PRODUCT DESCRIPTION
TIMING BELTS IN optibelt OMEGA PROFILE
STANDARD PROPERTIES

All optibelt OMEGA timing belts have inherent resistance to oil, heat, cold, ozone and tropical conditions. Special labelling is not required.

Oil resistance
The limited oil resistance prevents the damaging effects of mineral oils and greases, as long as these substances are not in permanent contact with the timing belt and/or are not present in large quantities. With increased demands for resistance, e.g. to mineral oils, the performance of the optibelt OMEGA timing belts can be improved by using special belt constructions. Please contact the optibelt Application Engineering Department.

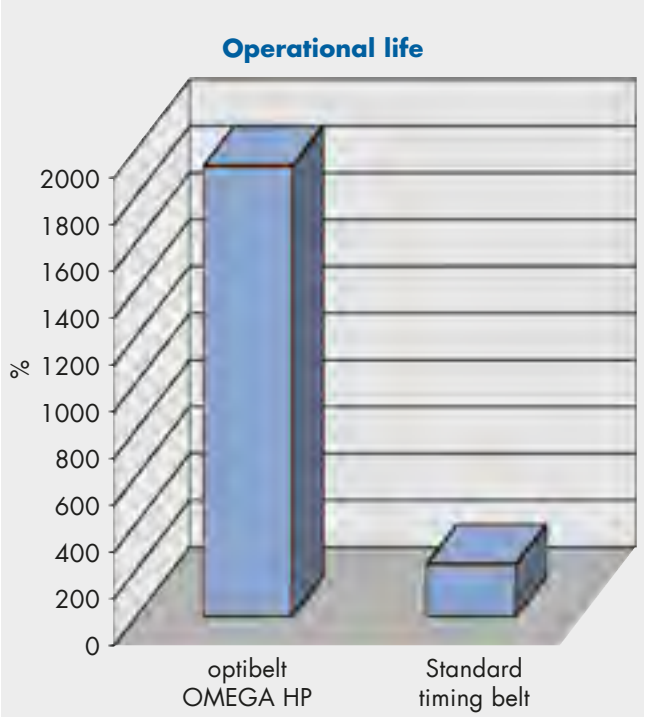
Temperature resistance
The timing belt can withstand ambient temperatures from ≈ –30 °C to +100 °C. Temperatures outside this range lead to premature ageing and embrittlement of the timing belts and thus to their premature failure. The temperature resistance of optibelt OMEGA timing belts can be extended using special belt constructions, e.g. up to +140 °C. Please contact the OPTIBELT Application Engineering Department.

Antistatic properties
Antistatic properties enable the safe discharge of electrostatic charges. This charging can have such a strong impact on timing belts with insufficient electrical conductivity that there is the danger of ignition due to sparks. The use of antistatic timing belts requires that the properties be checked in accordance with ISO 9563, and is confirmed by the issue of an inspection certificate. OMEGA HP and OMEGA HL timing belts in profiles 8M and 14M as well as OMEGA FAN POWER are antistatic according to ISO 9563 by standard and are thus labelled accordingly.

Noise emission
The optimized tooth shape and the indent in the tooth tip of the optibelt OMEGA promote a significantly lower noise level. In combination with the newly developed materials, the noise level is further reduced, even at high speeds and with high belt tensions.

Operational life
Belt designs with increased capacity can exceed the potential operational life of standard designs many times over, particularly for highly loaded or overloaded drives. Example: Dynamic tests with optibelt OMEGA HP show that the running times, compared to standard timing belts, are up to 18 times higher.

