them flexible, decreasing the bending moment transmitted by the drum disc to the ringfeder. In addition,

ringfedeers with expanded width were developed with a higher torque capacity; however, all these measures resulted in a significant cost increase and did not eliminate definitively the failure cause.

### Final solution - Shaftless drum

The ultimate solution for the mechanical problems of the conventional projects was achieved with the recent development of the new shaftless drum.

The elaborate arrangement consists of a single unit composed of sides with protruding shaft ends attached to the main body.

The total absence of weak attaching points eliminates the possibility of structural failure.

Although innovative in the field of conveyor belts, the new project has been largely used in other applications such as winch drums and ball mills.

### Project

The project was developed using a computerized calculation method of finite elements and confirmed by measurements of field voltages with a strain gauge.

The safety factors adopted in sizing always predict fatigue, ensuring unlimited life to the product.



Shaftless pulley for heavy-duty application in installation.

## Features and benefits

### Features and benefits

Cast alloy steel side covers incorporate the shaft ends for support on the bearing. The welded joint of the calendered body with the side covers was carefully studied.

### Manufacture

The covers are cast in alloy steel, pre-machined and tested by means of ultrasound, penetrating liquid and magnetic particles.

Certified calendered steel body and covers welded through an automatic submerged arc process.

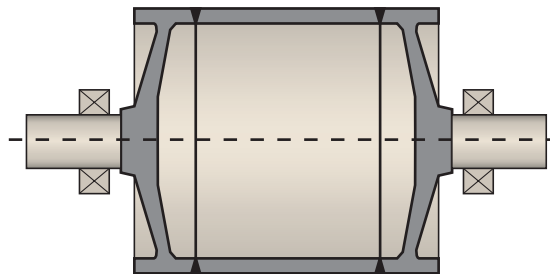
The final machining of the assembly ensures perfect alignment and centering.

### Available series

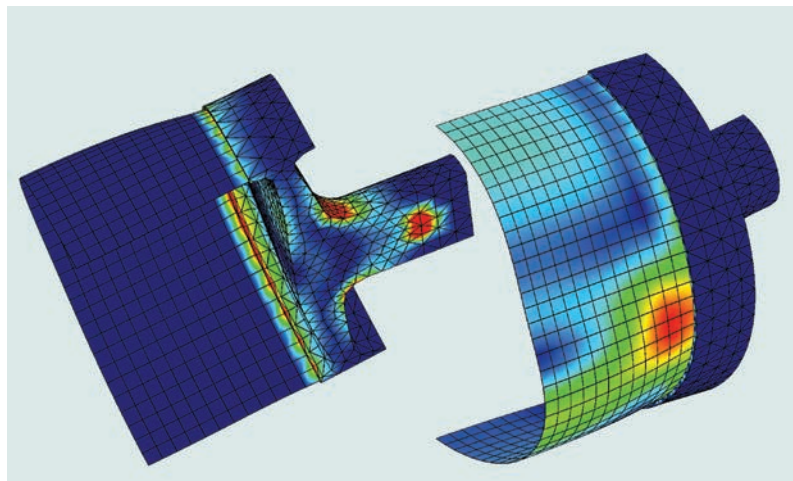
Drum dimensions are determined by the buyer according to the installation requirements.

The basic dimensions can be manufactured to meet 24" and 96" conveyors, with a load range of 1 to 280 tons, as shown on the tables on the following pages.

The following tables indicate the basic dimensions, weights and permissible loads for the shaftless drum series.



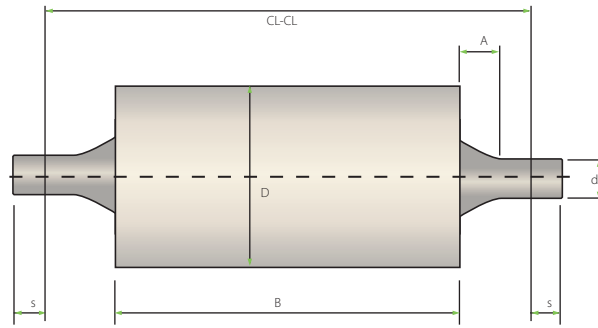
Shaftless Pulley - typical project.



Shaftless pulley structural analysis for heavy-duty application.

