

# PRODUCT DESCRIPTION

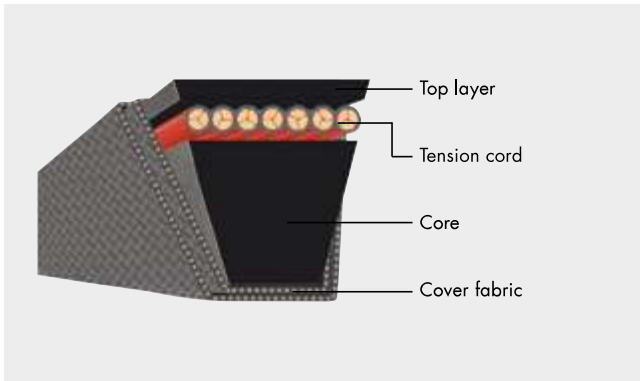
## optibelt SK HIGH PERFORMANCE WEDGE BELTS

### DIN 7753 PART 1 / ISO 4184



#### Structure

optibelt SK high performance wedge belts consist of:



The polyester tension cord is standard for all profiles and cross sections, with cord constructions matching the requirements of each profile. The cord is specially impregnated and then embedded in a special rubber compound homogeneously bonding with the top layer and the core.

Due to special processing, the optibelt SK wedge belt is extremely low-stretch. Thus we were able to reduce our recommendation values for minimum axial distance significantly – even dropping below the DIN/ISO requirements. The fabric cover is treated with a wear-resistant rubber compound. This makes the belt resistant to oil, hot and cold temperatures and to the effects of dust.

#### Properties

The use of the best materials and the most advanced production methods result in this high performance drive element, the optibelt SK wedge belt. The production processes are continuously monitored using state-of-the-art static and dynamic testing devices.

optibelt SK high power wedge belts exceed classic V-belts according to DIN 2215 thanks to the following characteristics:

- Substantially lower width compared to classic V-belt drives that have the same power rating (height to width ratio of approximately 1 : 1.2). Due to the available space gained by this, the costs for a complete drive with optibelt SK high performance wedge belts are lower than a design with DIN 2215 V-belts.
- Bigger friction surface lowers the centrifugal force and permits belt speeds of up to 42 m/sec.
- Much more elastic, therefore bigger flex rate allowed.
- Little deformation of the belt cross-section when running in grooves, therefore balanced pressure on the belt edges.

These characteristics allow for a significantly better performance than V-belts DIN 2212 with approximately the same top widths. Therefore, we recommend equipping all new drives with optibelt SK wedge belts.

#### Application areas

optibelt SK wedge belts in the profiles SPZ, SPA, SPB and SPC were specially developed for all industrial applications from lightly loaded drives, such as those for pumps, up to heavily loaded mills and even stone crusher drives.

#### Standardisation/Dimensions

optibelt SK wedge belts SPZ, SPA, SPB and SPC comply with the standards of DIN 7753 and ISO 4184.

The ISO standards specify the datum width as a basis for the standardisation of V-belts and grooves.

The staggering of the datum lengths is implemented according to DIN 7753 Part 1 corresponding to the standard number sequence R 40. In exceptional cases also corresponding to standard number sequence R 20.

For many years, our product range has comprised serial production datum lengths of standard number sequence R 40 and beyond.

**Note:** Electrically conductive according to ISO 1813.

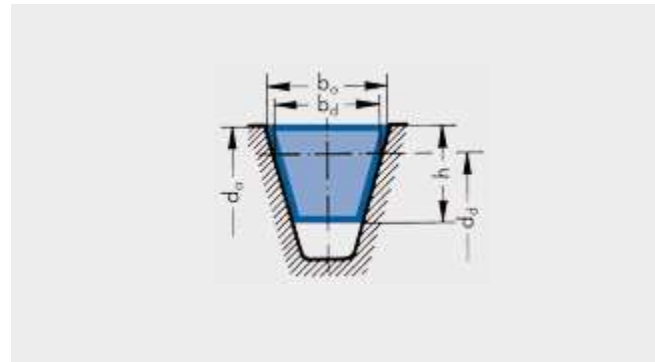


Table 5

Profile		SPZ	SPA	SPB	SPC
Belt top width	$b_o \approx$	9.7	12.7	16.3	22
Datum width	$b_d \approx$	8.5	11	14	19
Belt height	$h \approx$	8	10	13	18
Recommended minimum datum pulley diameter	$d_{dmin}$	63	90	140	224
Weight per meter (kg/m)	$\approx$	0.074	0.123	0.195	0.377
Flex rate ( $s^{-1}$ )	$f_{Bmax} \approx$		100		
Belt speed (m/s)	$v_{max} \approx$		42*		

\* $v > 42$  m/s. Please consult our Application Engineering Department.