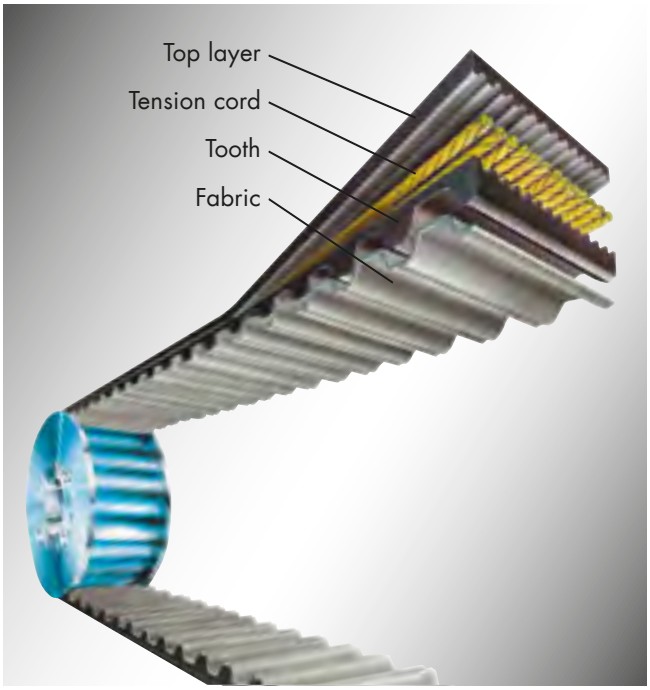
Efficiency
The specially developed tooth fabric and the flexible belt design make possible a virtually frictionless drive with an efficiency of up to 98 %.



Application example: roller path

PRODUCT DESCRIPTION
optibelt OMEGA HP TIMING BELTS

Structure



Top layer
A durable and flexible top layer protects the tension cord from external influences. In addition, the polychloroprene compound is reinforced with aramid fibres and has a degree of resistance to mineral oils and humidity as well as protection from wear and tear due to friction.

Tension cord
The tension cords are reinforced pairs of counter twisted glass fibres. These tension cords have very high tensile strength, very high flexibility and minimal stretch.

Teeth
The teeth consist of a new compound reinforced with aramid fibres, which guarantee high shear strength. They are shaped and exactly spaced in such a way that they mesh perfectly with the pulley teeth with minimal friction. The indent in the tooth guarantees quiet running.

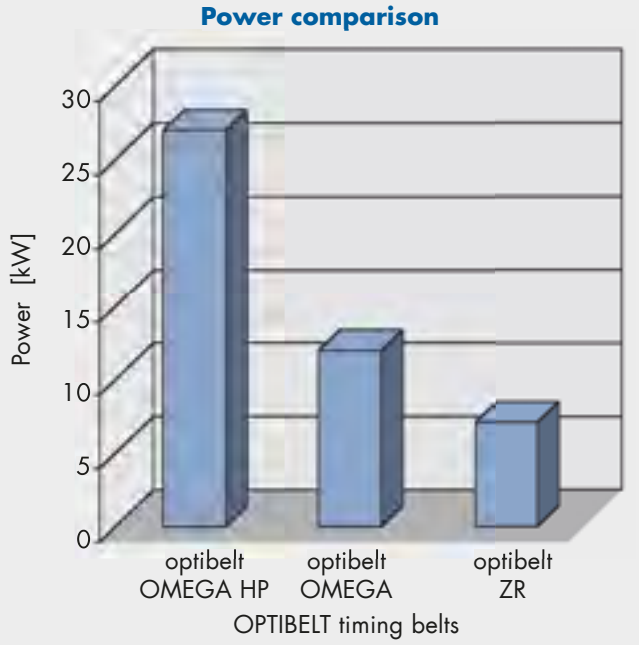
Fabric
The specially developed polyamide fabric stands out due to its extraordinarily low frictional coefficient and its low noise characteristics.
It also protects the teeth from early wear and tear and prevents tooth shear.

The high performance timing belt for high load, high speed machine drives
Compact synchronous drives are used in the whole field of mechanical drive engineering. High power transmission capability, good running characteristics and high operational safety are only some of the demands made on timing belts. Modern manufacturing techniques and quality inspections during all processing stages ensure products with highest reliability. optibelt OMEGA HP high performance timing belts have been especially developed for high load, low and high speed drives that are evenly loaded without heavy shock. Improved materials and optimised production form the basis for this very high performance range.
optibelt OMEGA, OMEGA HP and OMEGA HL timing belts are used in optibelt ZRS HTD® timing belt pulleys or in optibelt ZRS RPP® timing belt pulleys. For applications using other pulleys, please contact the OPTIBELT Application Engineering Department.

Application example: test bench

The new high performance timing belt optibelt OMEGA 5M HP
In the field of the high performance timing belts the optibelt OMEGA 5M HP has been developed for small pulley diameters, short centre distances and high speeds.
The optibelt OMEGA 5M HP transmits up to 3 times the power of an optibelt OMEGA 5M (an increase in power of up to 200%). The performance level of the optibelt OMEGA 5M HP roughly corresponds with the level of the considerably larger section optibelt OMEGA 8M – with the same pulley diameters.

