

***Recovery Of Valuable Raw Materials -  
Protection Of Machines And Plants***



***Technology  
Full Of  
Attraction***



wagner  
magnete

# L 452 e

## ELECTROMAGNETIC BELT SEPARATOR

### Proven construction

The 452 series is a further development of the successful 451 series, which has had thousands of devices in hard continuous operation all over the world since 1998. The basic concept was taken over with the large drive and redirecting rollers, and some small changes and standardizations were made in the area of the tensioning bearings, the protection devices and on the frame construction. The outer dimensions and positions of the attachment eyes remain the same.

DIMENSIONS AND TECHNICAL DATA									
Type	belt width mm		working distance mm	weight kg	magnet kW	drive kW	overall dimensions		
	across	inline					length	width	height
452-60/60-290	650	650	150-250	750	1,3	1,5	1700	1250	700
452-60/80-290	800	650	150-250	920	1,7	1,5	1900	1250	700
452-60/100-290	1000	650	150-250	1095	2,0	1,5	2100	1250	700
452-60/120-290	1200	650	150-250	1280	2,3	1,5	2300	1250	700
452-75/75-400	800	800	200-300	1500	2,1	2,2	2250	1400	780
452-75/100-400	1000	800	200-300	1930	2,7	2,2	2450	1400	780
452-75/120-400	1200	800	200-300	2050	3,2	2,2	2650	1400	780
452-75/140-400	1400	800	200-300	2300	3,5	2,2	2850	1400	780
452-95/95-450	1000	1000	250-350	2430	3,1	2,2	2450	1600	780
452-95/120-450	1200	1000	250-350	2890	3,8	2,2	2650	1600	780
452-95/140-450	1400	1000	250-350	3200	4,3	2,2	2850	1600	780
452-95/160-450	1600	1000	250-350	3500	4,8	2,2	3050	1600	780
452-95/95-600	1000	1000	300-400	3160	3,4	2,2	2800	1650	850
452-95/120-600	1200	1000	300-400	3750	4,2	2,2	3000	1650	850
452-95/140-600	1400	1000	300-400	4210	5,0	2,2	3200	1650	850
452-95/160-600	1600	1000	300-400	4800	5,8	2,2	3400	1650	850
452-115/115-470	1200	1200	320-420	2950	4,1	3,0	2650	1850	800
452-115/140-470	1400	1200	320-420	3700	4,8	3,0	2850	1850	800
452-115/160-470	1600	1200	320-420	4200	5,4	3,0	3050	1850	800
452-115/180-470	1800	1200	320-420	4700	6,0	3,0	3250	1850	800
452-115/115-600	1200	1200	350-480	3900	4,6	3,0	3000	1850	870
452-115/140-600	1400	1200	350-480	4900	5,4	3,0	3200	1850	870
452-115/160-600	1600	1200	350-480	5550	5,8	3,0	3400	1850	870
452-115/180-600	1800	1200	350-480	6200	6,3	3,0	3600	1850	870
452-130/130-470	1400	1400	380-520	3940	4,9	4,0	2850	2100	910
452-130/160-470	1600	1400	380-520	5050	5,8	4,0	3050	2100	910
452-130/180-470	1800	1400	380-520	5790	6,4	4,0	3250	2100	910
452-130/200-470	2000	1400	380-520	6530	7,1	4,0	3450	2100	910
452-130/130-600	1400	1400	400-540	5200	5,5	4,0	3150	2100	980
452-130/160-600	1600	1400	400-540	6600	6,5	4,0	3350	2100	980
452-130/180-600	1800	1400	400-540	7350	7,1	4,0	3550	2100	980
452-130/200-600	2000	1400	400-540	8100	7,7	4,0	3750	2100	980
452-150/150-470	1600	1600	410-550	5200	6,5	4,0	3050	2300	910
452-150/180-470	1800	1600	410-550	6300	7,5	4,0	3250	2300	910
452-150/200-470	2000	1600	410-550	6950	8,2	4,0	3450	2300	910
452-150/220-470	2200	1600	410-550	7600	8,9	4,0	3650	2300	910
452-150/150-600	1600	1600	430-580	7000	7,1	4,0	3150	2300	980
452-150/180-600	1800	1600	430-580	8350	8,1	4,0	3350	2300	980
452-150/200-600	2000	1600	430-580	9300	8,8	4,0	3550	2300	980
452-150/220-600	2200	1600	430-580	10300	9,6	4,0	3750	2300	980