## Technical specifications

# Shaftless drums for light applications



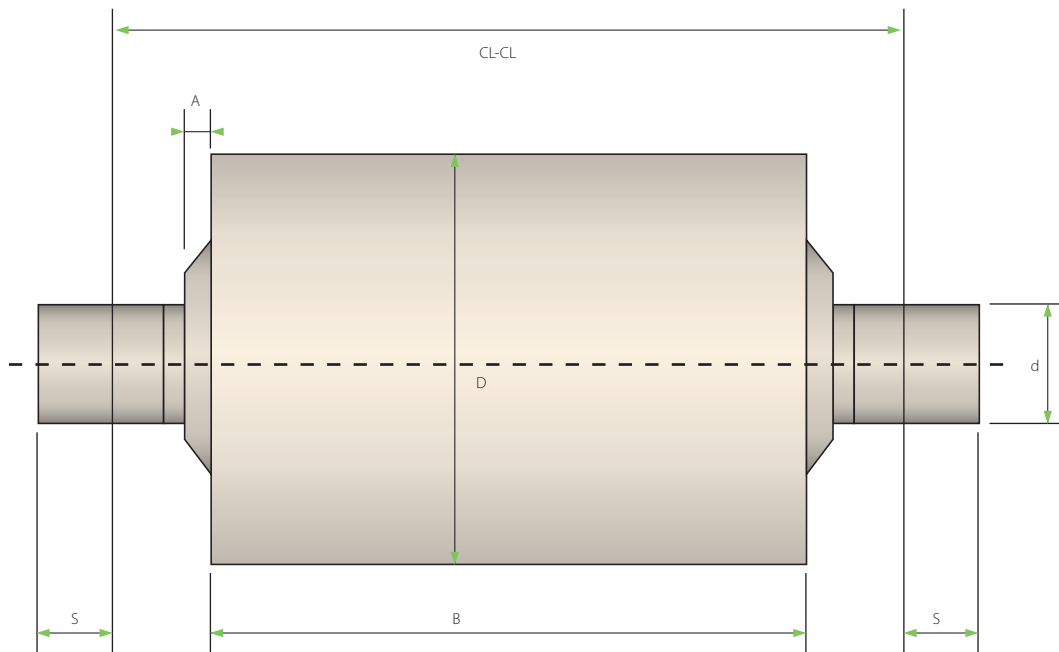
Capacity F kgf	Pulley weight based on belt dimension (kg)													
	24°			30°				36°			42°			
	250	320	400	250	320	400	500	320	400	500	320	400	500	630
1000	71	96		84	108	-	-	104				115		
2000	-	124	165	-	139	190	255	129	169	233	125	188	264	
4000	-	-	190	-	-	253	333		242	338		278	370	593
6000	-	-	-	-	-	-	384		270	410		318	414	
8000	-	-	-	-	-	-	-							689

Belt width	kgf.	D (mm)	B (mm)	CL-CL	d (mm)	S (mm)	A (mm)	
24°	1000	250	710	1200	60	36	165	
		320	710	1200	60	36	165	
	2000	320	710	1200	60	36	165	
		400	710	1200	75	44	145	
4000	400	710	1200	90	54	130		
30°	1000	250	900	1350	60	36	145	
		320	900	1350	60	36	145	
	2000	320	900	1350	75	44	125	
		400	900	1350	75	44	125	
	4000	400	900	1350	90	54	110	
		500	900	1350	90	54	110	
	6000	400	900	1350	100	58	105	
		500	900	1350	100	58	105	
36°	1000	320	1020	1430	60	36	125	
		320	1020	1430	75	44	105	
	2000	400	1020	1430	75	44	105	
		500	1020	1430	75	44	105	
	4000	400	1020	1430	100	58	85	
		500	1020	1430	100	58	85	
	6000	400	1020	1430	110	60	78	
		500	1020	1430	110	60	78	
	42°	1000	320	1170	1650	75	44	140
			320	1170	1650	75	44	140
2000		400	1170	1650	75	44	140	
		500	1170	1650	75	44	140	
4000		400	1170	1650	100	58	120	
		500	1170	1650	100	58	120	
6000		630	1170	1650	100	58	120	
		400	1170	16.50	110	60	110	
8000		500	1170	1650	110	60	110	
		630	1170	1650	120	68	90	



Technical specifications

# Shaftless drums for heavy-duty applications



Capacity P Ton.	D (mm)	d (mm)	S (mm)	A (mm)	Pulley weight based on belt dimension (kg)					
					42"	48"	54"	60"	72"	84"
					B=1170 CL-CL=1870	B=1370 CL-CL=2070	B=1530 CL-CL=2230	B=1680 CL-CL=2380	B=1990 CL-CL=2690	B=2290 CL-CL=2990
40	630	180	96	130	943	1058	1130	1165	1272	1376
	800	180	96	130	1255	1330	1390	1446	1673	1804
63	800	240	118	90	1650	1750	1830	1905	2284	2472
	1000	240	118	90	2030	2139	2227	2309	2615	2803
100	1000	300	144	50	2708	2865	2990	3108	3351	3586
	1250	300	144	50	3409	3605	3762	3909	4213	4507
160	1250	360	174	10	3730	3828	3906	3979	4291	4467
	1500	360	174	10	4652	4769	4862	4950	5131	5306
250	1500	500	250	65	7607	7837	8020	8192	8548	8892
	1800	500	250	65	8904	8904	9124	9331	9757	10170



## Expect results

Expect results is our promise to our customers and the essence of our strategy. It is the attitude we share globally. Our business is to deliver results to our customers to help them reach their goals.