PRODUCT DESCRIPTION
optibelt OMEGA HP TIMING BELTS



Power ratings overview

Profile and design	8M HP	8M	H
Pitch [mm]	8	8	12.7
Width [mm]	20	20	19.05
Pulley diameter [mm]	96.77	96.77	97.02
Speed [min^{-1}]	2850	2850	2850
Nominal power [kW]	**24.4**	**10.8**	**6.0**

Preferred application areas

- textile machines
- machine tools
- compressors
- printing machines
- wood working machines
- paper machines

Overview of the advantages and characteristics of the optibelt OMEGA HP

- dimensionally stable structure with high flexibility
- low permanent and elastic stretch of the cord
- friction and abrasion resistant fabric with high shear strength
- approximately double power transmission capability (profile 5M HP approximately trebles the power transmission capacity) compared to OMEGA timing belts in their standard design
- suitable for low and high speed, high load drives
- good resistance and smooth operation, low and medium shock load
- large range of applications
- electrical antistatic according to ISO 9563 confirmed on request

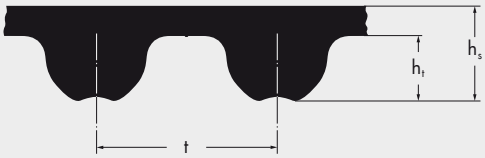
Advantages and characteristics of a drive with optibelt OMEGA HP timing belts in these application areas

- considerably reduced drive volume compared to OMEGA timing belts in standard design
- reduced costs for belts and pulleys
- greater options for drive design
- reduced shaft diameters and smaller bearings
- reduced running noise levels
- improved efficiency

Significant system cost reduction and high operational reliability for even greater economic efficiency in new drives

For additional advantages and characteristics, see optibelt OMEGA on page 20.

PRODUCT DESCRIPTION
optibelt OMEGA HP TIMING BELTS
STANDARD PRODUCT RANGE



Profile	14M HP
t [mm]	14.0
h_s [mm]	9.5
h_t [mm]	5.6

optibelt OMEGA 14M HP

Belt designation	Pitch length [mm]	Number of teeth	Belt designation	Pitch length [mm]	Number of teeth
966 14MHP	966.00	69	2800 14MHP	2800.00	200
1092 14MHP	1092.00	78	3150 14MHP	3150.00	225
1190 14MHP	1190.00	85	3360 14MHP	3360.00	240
1344 14MHP•	1344.00	96	3500 14MHP	3500.00	250
1400 14MHP	1400.00	100	3850 14MHP	3850.00	275
1456 14MHP•	1456.00	104	4326 14MHP	4326.00	309
1512 14MHP•	1512.00	108	4578 14MHP	4578.00	327
1610 14MHP	1610.00	115			
1680 14MHP•	1680.00	120			
1778 14MHP	1778.00	127			
1890 14MHP	1890.00	135			
2100 14MHP	2100.00	150			
2310 14MHP	2310.00	165			
2450 14MHP	2450.00	175			
2590 14MHP	2590.00	185			

Standard width: 40 mm, 55 mm, 85 mm, 115 mm, 170 mm
(Further sizes and special width ranges on request) • Not available ex stock

Order example:

TIMING BELTS: optibelt OMEGA HP 1400 14M HP 55

1400 = 1400 mm pitch length
14M HP = profile and design
55 = 55 mm belt width

POWER RATINGS
optibelt OMEGA HP TIMING BELTS
PROFILE AND DESIGN 14M HP

Table 19

Nominal power P_N [kW] for profile and design 14M HP and a timing belt width of 40 mm

