50 Years
Reliable. Every time. Everywhere.

Emergency Pneumatics.

Aircraft Lifting Bags

Lifting out of Limits

Place your trust in emergency pneumatics!

We are the enterprise, which helps you to find the right solution!

Vetter GmbH
A Unit of IDEX Corporation

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Sales

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Why recovery equipment

Rapid recovery in critical situations

› allows rapid action on site

› material protecting recovery

„Basically, airplanes are built to fly and have no towing eyes like those on cars“ says Hans Hofer* in describing the challenges of most aircraft recoveries.

In the interest of aerodynamics, modern airplanes are increasingly sensitive in design and construction, with the difficulty that one needs special equipment and know-how to avoid further damage and the resulting additional financial losses when recovering an aircraft.

** Former head of the airport fire brigade Frankfurt, Fraport AG*

Damaged aircrafts can block the runway, taxiway and gate:

- the airport will lose **several million €** per day
  Example: Learjet ca. 0.25 Millionen €
  B 737 ca. 0.50 Millionen €
  A 340 ca. 2.00 Millionen €
- in addition, the airlines **lose** a further **1 -10 million € through flight cancellation and costs for possible passenger compensation**
- damaged image for the airport operator and the airline.

„Aircraft skids off the runway“

Headlines such as these frequently reached us. Recently in the media there has been an increasing number of aircraft skidding off of runways during starts and landings causing the nose to become stuck in snow or in the adjacent grass strip.

A timely removal is the goal of recovery

Foto: Alexander Blum

Why Aircraft Lifting Bags

Secure lifting on any surface

› high lateral load tolerance

› relatively quick to deploy

› smooth lifting by avoiding point loading

› good adaptation to different surfaces

If the taxiway is blocked by an aircraft, the quick and safe action of the recovery team is of particular importance. Aircraft lifting bags are specifically designed to lift aircraft of various sizes and types.
The professional lifting of an aircraft represents the first step for fast and gentle recovery.
In addition to the fast operational readiness, there are numerous other factors that justify the use of aircraft lifting bags.

Why Aircraft Lifting Bags:

- low insertion height of max. 25 cm compared to recovery jacks
- exceptional side stability compared to recovery jacks
- Aircraft Lifting Bags can take sheering forces during angle lift
- because of their contact surface and operating pressure also useable for uneven ground beside the runway
- can be repaired
- long life duration of approx. 18 - 40 years

Aircraft Lifting Bags - quick and secure recovery

Why Vetter

Decades of experience and confidence

- first ALB already produced in 1981
- many years of experience
- individually tested (with inspection seal)
- made in Germany

Since the early 1980s Vetter GmbH has been producing quality aircraft lifting bags for airports around the world at its site in Zülpich.

Long-standing international cooperation with airport fire brigades make Vetter your reliable partner.

The divided contact chambers of Vetter aircraft lifting bags enable optimum adaptation to the attachment surfaces on aircraft, so that the pressure is distributed optimally. With a maximum insertion height of 25 cm and a bag surface of up to 14 m^2, lifting bags are ideal to lift aircraft evenly up to 4 m (without base).

The number of control systems and hoses to be used depends on the number of chambers of the lifting bag sets. In sets with divided contact chambers this can be controlled separately in order to control the sensitive contact with the aircraft more effectively.

The selection of the appropriate aircraft lifting bags depends, among other things, on the following factors:

- Type and positioning of the damaged aircraft
- Recovery weight of the aircraft
- Attachment areas for the aircraft lifting bag
- Specifications of recovery guidelines (maximum surface pressure)

IATA | Strategic Partner

Each set's designation is based on its lifting power and maximum lifting height:

ALB 30/305: at least 30 t (300 kN) lifting power + 305 cm max. lifting height

1.0 bar		
ALB-Sets	**Nominal lift. power**	**max. lifting height**
ALB 3/100 =	66 kN (6,6 t)	100 cm/39 inch
ALB 5/120 =	112 kN (11,2 t)	120 cm/46.8 inch
ALB 14/160 =	280 kN (28 t)	160 cm/62.4 inch
ALB 30/245 =	650 kN (65 t)	245 cm/95.6 inch
ALB 30/305 =	650 kN (65 t)	305 cm/119 inch
ALB 30/380 =	650 kN (65 t)	380 cm/148 inch
ALB 40/305 =	874 kN (87,4 t)	305 cm/119 inch
ALB 60/400 =	1320 kN (132 t)	400 cm/156 inch

Types of Aircrafts		suitable ALB Sets
e.g.	Regional Jets, CRJ 900, Dash 8, F 50	3 x ALB 14/160
e.g.	B 717, B 727, B 737 A 319, A 318 F 100, F 50	2 x ALB 30/245 2 x ALB 30/305
e.g.	B 707, B 727, B 757, B 767 A 300, A 321, A 320	2 x ALB 30/245 4 x ALB 30/305
e.g.	B 747, B 777 A 340, A 330 MD 11	2 x ALB 30/245 4 x ALB 30/305 2 x ALB 40/305

For large airplanes such as the **A380, Vetter** offers you special 60-ton lifting bags.