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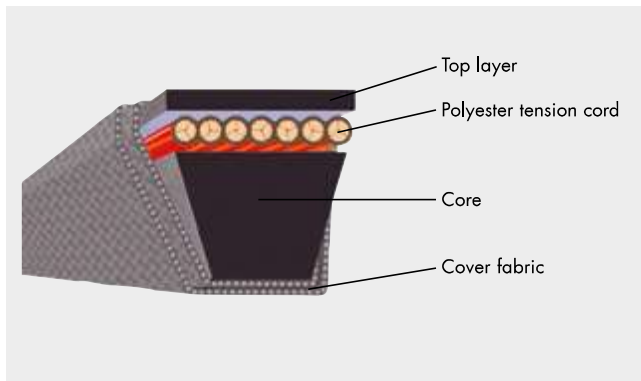
## optibelt SK HIGH PERFORMANCE WEDGE BELTS

### ARPM/MPTA



#### Structure/Properties

optibelt SK high performance wedge belts according to ARPM/MPTA have the same structure and properties as wedge belts according to DIN 7753 Part 1.



#### Standardisation/Dimensions

The three wedge belt profiles standardised in the USA are 3V/9N, 5V/15N and 8V/25N. The cross section dimensions of these belts and the according length only partially conform to the profiles and lengths of the wedge belts DIN 7753 Part 1.

The profile 3V/9N roughly corresponds to SPZ; and 5V/15N to profile SPB. There is no comparable DIN/ISO wedge belt profile for 8V/25N. It is possible to use belts in profile 3V/9N and 5V/15N in SPZ-Z/10 or SPB-B/17 pulleys, respectively; but the use of SPZ or SPB belts in ARPM/MPTA standard pulleys is not generally recommended. The top width of the American pulley grooves is smaller than that of the corresponding DIN/ ISO pulleys. This can cause wear on the upper edges of SPZ and SPB belts and can lead to premature failure.

Due to its cross section, the optibelt SK wedge belt in SPB profile is also suitable for 5V/15N pulleys.

**Note:** Electrically conductive according to ISO 1813.

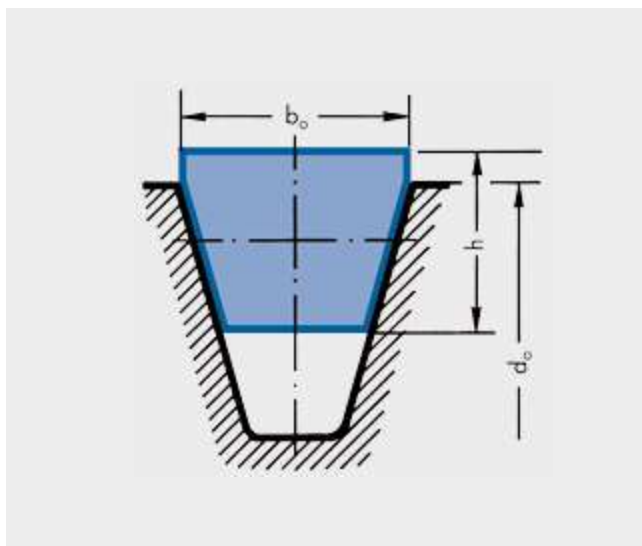


Table 6

Profile		3V/9N	5V/15N	8V/25N
Belt top width	$b_o \approx$	9	15	25
Belt height	$h \approx$	8	13	23
Recommended minimum pulley outside diameter	$d_{a\min}$	67	151	315
Belt weight (kg/m)	$\approx$	0.074	0.195	0.575
Flex rate ( $s^{-1}$ )	$f_{B\max} \approx$	100		
Belt speed (m/s)	$v_{\max} \approx$	55*		

\* $v > 55$  m/s. Please contact our Application Engineering Department.

The belt length designation refers to the effective outside length.