Speed of the small pulley n_k [min^{-1}]	Number of teeth on the small pulley z_k																
	28	29	30	32	34	36	38	40	42	44	46	48	52	56	64	72	80
	Pitch diameter of the small pulley d_{wk} [mm]																
	124.78	129.23	133.69	142.60	151.52	160.43	169.34	178.25	187.17	196.08	204.99	213.90	231.73	249.55	285.21	320.86	356.51
10	0.46	0.49	0.51	0.54	0.58	0.62	0.67	0.70	0.74	0.78	0.82	0.86	0.93	1.00	1.15	1.30	1.44
20	0.88	0.91	0.94	1.02	1.11	1.17	1.25	1.32	1.39	1.47	1.54	1.61	1.75	1.90	2.17	2.46	2.73
40	1.62	1.69	1.76	1.90	2.04	2.17	2.32	2.45	2.58	2.72	2.85	2.99	3.25	3.52	4.05	4.56	5.08
60	2.37	2.47	2.57	2.78	2.97	3.18	3.38	3.58	3.78	3.98	4.17	4.36	4.75	5.14	5.92	6.67	7.43
100	3.73	3.89	4.06	4.38	4.71	5.03	5.34	5.67	5.98	6.30	6.61	6.92	7.54	8.16	9.37	10.58	11.78
200	6.91	7.21	7.52	8.12	8.74	9.33	9.93	10.52	11.12	11.71	12.29	12.87	14.03	15.19	17.47	19.71	21.93
300	9.87	10.30	10.74	11.62	12.50	13.36	14.22	15.08	15.93	16.78	17.62	18.46	20.12	21.78	25.05	28.28	31.46
400	12.68	13.26	13.83	14.96	16.08	17.21	18.33	19.42	20.53	21.63	22.71	23.80	25.95	28.09	32.31	36.47	40.56
500	15.40	16.09	16.79	18.17	19.56	20.92	22.28	23.64	24.97	26.30	27.63	28.95	31.56	34.18	39.31	44.36	49.33
600	18.02	18.85	19.67	21.30	22.91	24.53	26.12	27.70	29.28	30.86	32.40	33.95	37.02	40.09	46.09	51.99	57.80
700	21.08	22.05	23.01	24.93	26.83	28.73	30.60	32.46	34.31	36.15	37.97	39.79	43.38	46.96	53.99	60.87	67.63
800	23.08	24.14	25.20	27.29	29.38	31.45	33.51	35.56	37.58	39.60	41.59	43.59	47.51	51.43	59.11	66.62	73.99
1000	27.92	29.21	30.50	33.04	35.58	38.09	40.59	43.06	45.51	47.97	50.37	52.78	57.52	62.25	71.48	80.46	89.22
1200	32.57	34.08	35.59	38.57	41.54	44.48	47.40	50.28	53.14	56.00	58.81	61.61	67.10	72.60	83.25	93.56	103.56
1450	38.39	40.17	41.95	45.50	48.99	52.46	55.89	59.29	62.64	66.00	69.28	72.57	78.96	85.35	97.68	109.49	120.81
1600	41.42	43.35	45.27	49.09	52.86	56.60	60.30	63.97	67.58	71.18	74.71	78.23	85.08	91.93	105.03	117.53	129.41
1800	45.63	47.76	49.89	54.09	58.26	62.36	66.44	70.44	74.39	78.34	82.20	86.05	93.49	100.92	115.03	128.36	
2000	49.73	52.05	54.38	58.95	63.48	67.94	72.35	76.70	80.97	85.24	89.39	93.54	101.49	109.45	124.42		
2200	53.65	56.15	58.65	63.58	68.45	73.24	77.96	82.62	87.17	91.71	96.12	100.52	108.90	117.28			
2400	57.57	60.25	62.92	68.21	73.43	78.54	83.58	88.54	93.36	98.19	102.85	107.51	116.31	125.11			
2600	61.25	64.10	66.95	72.55	78.06	83.46	88.78	93.99	99.04	104.10	108.95	113.81					
2850	64.94	67.96	70.98	76.89	82.70	88.38	93.98	99.44	104.72	110.01	115.06	120.10					
3000	67.06	70.17	73.28	79.38	85.35	91.20	96.93	102.52	107.93	113.33	118.46	123.60					
3500	76.79	80.30	83.81	90.67	97.34	103.81	110.10	116.20	110.88	116.25	121.48						
4000	84.40	88.20	92.00	99.37	106.48	113.77	121.68	127.06	113.44	118.75							
4500	91.28	95.30	99.33	105.43	113.73	121.63	132.00	135.53									
5000	97.36	101.56	105.73	108.83	119.75	127.31											
5500	102.61	106.91	111.16	109.50													
6000	106.99	111.30															

Power ratings for other belt widths can be calculated by multiplying by the width correction factors.

Width correction factor					
Profile and design 14M HP					
Standard belt width [mm]	40	55	85	115	170
Factor	1.00	1.44	2.50	3.50	5.32