Vetter offers recovery sets to accommodate various aircraft categories. We would be pleased to assist you in selecting the appropriate set. Please do not hesitate to contact us: +49 (0) 2252/3008-0 or vetter.rescue@idexcorp.com

1 bar technology - The innovation

Our **Vetter** aircraft lifting bags 1 bar/14.5 psi are characterized by their sturdiness, strength, exceptional side stability and stability under load. As opposed to the 0.5 bar/7.25 psi series, the side stability of the 1 bar/14.5 psi series is increased by approx. 40 %. A significantly improved lateral load tolerance provides increased stability and greater safety when lifting aircraft.

The lifting bags, hoses and controllers are fitted with quick-action couplings enabling easy and time-saving inter-coupling of the individual elements. That makes fast and effective recovery possible.

Note: The Vetter Aircraft Lifting Bags are also available with 0.5 bar technology.

ALB 1/23 and 1/13 - The specialist for small aircrafts

Recently we developed the 1-bar ALB 1/13 and ALB 1/23 aircraft lifting bags especially for small airplanes such as Piper, Cessna or Learjet. These lifting bags can be used in recovering small aircraft up to a theoretical recovery weight of 23 tons. With their **low insertion height** of 8 cm and their **low weight**, these lifting bags can be brought into position quickly and easily, even in the smallest openings between the airplane and the ground. Like the normal aircraft lifting bags, they feature protection pads to protect sensitive structures.

Set ALB 1/23

Double ALB deadman controller

Developed especially for small planes such as Cessna

Vetter Contour matching

Optimum adjustment to any shape

- optimum distribution of lifting force
- lifting capacity is fully utilised
- suitable for universal use
- enables minimum pressure point weight

„Straight and round don't match."
Aircraft recovery teams worldwide are faced with extremely difficult and varying situations when carrying out lifting operations of an aircraft on ground. The modern contour matching system developed by Vetter engineers together with Frankfurt airport specialists, is a result of the special needs in such situations. With the new vacuum contour chambers you get a better hold on the situation at the operation site.

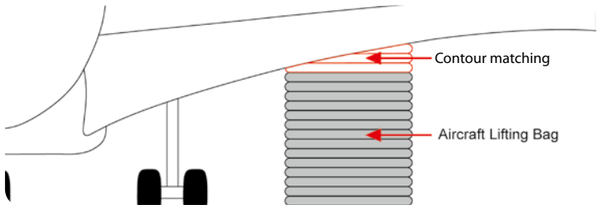
Everything is stable and gently under control
Applicable for all types of aircraft, the stable chambers meet the highest safety specifications. Applied any amount of times, they enable guaranteed straight lifting with the minimum of pressure point loading on the sensitive aircraft body and create a stable transition between the lifting bag and the aircraft. Costly secondary damage can be avoided and the full-surface contact ensures maximum load stability.

Why is contour matching essential?
According to Mr. Hofer*, contour matching results in a clear improvement in safety, especially as regards load stability with an aircraft recovery. The lifting power of the lifting bags can be used to its full extent and the danger of damage to both airplane and lifting bags is minimised.
The **Vetter** vacuum chambers are a perfect adaptation of the "straight" lifting bags to the „round" airplane.
**Former head of the Airport fire brigade Frankfurt, Fraport AG*

Left: before | right: after, vacuum drawn

Perfect match of "straight" and "round"