We would be more than happy to help you select the right magnet separator for your purposes. Please give us a call or send us a fax or e-mail. A corresponding data sheet that can be downloaded and filled in can be found at: [www.wagner-magnete.de](http://www.wagner-magnete.de)

## Standard design

The stable fastening brackets are directly welded to the magnet body. A worm gear motor drives the outgoing belt using large rollers. The large diameter reduces the work required and therefore reduces wear on the discharge belt. The bearings are generously dimensioned and are protected from dirt using conical bearing rings. The motor is fastened using a torque support that we developed, and its position can be easily changed as needed. For magnets up to 3.5 kW, there is a type with rectifier attached. The discharge belts are available in many different qualities. We would be more than happy to help you select the right magnet separator.

DIMENSIONS													
magnet dimensions			d	e	f	g	h	o	p	r	t	w	y
a	b	c											
600	600	290	315	1092	500	475	650	1695	32	25	1010	-	1260
600	800	290	315	1092	700	475	650	1895	32	25	1010	-	1460
600	1000	290	315	1092	900	475	650	2095	32	25	1010	-	1660
600	1200	290	315	1092	1100	475	650	2295	32	25	1010	-	1860
750	750	400	503	1242	600	505	800	2240	32	25	1160	-	1565
750	1000	400	503	1242	900	505	800	2440	32	25	1160	-	1765
750	1200	400	503	1242	1100	505	800	2640	32	25	1160	-	1965
750	1400	400	503	1242	1300	505	800	2840	32	25	1160	-	2165
950	950	450	503	1442	800	505	1000	2440	32	25	1360	-	1765
950	1200	450	503	1442	1100	505	1000	2640	32	25	1360	-	1965
950	1400	450	503	1442	1300	505	1000	2840	32	25	1360	-	2165
950	1600	450	503	1442	1500	505	1000	3040	32	25	1360	-	2365
950	950	600	650	1452	800	510	1000	2755	42	35	1360	-	1935
950	1200	600	650	1452	1100	510	1000	2955	42	35	1360	-	2135
950	1400	600	650	1452	1300	510	1000	3155	42	35	1360	-	2335
950	1600	600	650	1452	1500	510	1000	3355	42	35	1360	-	2535
1150	1150	470	503	1642	1000	505	1200	2640	32	25	1560	-	1965
1150	1400	470	503	1642	1300	505	1200	2840	32	25	1560	-	2165
1150	1600	470	503	1642	1500	505	1200	3040	32	25	1560	-	2365
1150	1800	470	503	1642	1700	505	1200	3240	32	25	1560	-	2565
1150	1150	600	650	1652	1000	510	1200	2955	42	35	1560	-	2135
1150	1400	600	650	1652	1300	510	1200	3155	42	35	1560	-	2335
1150	1600	600	650	1652	1500	510	1200	3355	42	35	1560	-	2535
1150	1800	600	650	1652	1700	510	1200	3555	42	35	1560	-	2735
1300	1300	470	503	1842	1200	560	1400	2840	32	25	1760	-	2370
1300	1600	470	503	1842	1500	560	1400	3040	32	25	1760	-	2570
1300	1800	470	503	1842	1700	560	1400	3240	32	25	1760	-	2770
1300	2000	470	503	1842	1900	560	1400	3440	32	25	1760	900	2970
1300	1300	600	650	1852	1200	560	1400	3150	42	35	1760	-	2330
1300	1600	600	650	1852	1500	560	1400	3350	42	35	1760	-	2530
1300	1800	600	650	1852	1700	560	1400	3550	42	35	1760	-	2730
1300	2000	600	650	1852	1900	560	1400	3750	42	35	1760	-	2930
1500	1500	470	503	2042	1400	560	1600	3040	32	25	1960	-	2270
1500	1800	470	503	2042	1700	560	1600	3240	32	25	1960	-	2570
1500	2000	470	503	2042	1900	560	1600	3440	32	25	1960	900	2770
1500	2200	470	503	2042	2100	560	1600	3640	32	25	1960	1100	2970
1500	1500	600	650	2052	1400	560	1600	3150	42	35	1960	-	2530
1500	1800	600	650	2052	1700	560	1600	3350	42	35	1960	-	2730
1500	2000	600	650	2052	1940	560	1600	3550	42	35	1960	-	2930
1500	2200	600	650	2052	2100	560	1600	3750	42	35	1960	1100	3130

