

Permanent and electromagnetic sheet separators
for steel sheet producers and the automotive industry

Magnetic

conveying systems



Sheet separators
E n g l i s h

GOUDSMIT
MAGNETIC CONVEYING SYSTEMS

Sheet separators

permanent and electromagnetic



Ants are insignificant creatures that most people do not seem to notice. Something similar applies to Goudsmit sheet separators. Even though we have supplied many thousands of our sheet separators to the sheet processing and automotive industries, people in production environments hardly seem to notice them. The cover shows a picture of Texan leaf-cutting worker ants. This is a very industrious species, known for their exceptional strength and productivity. For example, these ants can carry objects up to 30 times their own bodyweight and strip a shrub of its leaves in 10 minutes. One by one they transport the leaves to their underground gardens to grow the fungi that serve to feed the colony. In fact the whole arrangement strongly resembles an industrial process. Goudsmit's sheet separators, with their inexhaustible magnetic force, are similarly cut out for their job. The steel sheets are lifted from the stack in rapid succession by the extraordinarily powerful magnetic field. The sheets are then removed systematically, one by one, to ensure a smooth production process.

Applications

To loosen and separate sticky or oily steel sheets.
To prevent tool and die damage by eliminating double blank problems.

Features

As steel sheets are placed against the sheet separator, the powerful magnetic field automatically forces the sheets apart and separates them from one another. When the top sheet is removed, the next sheet instantly moves up. As soon as the sheets are removed from the separator, they are no longer magnetised. Available in permanent magnetic as well as electromagnetic models.

Benefits

Goudsmit sheet separators are suitable for the separation of sheets of almost any length, width or shape, including round and asymmetrical products. The permanent magnetic power does not decrease and is guaranteed for several decades. You will no longer need to use expensive compressed air systems to separate the steel sheets, as separating magnets will do the job at a much lower cost.



Construction

Robust construction with an extra heavy stainless steel housing to protect the magnet system inside. The sophisticated construction of the magnet system ensures optimum separating power while reducing dimensions.

Goudsmit sheet separators are available in three models:

- With a permanent Ferrite magnet system for the most common applications.
- With an extra strong Neoflux® magnet system in a compact design to separate extremely oily or sticky sheets.

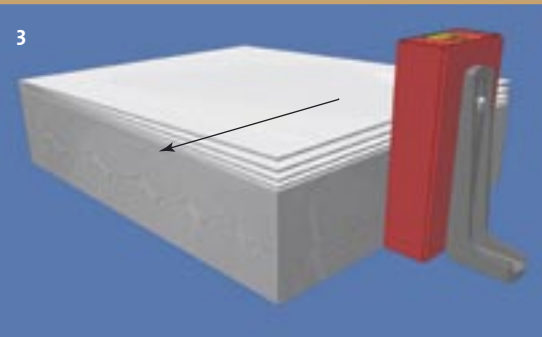
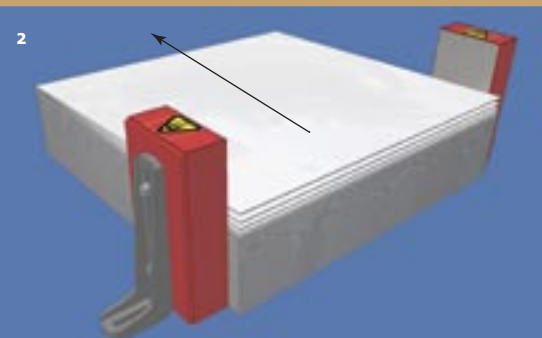
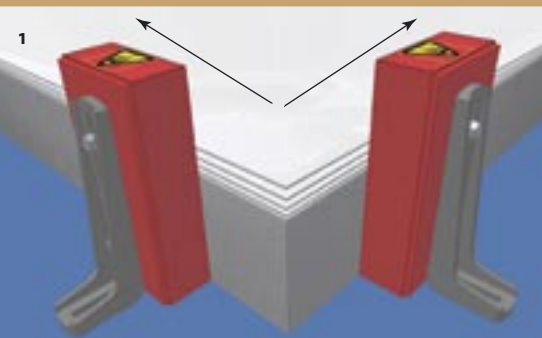
- With an electromagnet system that can be switched off to fill up or remove the steel sheets.

Goudsmit sheet separators are available in a wide range of sizes and types.

Goudsmit can provide special separators for specific applications fully in accordance with your specifications.