Sets Contour matching - consisting of:		Set 30 to *3500008601*	Set 40 to *3500008701*	Set 60 to *3500008801*
3500006301	ALB-Chamber, 0.5 bar (7.25 psi) 1,000 x 2,300 x 200 mm (40 x 91 x 8 inch)	3	6	9
3500006401	ALB-Chamber, 0.5 bar (7.25 psi) 500 x 2,300 x 200 mm (20 x 91 x 8 inch)	3	6	9
3500008201	ALB-Chamber, 0.5 bar (7.25 psi) 1,000 x 1,400 x 200 mm (40 x 55 x 80 inch)	6	15	18
3500008300	ALB-Chamber 2,300 x 1,400 x 400 mm (91 x 55 x 16 inch), VACUUM	3	4	6
3500006100	ALB-Chamber 1,000 x 2,300 mm (40 x 91 inch), VACUUM	3	4	6
0350003802	10 section ALB controller, 0.5 bar (7.25 psi), dead man	2	3	4
0351001400	Compressed-air distributor, 1.0 bar	1	1	1
0350007401	ALB compressed air hose 10 m (32 ft.), yellow, with quick-action coupling	30	45	60
0350019802	8 section ALB controller VACUUM, dead man	1	1	1
0350022500	Base plate 2,440 x 1,250 mm (96 x 49 inch)	3	4	6
0350022600	Filling sack 400 x 600 mm (16 x 24 inch), filled with Styropore	60	60	60
0350022700	Label set, numbering 1 - 25	2	2	2
0350022800	Label set, numbering 26 - 50	2	2	2
0350022900	Fold-up ladder, 12 steps	1	1	1
0350023000	Covering, 1.46 m (57 inch) folded out	1	1	1
0350032801	Filling device for contour chambers	1	1	1
0350033300	Storage container for polystyrene material	5	6	8



Would you like to receive detailed information about our contour matching systems? Request our free animated "Aircraft Recovery" CD for a demonstration. The animation shows how easy it is to use. We look forward to hearing from you!

+49 (0) 2252/3008-0 or

vetter.rescue@idexcorp.com

Technical Data*

1.0 bar / 14.5 psi

	Unit	ALB 3/100	ALB 5/120	ALB 14/160	ALB 30/245	ALB 30/305	ALB 30/380	ALB 40/305	ALB 60/400
Art.-No.-ALB-Sets		3510000800	3510000900	3510001000	3510001100	3510001200	3510001700	3510001300	3510001400
Lifting power	t US tons	6.6 7.3	11.2 12.4	28 30.9	65 71.7	65 71.7	65 71.7	87.4 96.4	132 145.6
Max. lifting height	cm inch	100 39	120 47	160 63	245 96	305 120	380 150	305 120	400 157
Bag chambers		5	6	8	14	17	21	20	25
Support area (L x W)	cm inch	98 x 68 39 x 27	140 x 80 55 x 32	200 x 140 79 x 55	284 x 229 112 x 90	284 x 229 112 x 90	284 x 229 112 x 90	426 x 205 168 x 81	426 x 310 168 x 122
Total area (L x W)	cm inch	112 x 82 44 x 32	154 x 94 61 x 37	214 x 154 84 x 61	298 x 243 117 x 96	298 x 243 117 x 96	298 x 243 117 x 96	440 x 219 173 x 86	440 x 324 173 x 128
Insertion height (deflated bag)	cm inch	7 2.8	8 3.1	10 3.9	15 6.0	20 7.9	20 7.9	20 7.9	25 9.8
Air requirement	l cu. ft.	1,722 60	3,396 120	10,618 374	32,626 1,152	40,850 1,442	49,300 1,740	58,174 2,054	118,532 4,184
Packing dimensions of the box (L x W x H)	cm inch	113 x 48 x 60 45 x 19 x 24	115 x 123 x 61 45 x 48 x 24	178 x 63 x 75 70 x 25 x 30	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	360 x 160 x 120 142 x 63 x 47
Dimensions of the packing bag (L x W x H)	cm inch	110 x 30 x 40 43 x 12 x 16	110 x 40 x 40 43 x 16 x 16	170 x 55 x 45 67 x 22 x 18	240 x 90 x 60 95 x 35 x 24	240 x 95 x 65 95 x 37 x 26	240 x 100 x 70 95 x 39 x 28	240 x 100 x 70 95 x 39 x 28	340 x 100 x 80 134 x 39 x 32
Approximate weight	kg lbs	26 57	41 90	93 205	256 564	320 706	380 838	480 1,058	840 1,852
Approximate weight of set	kg lbs	68 150	207 456	185 408	450 993	513 1,131	588 1,297	681 1,502	1,155 2,547

	Unit	ALB 1/13	ALB 1/23
Art.-No. - ALB-Sets		3510002400	3510002300
Lifting power	t US tons	6.5 7.2	11.3 12.5
Lifting power of Set	t US tons	13 14.3	22.6 24.9
Max. lifting height	cm inch	62 24	110 43
Insertion height (deflated bag)	cm inch	7 - 8 2.7 - 3.15	7 - 8 2.7 - 3.15
Diameter	cm inch	91 35.5	120 46.8
Air requirement at 1.0 bar	l cu. ft.	806 28	2,468 88
Inflation time	sec.	62	191
Approximate weight	kg lbs	12 26	21 46
Approximate weight of set	kg lbs	54.5 120.2	78 172

Aircraft Lifting Bags 1.0 bar:
Working pressure: 1.0 bar
Test pressure: 1.5 bar

* Technical datas relate to single bags.
Technical changes reserved.