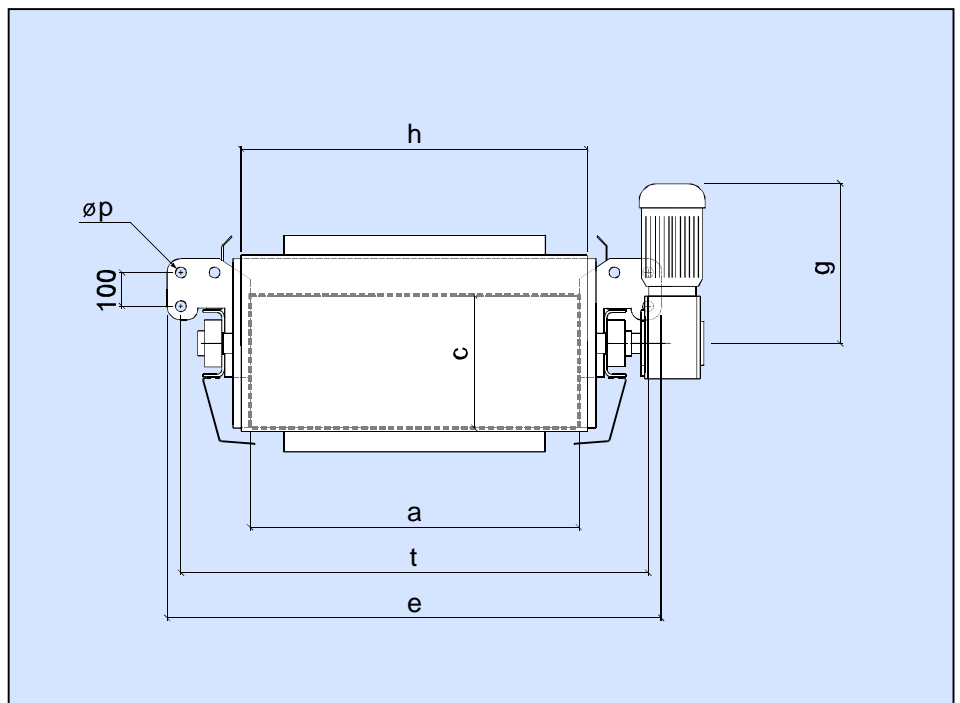
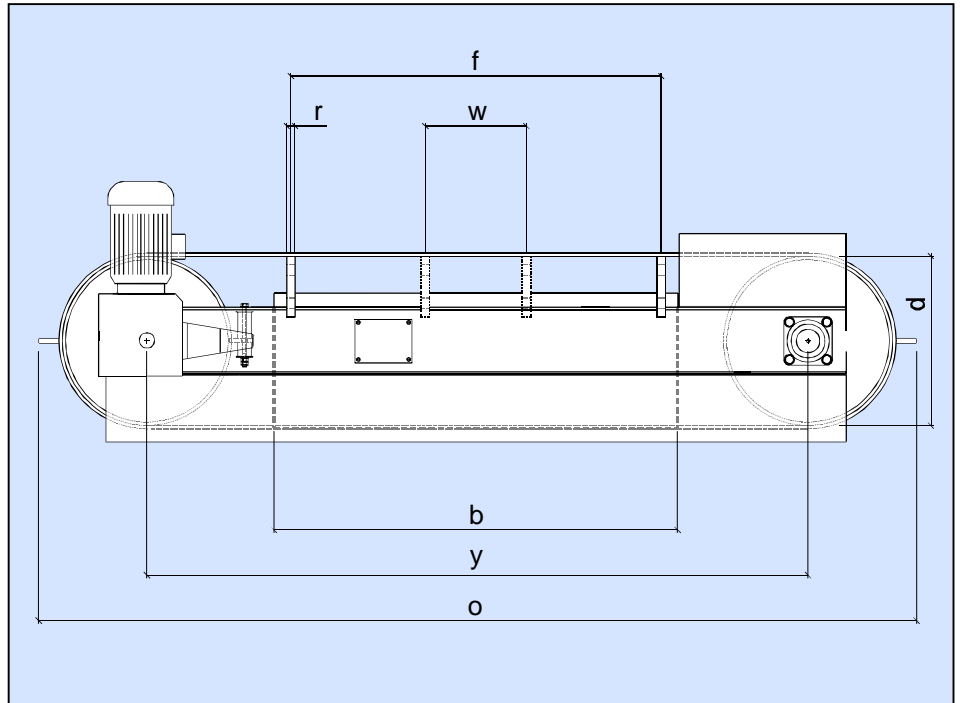