Example:

Inch designation	Metric designation
3V 750	9N 1905
3V = profile 3/8" top width	9 $\approx$ 9 mm top width
750 = outside length in inches: 10 (1 inch = 25.4 mm)	N = designation for single V-belt
Outside length in mm:	1905 = effective outside length
$L_a = \frac{750 \cdot 25.4}{10}$	
$L_a = 1905$ mm	

#### Application examples

The use of optibelt SK wedge belt drives in profiles 3V/9N and 5V/15N is recommended for machines exported to countries such as the USA and Canada where these belt profiles are standardised and predominantly used. Profile 8V/25N is primarily employed in very heavy duty drives such as mills or stone crushers. As these wedge belts transmit very high levels of power, they can sometimes form a more compact drive than the SPC profile.

For this reason, the 8V/25N profile has continued to be used in Europe for such applications. A further advantage is the fact that single wedge belts can be replaced by kraftbands, without changing the pulley geometry, in case unexpected belt vibration problems develop.

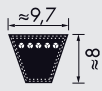
#### Drive calculation

Drive calculations follow the procedures described in this manual. The power value of the SPZ applies for drives with the 3V/9N profile. The value of the SPB profile applies for 5V/15N. The datum diameters of the SPZ and SPB wedge belts have to be the same as the external diameters of the 3V/9N and 5V/15N. Slight mathematical differences in the rotational frequency and transmission have no practical influence. Slight differences in the theoretical drive speed and the speed ratio are not significant in practice.