TECHNICAL DATA PERMANENT MAGNETIC SHEET SEPARATORS						
SERIES TYPE	MAGNET SYSTEM	WORKING TEMPERATURE	DIAMETER, WIDTH X THICKNESS	SHEET THICKNESS	RECOMMENDED WORKING AREA	
					CLEAN AND DRY SHEETS	OILY AND STICKY SHEETS
TB SP 00 ----	Permanent magnetic Ferrite, 1800 Gauss	-20 °C/100 °C	73 x 29 mm	≤ 1,0 mm	23 dm ²	15 dm ²
TB SP 02 ----	Permanent magnetic Ferrite, 1900 Gauss	-20 °C/100 °C	114 x 47 mm	≤ 2,5 mm	32 dm ²	21 dm ²
TB SP 03 ----	Permanent magnetic Ferrite, 1950 Gauss	-20 °C/100 °C	154 x 47 mm	≤ 4,0 mm	40 dm ²	26 dm ²
TG SP 00 ----	Permanent magnetic Neoflux®, 3200 Gauss	-20 °C/60 °C	43 x 22 mm	≤ 1,4 mm	21 dm ²	14 dm ²
TG SP 01 ----	Permanent magnetic Neoflux®, 3400 Gauss	-20 °C/60 °C	73 x 22 mm	≤ 2,4 mm	30 dm ²	20 dm ²
TG SP 02 ----	Permanent magnetic Neoflux®, 3600 Gauss	-20 °C/60 °C	114 x 22 mm	≤ 3,5 mm	38 dm ²	25 dm ²
TE SP 02 ----	Electro magnetic, Switchable, 2000 Gauss	-20 °C/50 °C	114 x 90 mm	≤ 2,0 mm	28 dm ²	18 dm ²
TE SP 03 ----	Electro magnetic, Switchable, 2600 Gauss	-20 °C/50 °C	154 x 90 mm	≤ 3,0 mm	36 dm ²	23 dm ²

The Goudsmit Magnetics Group is active in the field of magnetism on a world-wide basis for various industries. With around 45 years of experience, Goudsmit has now grown into the most significant manufacturer/producer and supplier of magnetic materials. The Magnetic Conveying Systems division is specialised in the transportation of all ferrous products for the tin can, canned goods, metal and steel goods and automotive industries.



DIMENSIONS PERMANENT MAGNETIC SHEET SEPARATORS

TYPE NUMBER	L	W	T	A	A	S*	THREADED-HOLES	WEIGHT
TB SP 00 0075	75	73	29	45	-	45	2x M8	1,0 kg
TB SP 00 0140	140	73	29	100	-	110	2x M8	1,9 kg
TB SP 00 0270	270	73	29	200	-	240	2x M8	3,5 kg
TB SP 00 0400	400	73	29	150	150	370	3x M8	5,1 kg
TB SP 02 0140	140	114	47	100	-	100	2x M8	4,2 kg
TB SP 02 0270	270	114	47	200	-	230	2x M8	7,9 kg
TB SP 02 0400	400	114	47	150	150	360	3x M8	11,6 kg
TB SP 02 0530	530	114	47	200	200	490	3x M8	15,3 kg
TB SP 03 0210	210	154	47	150	-	170	2x M8	8,2 kg
TB SP 03 0270	270	154	47	200	-	230	2x M8	10,6 kg
TB SP 03 0400	400	154	47	150	150	360	3x M8	15,6 kg
TB SP 03 0530	530	154	47	200	200	490	3x M8	20,6 kg
TG SP 00 0075	75	43	22	45	-	45	2x M8	0,6 kg
TG SP 00 0140	140	43	22	100	-	110	2x M8	1,1 kg
TG SP 00 0210	210	43	22	150	-	180	2x M8	1,5 kg
TG SP 00 0270	270	43	22	200	-	240	2x M8	1,9 kg
TG SP 01 0075	75	73	22	45	-	45	2x M8	1,0 kg
TG SP 01 0140	140	73	22	100	-	110	2x M8	1,7 kg
TG SP 01 0210	210	73	22	150	-	180	2x M8	2,5 kg
TG SP 01 0270	270	73	22	200	-	240	2x M8	3,2 kg
TG SP 02 0140	140	114	22	100	-	110	2x M8	2,7 kg
TG SP 02 0270	270	114	22	200	-	240	2x M8	5,1 kg
TG SP 02 0400	400	114	22	150	150	370	3x M8	7,5 kg