The non-ferrous separators can also be delivered as devices protected against explosions according to ATEX 95 (RL94/9). For additional information, please see our I Ex-1 leaflet!

## Oil cooled design

If the customer's conditions cause limited dimensions or a low-weight magnet separator is a considerable advantage, then an oil cooled electromagnet should be used. The oil that fills the magnet allows the heat from the coils to better dissipate from the inside of the magnet. Oil cooled electromagnets can have increased currents applied but still have the same temperature inside the coils. In this way, a magnet can achieve approximately the same effectiveness when removing tramp iron as the next larger type. Take note of the higher electrical power consumption, the slightly increased weight and the higher magnet surface temperature. The special oil expands when heated; therefore oil cooled electromagnets have an expansion container attached to them.

OIL COOLED DESIGN		
working distance mm	weight kg	magnet kW
180-280	820	1,9
180-280	1000	2,5
180-280	1200	3,0
180-280	1400	3,4
240-340	1650	3,0
240-340	2100	4,1
240-340	2250	4,6
240-340	2500	5,2
280-380	2600	4,7
280-380	3100	5,4
280-380	3450	6,5
280-380	3750	7,2
350-450	3400	5,1
350-450	4000	6,3
350-450	4500	7,5
350-450	5100	8,7
370-500	3200	6,2
370-500	3950	7,2
370-500	4500	8,1
370-500	5050	9,3
390-550	4200	6,7
390-550	5200	7,6
390-550	5900	8,7
390-550	6600	9,1
400-560	4200	7,4
400-560	5400	8,7
400-560	6200	9,6
400-560	7000	10,7
430-590	5600	8,3
430-590	7150	9,7
430-590	7800	10,6
430-590	8600	11,5
440-600	5500	9,8
440-600	6700	11,3
440-600	7350	12,3
440-600	8050	13,4
460-620	7400	10,6
460-620	8850	12,1
460-620	9850	13,2
460-620	10900	14,4

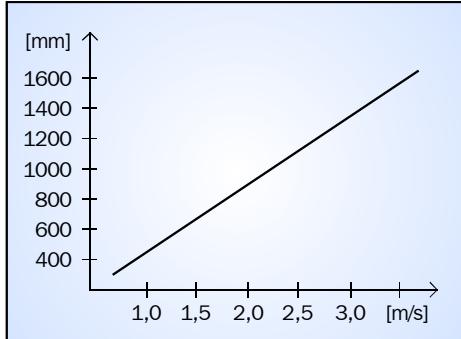


### Extended poles

Extended poles over the entire length of the magnet guarantee secure and trouble-free removal of ferrous items.

## General information

The distance between a magnet and the conveyor should be as small as possible because the magnetic force decreases exponentially over distance. At the same time, it is important to make sure that the distance is at least large enough so that the discharge belt can securely remove all attracted ferrous items from the material flow. Material on the conveyor that is in larger pieces requires a larger working distance in order to prevent jamming of the material, even for low theoretical layer depths. The magnet must be positioned so that the entire width of the conveyor is covered and so that the ferrous items being removed do not fall off too early. A rotating separating roller on the ejector chute can prevent foil from collecting on the separating roller.



## Dimensioning notes

Iron parts need to be in a magnetic field for at least 0.4 to 0.5 seconds in order to be magnetized and pulled out of the material flow. The size of the magnet block must be selected accordingly in order to secure enough dwelling time.