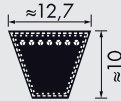
# STANDARD RANGE

## optibelt **SK** HIGH PERFORMANCE WEDGE BELTS

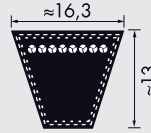
### DIN 7753 PART 1 / ISO 4184



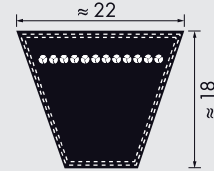
**SPZ**



**SPA**



**SPB**



**SPC**

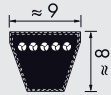
Profile SPZ			Profile SPA				Profile SPB		Profile SPC
Datum length ISO $L_d$ [mm]			Datum length ISO $L_d$ [mm]				Datum length ISO $L_d$ [mm]		Datum length ISO $L_d$ [mm]
487	1047	<b>1662</b>	732	<b>1382</b>	<b>2120</b>	<b>3350</b>	<b>1250</b>	<b>3650</b>	<b>2000</b>
512	1060	<b>1687</b>	757	<b>1400</b>	<b>2132</b>	<b>3382</b>	<b>1320</b>	<b>3750</b>	<b>2120</b>
562	1077	<b>1700</b>	782	<b>1407</b>	<b>2182</b>	<b>3550</b>	<b>1400</b>	<b>3800•</b>	<b>2240</b>
587	1087	<b>1737</b>	800	<b>1432</b>	<b>2207</b>	<b>3750</b>	<b>1450</b>	<b>4000</b>	<b>2360</b>
612	1112	<b>1762</b>	807	<b>1457</b>	<b>2232</b>	<b>4000</b>	<b>1500</b>	<b>4050•</b>	<b>2500</b>
630	1120	<b>1787</b>	832	<b>1482</b>	<b>2240</b>	<b>4250</b>	<b>1600</b>	<b>4250</b>	<b>2650</b>
637	1137	<b>1800</b>	850	<b>1500</b>	<b>2282</b>	<b>4500</b>	<b>1700</b>	<b>4300•</b>	<b>2800</b>
662	<b>1162</b>	<b>1812</b>	857	<b>1507</b>	<b>2300</b>		<b>1750</b>	<b>4500</b>	<b>3000</b>
670	<b>1180</b>	<b>1837</b>	882	<b>1532</b>	<b>2307</b>		<b>1800</b>	<b>4560•</b>	<b>3150</b>
687	<b>1187</b>	<b>1850</b>	900	<b>1557</b>	<b>2332</b>		<b>1850</b>	<b>4750</b>	<b>3350</b>
710	<b>1202</b>	<b>1862</b>	907	<b>1582</b>	<b>2360</b>		<b>1900</b>	<b>4820•</b>	<b>3550</b>
722	<b>1212</b>	<b>1887</b>	932	<b>1600</b>	<b>2382</b>		<b>2000</b>	<b>5000</b>	<b>3750</b>
737	<b>1237</b>	<b>1900</b>	950	<b>1607</b>	<b>2432</b>		<b>2020•</b>	<b>5070•</b>	<b>4000</b>
750	<b>1250</b>	<b>1937</b>	957	<b>1632</b>	<b>2482</b>		<b>2060</b>	<b>5300</b>	<b>4250</b>
762	<b>1262</b>	<b>1987</b>	982	<b>1657</b>	<b>2500</b>		<b>2120</b>	<b>5600</b>	<b>4500</b>
772	<b>1287</b>	<b>2000</b>	1000	<b>1682</b>	<b>2532</b>		<b>2150•</b>	<b>6000</b>	<b>4750</b>
787	<b>1312</b>	<b>2037</b>	1007	<b>1700</b>	<b>2582</b>		<b>2180</b>	<b>6300</b>	<b>5000</b>
800	<b>1320</b>	<b>2120</b>	1032	<b>1707</b>	<b>2607</b>		<b>2240</b>	<b>6700</b>	<b>5300</b>
812	<b>1337</b>	<b>2137</b>	1060	<b>1732</b>	<b>2632</b>		<b>2280•</b>	<b>7100</b>	<b>5600</b>
825	<b>1347</b>	<b>2150•</b>	1082	<b>1757</b>	<b>2650</b>		<b>2360</b>	<b>7500</b>	<b>6000</b>
837	<b>1362</b>	<b>2187</b>	1107	<b>1782</b>	<b>2682</b>		<b>2391</b>	<b>8000</b>	<b>6300</b>
850	<b>1387</b>	<b>2240</b>	1120	<b>1800</b>	<b>2732</b>		<b>2400•</b>		<b>6700</b>
862	<b>1400</b>	<b>2287</b>	1132	<b>1807</b>	<b>2782</b>		<b>2500</b>		<b>7100</b>
875	<b>1412</b>	<b>2360</b>	1157	<b>1832</b>	<b>2800</b>		<b>2650</b>		<b>7500</b>
887	<b>1437</b>	<b>2500</b>	1180	<b>1857</b>	<b>2832</b>		<b>2680•</b>		<b>8000</b>
900	<b>1462</b>	<b>2540•</b>	1207	<b>1882</b>	<b>2847</b>		<b>2800</b>		<b>8500</b>
912	<b>1487</b>	<b>2650</b>	1232	<b>1900</b>	<b>2882</b>		<b>2840•</b>		<b>9000</b>
925	<b>1500</b>	<b>2690•</b>	1250	<b>1907</b>	<b>2932</b>		<b>2850</b>		<b>9500</b>
937	<b>1512</b>	<b>2800</b>	1257	<b>1932</b>	<b>2982</b>		<b>2900</b>		<b>10000</b>
950	<b>1537</b>	<b>2840•</b>	1272	<b>1957</b>	<b>3000</b>		<b>3000</b>		<b>10600</b>
962	<b>1562</b>	<b>3000</b>	1282	<b>1982</b>	<b>3032</b>		<b>3150</b>		<b>11200</b>
987	<b>1587</b>	<b>3150</b>	1307	<b>2000</b>	<b>3082</b>		<b>3250</b>		<b>12500</b>
1000	<b>1600</b>	<b>3350</b>	1320	<b>2032</b>	<b>3150</b>		<b>3350</b>		
1012	<b>1612</b>	<b>3550</b>	1332	<b>2057</b>	<b>3182</b>		<b>3450</b>		
1024	<b>1637</b>		1357	<b>2082</b>	<b>3282</b>		<b>3550</b>		
1037	<b>1650</b>								
Maximum production length: 4500 mm $L_d$ Minimum order quantity: Over 1800 mm = 20 pieces for non-standard length ranges 60 pieces for special constructions Weight: $\approx 0.074$ kg/m			Maximum production length: 4500 mm $L_d$ Minimum order quantity: Over 1800 mm = 31 pieces for non-standard length ranges 93 pieces for special constructions Weight: $\approx 0.123$ kg/m				Maximum production length: 18000 mm $L_d$ Minimum order quantity: Over 1800 mm = 25 pieces for non-standard length ranges 75 pieces for special constructions Weight: $\approx 0.195$ kg/m		Maximum production length: 21000 mm $L_d$ Minimum order quantity: Over 2000 mm = 16 pieces for non-standard length ranges 48 pieces for special constructions Weight: $\approx 0.377$ kg/m
Datum length $L_d \triangleq$ Pitch length $L_w/L_p$			• Non stock items						

Lengths in **bold** type are in S=C Plus (SetConstant).