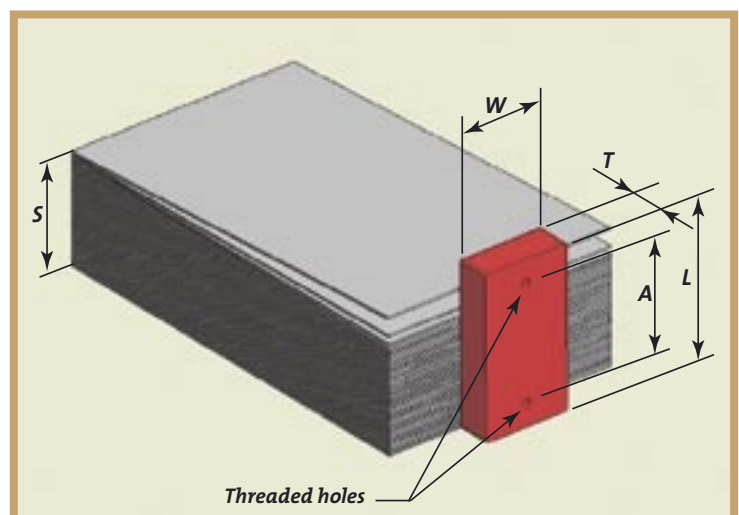
*S = maximum stack height

Dimensions in mm.

Installation examples

Simple mounting using threaded holes at the back of the sheet separators. The arrows in the pictures indicate the recommended transport direction to remove the sheets after separation. To prevent failure at fully automated production lines we recommend installing several extra sheet separators.

- (1) For maximum effectiveness, locate two separators at the corner(s) of large stacks of sheets.
- (2) Separators placed opposite each other will cause the sheets to float.
- (3) Locate a separator in the centre of the short side of smaller sheets.



Sheet separators

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Application example 1

See the table on page 2 for technical data for this calculation example.

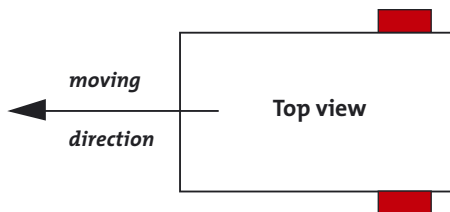
In this workshop area, steel sheets are placed in a press manually. The sheets are 900 mm long, 600 mm wide and 3,0 mm thick. This means we will use sheet separators from the TB SP 03 series, which are suitable for thicknesses of up to 4 mm. The sheets are oily and tend to stick to each other. Under such circumstances, the recommended working area for TB SP 03 sheet separators is 26 dm².

Sheet surface: $9 \times 6 = 54 \text{ dm}^2$.

No. of sheet separators required:

$54 \text{ dm}^2 / 26 \text{ dm}^2 = 2 \text{ pieces}$.

By placing the separators opposite each other the sheets will float and that makes them easier to handle.



Steel sheet dimensions = 900 x 600 mm, thickness = 3,0 mm

(4) CE safe module

Goudsmit has developed a complete sheet separation module dedicated to separating tailored blanks. The module comprises an extra powerful Neoflux® sheet separator with a lever switch. Once switched off, the module can be easily removed thanks to the plastic slippers attached. The jig can then be filled with blanks in less than no time. The module is fitted with a CE guard and a double-handed operation system for reactivating the separator. It has full protection features to prevent fingers getting stuck between the sheets and magnets. The standard crane hook allows the module to be removed easily so that it can be used for different jig settings.

Application example 2

See the table on page 2 for various technical data for this calculation example. An automatic manipulator feeds the steel sheets into a punching machine.

The sheets are 2500 mm long, 1250 mm wide and 2,2 mm thick. This means we will use sheet separators from the TB SP 02 series, which are suitable for thicknesses of up to 2,5 mm.

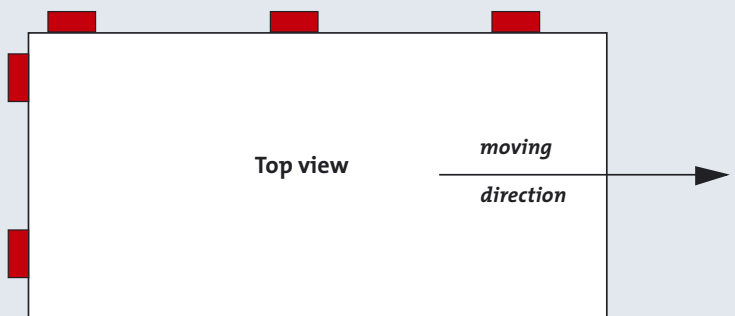
The sheets are reasonably clean and not very sticky. Under such circumstances, the recommended working surface for TB SP 02 sheet separators is 32 dm².

In most automated production processes, only 50% of the sheet needs to be separated for the whole sheet to be removed from the one below.

Spreading surface: $25 \times 12,5 = 313 \text{ dm}^2 \times 50\% = 157 \text{ dm}^2$.

No. of sheet separators required: $157 \text{ dm}^2 / 32 \text{ dm}^2 = 5 \text{ pieces}$.