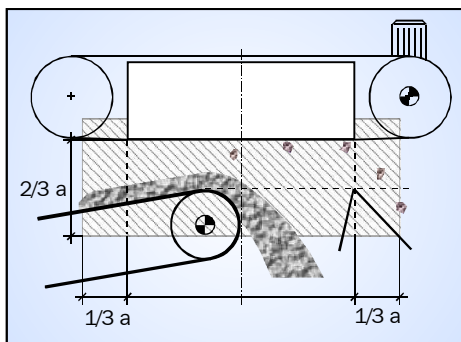
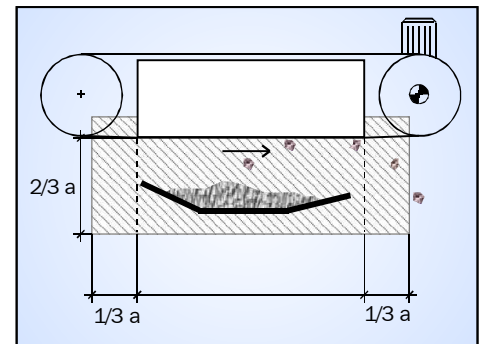
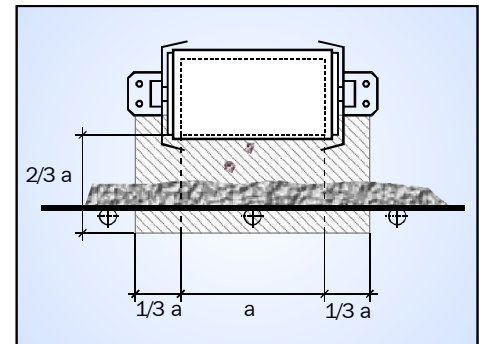
The diagram shows the relationship between belt speed and the required magnet dimensions in the direction of the conveyor.

## Crosswise installation

The magnet length must be at least the same as the width of the conveyor belt. The magnet width depends on the speed of the material flow and must be selected so that the material on the conveyor remains in the magnetic field for the required duration. In general, we recommend a low trough formed conveyor belt. This improves ferrous item removal and prevents damage caused by wedging long or bulky ferrous items between the magnet and conveyor equipment.

Make sure that the ferrous items to be removed cannot get caught on the edge of the belt, the material feeds or the conveyor belt construction. The ejection area should have a generously sized opening. Extracting flat and fibrous material (foil, cords and bands) is more frequent with crosswise installation than it is with inline installation.

If long or bulky ferrous items are included in the material on the conveyor or the transport speed of the material on the conveyor exceeds 3 m/s, the magnet should generally be placed lengthwise over the head roller.



## In-line installation

The magnet width is not permitted to be smaller than the width of the conveyor belt. Make sure that the material flow is covered sufficiently by the magnet before it leaves the conveyor. We recommend placing the middle axis of the magnet body at a tangent to the head roller. The end of the magnet body is not permitted to be located before the separating roller of the ejector chute. The upper part of the ejector chute and the head roller must be made of non-magnetic materials.