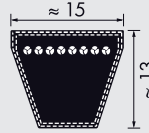
# STANDARD RANGE

## optibelt **SK** HIGH PERFORMANCE WEDGE BELTS

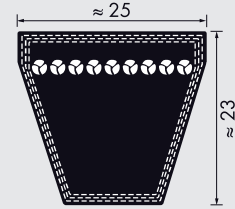
### ARPM/MPTA



**3V/9N**



**5V/15N**



**8V/25N**

Profile 3V/9N		Profile 5V/15N		Profile 8V/25N	
Belt designation		Belt designation		Belt designation	
Profile, length code	Profile, outside length, L <sub>a</sub> [mm]	Profile, length code	Profile, outside length, L <sub>a</sub> [mm]	Profile, length code	Profile, outside length, L <sub>a</sub> [mm]
3V 250	9N 635	5V 530	15N 1346	8V 1000	25N 2540
3V 265	9N 673	5V 560	15N 1422	8V 1120	25N 2845
3V 280	9N 711	5V 600	15N 1524	8V 1180	25N 2997
3V 300	9N 762	5V 630	15N 1600	8V 1250	25N 3175
3V 315	9N 800	5V 670	15N 1702	8V 1320	25N 3353
3V 335	9N 851	5V 710	15N 1803	8V 1400	25N 3556
3V 355	9N 902	5V 750	15N 1905	8V 1500	25N 3810
3V 375	9N 952	5V 800	15N 2032	8V 1600	25N 4064
3V 400	9N 1016	5V 850	15N 2159	8V 1700	25N 4318
3V 425	9N 1079	5V 900	15N 2286	8V 1800	25N 4572
3V 450	9N 1143	5V 950	15N 2413	8V 1900	25N 4826
3V 475	9N 1206	5V 1000	15N 2540	8V 2000	25N 5080
3V 500	9N 1270	5V 1060	15N 2692	8V 2120	25N 5385
3V 530	9N 1346	5V 1120	15N 2845	8V 2240	25N 5690
3V 560	9N 1422	5V 1180	15N 2997	8V 2360	25N 5994
3V 600	9N 1524	5V 1250	15N 3175	8V 2500	25N 6350
3V 630	9N 1600	5V 1320	15N 3353	8V 2650	25N 6731
3V 670	9N 1702	5V 1400	15N 3556	8V 2800	25N 7112
3V 710	9N 1803	5V 1500	15N 3810	8V 3000	25N 7620
3V 750	9N 1905	5V 1600	15N 4064	8V 3150	25N 8001
3V 800	9N 2032	5V 1700	15N 4318	8V 3350	25N 8509
3V 850	9N 2159	5V 1800	15N 4572	8V 3550	25N 9017
3V 900	9N 2286	5V 1900	15N 4826	8V 3750	25N 9525
3V 950	9N 2413	5V 2000	15N 5080	8V 4000	25N 10160
3V 1000	9N 2540	5V 2120	15N 5385	8V 4250	25N 10795
3V 1060	9N 2692	5V 2240	15N 5690	8V 4500	25N 11430
3V 1120	9N 2845	5V 2360	15N 5994	8V 4750	25N 12065
3V 1180	9N 2997	5V 2500	15N 6350	8V 5000	25N 12700
3V 1250	9N 3175	5V 2650	15N 6731		
3V 1320	9N 3353	5V 2800	15N 7112		
3V 1400	9N 3556	5V 3000	15N 7620		
		5V 3150	15N 8001		
		5V 3350	15N 8509		
		5V 3550	15N 9017		

<p>Maximum production length: 4500 mm L<sub>a</sub>                      Minimum order quantity:                      Over 1800 mm L<sub>a</sub> =                      20 pieces for non-standard length ranges                      60 pieces for special constructions</p> <p>Weight: ≈ 0.074 kg/m</p>	<p>Maximum production length: 18 000 mm L<sub>a</sub>                      Minimum order quantity:                      Over 1800 mm L<sub>a</sub> =                      25 pieces for non-standard length ranges                      75 pieces for special constructions</p> <p>Weight: ≈ 0.195 kg/m</p>	<p>Maximum standard production length:                      21 000 mm L<sub>a</sub>                      Over 18 000 to 21 000 mm on request                      Minimum order quantity:                      Over 2540 mm L<sub>a</sub> =                      11 pieces for non-standard length ranges                      33 pieces for special constructions                      Weight: ≈ 0.575 kg/m</p>
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Lengths in **bold** type are in S=C Plus (SetConstant).