Technical Data*

0.5 bar / 7.25 psi

	Unit	ALB 3/100	ALB 5/120	ALB 14/160	ALB 30/245	ALB 30/305	ALB 30/380	ALB 40/305	ALB 60/400
Art.-No.-ALB-Sets		3500000300	3500005200	3500000400	3500000500	3500000600	3500007500	3500000800	3500001000
Lifting power	t US tons	3.3 3.6	5.6 6.2	14.8 16.3	30 33.1	32.5 33.5	32.5 33.5	43.7 48.2	66 72.8
Max. lifting height	cm inch	100 39	120 47	160 63	245 96	305 120	380 150	305 120	400 157
Bag chambers		5	6	8	14	17	21	20	25
Support area (L x W)	cm inch	98 x 68 39 x 27	140 x 80 55 x 32	200 x 140 79 x 55	284 x 229 112 x 90	284 x 229 112 x 90	284 x 229 112 x 90	426 x 205 168 x 81	426 x 310 168 x 122
Total area (L x W)	cm inch	112 x 82 44 x 32	154 x 94 61 x 37	214 x 154 84 x 61	298 x 243 117 x 96	298 x 243 117 x 96	298 x 243 117 x 96	440 x 219 173 x 86	440 x 324 173 x 128
Insertion height (deflated bag)	cm inch	7 2.8	8 3.1	10 3.9	15 6.0	20 7.9	20 7.9	20 7.9	25 9.8
Air requirement	l cu, ft,	1,292 46	2,550 90	7,964 281	24,510 865	30,638 1,081	39,975 1,412	43,631 1,540	88,900 3,138
Packing dimensions of the box (L x W x H)	cm inch	113 x 48 x 60 45 x 19 x 24	115 x 123 x 61 45 x 48 x 24	178 x 63 x 75 70 x 25 x 30	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	268 x 109 x 100 106 x 43 x 39	360 x 160 x 120 142 x 62 x 47
Dimensions of the packing bag (L x W x H)	cm inch	110 x 30 x 40 43 x 12 x 16	110 x 40 x 40 43 x 16 x 16	170 x 55 x 45 67 x 22 x 18	240 x 90 x 60 95 x 35 x 24	240 x 95 x 65 95 x 37 x 26	240 x 100 x 70 95 x 39 x 28	240 x 100 x 70 95 x 39 x 28	340 x 100 x 80 134 x 39 x 32
Approximate weight	kg lbs	26 57	29 64	93 205	256 564	413 911	380 838	480 1058	840 1,852
Approximate weight of set	kg lbs	68 150	195 430	185 408	450 993	588 1,297	588 1,297	681 1,502	1,155 2,547

Aircraft Lifting Bags 0.5 bar:
Working pressure: 0.5 bar
Test pressure: 0.75 bar

* Technical datas relate to single bags.
Technical changes reserved.

Accessoires

Inflation hoses

Inflation hose with quick action coupling,
10 m (32 ft.), yellow

0350007401

Hose roller box

3500001500

Set of inflation hoses, incl. transport - and storage box

20 pieces	0351001100
30 pieces	0351001200
40 pieces	0351001300

Compressed-air hose with claw coupling
10 m (32 ft.), yellow

0350007301

Compressors & Accessoires*

Mobile compressors

Typ 7/31
0350006600

Typ 7/41
0350007100

* Technical Data on request

After cooling
for mobile compressors Typ 7/31 and 7/41

0350006700

Filter combination ZTV-SIB 90
for mobile compressors Typ 7/31 and 7/41

0350006800

Vetter offers some more accessories for Aircraft Recovery like Combination lifting tackles.
Contact us: +49 (0) 2252/3008-0 or vetter.rescue@idexcorp.com

Other

Compressed air distributor
1 inlet claw coupling, 6 shut-off outlets with quick-action coupling

0351001400

Vacuum adapter incl. noise reduction,
for deflation of Aircraft Lifting Bags

0351001500

Controllers 1.0 bar

Dead man controller, incl. transport - and storage box

10-section controller

0351000701

17-section controller, incl. 2 contour chamber controllers

0351000901

10-section controller, incl. 3 contour chamber controllers

0351000601

17-section controller, incl. 3 contour chamber controllers

0351000800

Controllers 0.5 bar

Dead man controller, incl. transport - and storage box

10-section controller

0350003801

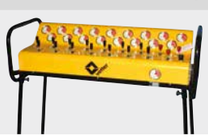
17-section controller, incl. 2 contour chamber controllers

0350024801

10-section controller, incl. 3 contour chamber controllers

0350003401

17-section controller, incl. 3 contour chamber controllers



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