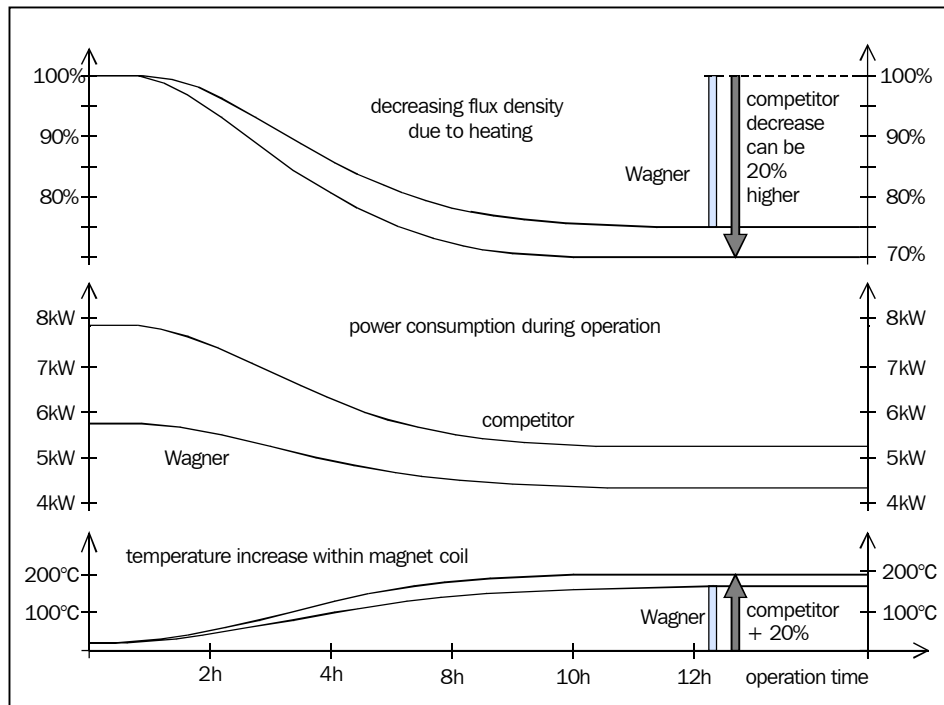
## Importance of the non-magnetic zone

Magnetic fields are concentrated in materials that conduct magnetism well. For example, steel conducts magnetism much better than air and reduces the effectiveness of the magnetic fields through a magnetic short-circuit. All construction parts that can be magnetized within the hatched zone significantly reduce the effectiveness of the magnets. Additionally, they disturb lifting and removal of the ferrous items because they become magnetic themselves and the ferrous items are attracted to them. For this reason, carrier rollers, cross pieces, divider panels, material feeds and chutes must be removed from the non-magnetic zone or made of non-magnetic materials.

## ELECTROMAGNETIC BELT SEPARATOR

### Optimized performance

Electromagnets are optimally designed when the magnet body heats up as slowly as possible and to the least extent as possible during on-time. Heating results in a reduced magnetic effect. Magnet system with a low electrical load create less heat and are therefore stronger than magnets with a larger electrical power consumption at operating temperature. Using the most modern calculation procedures, we adjust all magnet coils and ferrous circuits to each other as precisely as possible. New wire and insulation materials as well as clever winding techniques allow us to manufacture robust coils with a very high number of windings. The differences and advantages as compared to other techniques can be seen in the example.



#### Wagner 452-115/140-470:

Dimensions 1150 x 1400 x 470 mm  
Magnet surface 5,6 m<sup>2</sup>

Coltage 220 Volt DC  
Electrical power cold 4,8 kW  
Current cool 21,8 A

#### Competitor magnet:

Dimensions 1140 x 1480 x 500 mm  
Magnet surface 6,0 m<sup>2</sup>

Voltage 108 Volt DC  
Electrical power cold 6,9 kW  
Current cold 63,9 A

The image shows the behavior of important characteristics of a Wagner Magnete electromagnet belt separator type 452-115/140-470 as compared to a device from a competitor. The power consumption (=energy applied) is approx. 45% higher for the device from the competitor. The electrical energy applied is dissipated as heat from the surface of the magnet into the surroundings. The considerably increased heat loss for a slightly larger surface area results in faster and more pronounced heating of the magnet coil on the device from the competitor. As the coil temperature increases, the coil resistance increases, and the magnet current and the power consumption are reduced. The magnetic flux density is directly dependent on the magnet current; therefore the strength of the magnet is also reduced. The higher the rated power for the magnet, the more the strength is reduced.

#### Available discharge belts:

BF: oil resistant belt  
BV: improved belt  
BR: belt with REMA coating  
BH: heat resistant belt  
BS: belt with special studs  
BW: belt with 35/60 mm high studs

Special designs can be manufactured.

#### Driving motor possibilities:

G1: geared motor Flender  
G2: geared motor SEW  
G6: geared motor NORD  
K: with temperature sensor

#### Special designs:

S-0: with integrated rectifier  
Combination with permanent magnet

#### Accessories:

Off-track monitor  
Suspension devices  
Zero-speed monitor  
Current monitor  
Special protection devices  
Nonmagnetic conveyor rollers