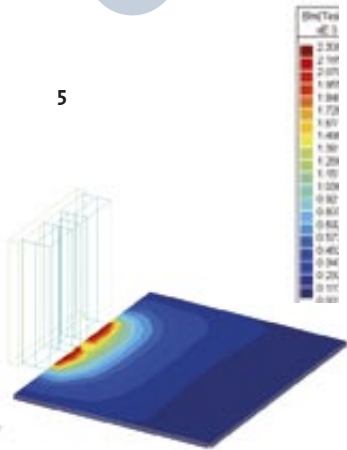
Two sheet separators should be placed in a single corner for extra local separating power. The other separators should be distributed evenly across the adjacent sides.



Steel sheet dimensions = 2500 x 1250 mm, thickness = 2,2 mm



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(5) With the aid of finite-element software, optimum geometric dimensions are calculated for maximum magnetic power and depth effect.

Control Box type ES SS 403501

The ES SS 403501 control box is fitted with a thyristor controller with a semiconductor rectifier and 4 parallel outputs for driving up to 4 electro-magnetic steel sheet separators. The control box can be remote-controlled via a PLC, in which case the magnetic strength is regulated via 0 - 10V potential free contact. By way of overload protection the control box is equipped with a built-in timer to limit active time.

Technical data Control Box
 Type : ES SS 403501
 Dim.: 600 x 300 x 155 mm
 Weight : 16 kg
 Supply voltage : 230V AC
 Maximum current: 25 A
 Output : 4x parallel
 Input : 2x

(6) Electromagnetic sheet separator with control box.

DESIGN DATA OF ELECTRO MAGNETIC SHEET SEPARATORS											
TYPE NUMBER	L	W	T	A	A	S*	THREADED HOLES	CURRENT	POWER CONSUM.	WEIGHT	
TE SP 02 0140	150	114	90	100	-	100	2x M8	3,0 A	400 W	13 kg	
TE SP 02 0270	270	114	90	200	-	220	2x M8	4,5 A	600 W	22 kg	
TE SP 02 0400	400	114	90	150	150	350	3x M8	6,0 A	800 W	31 kg	
TE SP 03 0270	270	154	90	200	-	220	2x M8	7,0 A	925 W	28 kg	
TE SP 03 0400	400	154	90	150	150	350	3x M8	9,0 A	1200 W	41 kg	
TE SP 03 0530	530	154	90	200	200	480	3x M8	12,5 A	1650 W	54 kg	

*S = maximum stack height

Dimensions in mm.

Switchable electromagnetic sheet separators

In addition to being disconnectable, Goudsmit electromagnetic sheet separators are fitted with a control box to adjust the field strength. This makes it possible to produce variable magnetic pulses for loosening up steel sheets that have stuck together. The electromagnetic sheet separators are designed for 30% active time on a supply of 130 V DC, and short loads of up to 180V. All models come with a klixon thermosensor to ensure effective temperature control.

TECHNICAL DATA OF ELECTRO MAGNETIC SHEET SEPARATORS							
SERIES TYPE	NOMINAL VOLTAGE	PEAK VOLTAGE	OPERATING TEMPERATURE	SHEET THICKNESS	RECOMMENDED WORKING AREA		
					CLEAN AND DRY STEEL SHEETS	OILY AND STICKY STEEL SHEETS	
TE SP 02 ----	130 V DC	180 V DC	-20° C / 50° C	≤ 2,0 mm	28 dm ²	18 dm ²	
TE SP 03 ----	130 V DC	180 V DC	-20° C / 50° C	≤ 3,0 mm	36 dm ²	23 dm ²	



Turn-key handling systems & sheetfeeders

Specialist machines are becoming more and more complex and have to meet increasingly stringent requirements. Efficiency, speed and effectiveness are key principles in the development of these installations. Goudsmit provides truly innovative and creative, tailor-made solutions. Goudsmit offers guidance from beginning to end owing to its thematic approach. The systems are tested, set and put into place in a complete and comprehensive manner. Goudsmit remains involved even after delivery and you can always depend on our advice and support.



(7) This sheet feeder was built to the requirements of a Dutch wholesaler in steel sheets and is used to prepare orders. Some clients set specific limits on the total weight per pallet. To meet their requirements, the sheet feeder automatically stacks a certain number of sheets on a second pallet. The sheet feeder can also pick orders consisting of different sheet sizes and thicknesses for a single pallet.



(8) To separate the steel sheets, the installation is fitted with extra strong permanent magnetic Neoflux® sheet separators that allow the separation of sheets up to 6 mm in thickness. Pneumatic cylinders are used to switch the sheet separators on and off via the PLC.

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