Aircraft Recovery

Lifting out of Limits

IATA | Strategic Partner

Foto: Alexander Blum

„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.

** Airport fire brigade Frankfurt, Fraport AG*

Aircraft lifting bags - Safe and fast recovery

„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.

In operation ...

- damage to landing gear (e.g. defective tyres, broken main landing gear)
- for maintenance and repair work
- next to the runway or taxiway

Good reasons:

- ideal preparation for accident scenarios
- enables fast, safe recovery
- lower costs, less time-consuming
- fewer annoyed passengers due to cancelled flights and overcrowded terminals
- avoiding bad image

Guaranteed quality:

- final inspection of aircraft lifting bags
- automatic pressure monitoring of contact chambers

MADE IN GERMANY

Aircraft Lifting Bags

1 bar (14.5 psi) and 0.5 bar (7.25 psi) technology

The selection of the corresponding aircraft lifting bag depends, among others, on the following factors:

- Type of aircraft to be recovered and its position
- Recovery weight of the aircraft
- Positioning areas for the ALB surfaces
- Data specified in recovery manuals (max. skin pressure)

The divided contact chambers of the **Vetter** aircraft lifting bag enable optimum match to the aircraft positioning areas so that the pressure is optimally distributed. With a maximum insertion height of 25 cm (10 inch) and a bag surface of up to 14 m^2 the lifting bags are ideally suited to lift aircraft evenly up to 4 m/13 ft. (without any support from underneath).

Dead man controller with contour chamber control

The number of controllers and hoses to be used depends on the number of chambers in the lifting bag sets. For sets with divided contact chambers, each is regulated separately for better control of the sensitive contact with the airplane.

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.

Another essential distinctive feature is the coupling system. The lifting bags, hoses and controllers are fitted with rapid snap-in couplings enabling easy and time-saving inter-coupling of the individual elements. That makes fast and effective recovery possible.

1-bar aircraft lifting bags are up to 40% more stable

0.5 bar technology - The standard

The aircraft lifting bags 0.5 bar/7.25 psi are made of a high tear resistant PVC material. The yellow side walls as well as the reflecting vulcanized labels enable optimum visibility.

Standard 0.5 bar/7.25 psi aircraft lifting bags

Good reasons for 1 bar/14.5 psi lifting bags:

- approx. 40% more stable than the 0.5-bar technology
- snap-in couplings for increased flexibility
- easier handling thanks to lower weight

Aircraft Lifting Bags

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

ALB 30/305 0.5 bar/7.25 psi:

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

Support area and lifting height are identical for both series. The difference is the doubled nominal lifting power of the 1-bar series. In addition, the 1-bar technology provides significantly improved lateral load tolerance – which means increased stability and greater safety when lifting aircraft.

0.5 bar/7.25 psi		Max. lifting height	1 bar/14.5 psi	
ALB Sets	Nominal lift power		ALB Sets	Nominal lift power
ALB 3/100 =	33 kN (3.3 t)	100 cm/39 inch	ALB 3/100 =	66 kN (6.6 t)
ALB 5/120 =	56 kN (5.6 t)	120 cm/46.8 inch	ALB 5/120 =	112 kN (11.2 t)
ALB 14/160 =	140 kN (14 t)	160 cm/62.4 inch	ALB 14/160 =	280 kN (28 t)
ALB 30/245 =	325 kN (32.5 t)	245 cm/95.6 inch	ALB 30/245 =	650 kN (65 t)
ALB 30/305 =	325 kN (32.5 t)	305 cm/119 inch	ALB 30/305 =	650 kN (65 t)
ALB 30/380 =	325 kN (32.5 t)	380 cm/148 inch	ALB 30/380 =	650 kN (65 t)
ALB 40/305 =	437 kN (43.7 t)	305 cm/119 inch	ALB 40/305 =	874 kN (87.4 t)
ALB 60/400 =	660 kN (66 t)	400 cm/156 inch	ALB 60/400 =	1320 kN (132 t)

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) 2252/3008-60 or vetter.info@idexcorp.com

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's consultants will be happy to arrange customized recovery sets according to your needs.

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

Recently we developed the **new** 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

Contour matching

„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.

** Airport fire brigade Frankfurt, Fraport AG*

Vacuum chamber

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!

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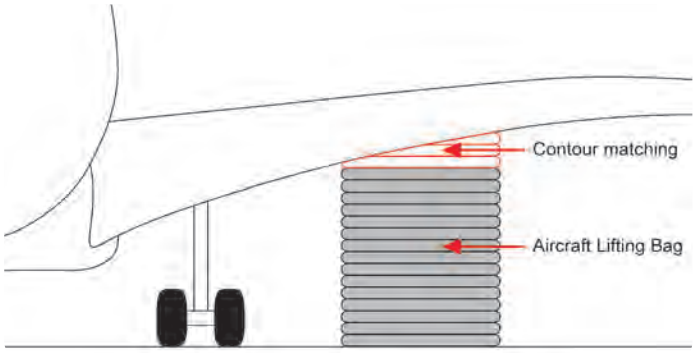
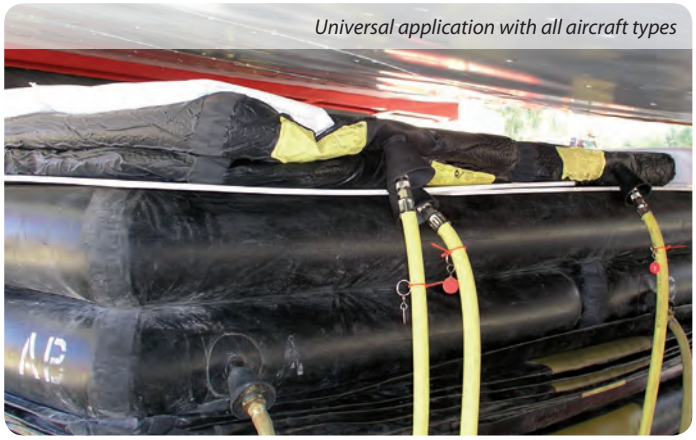


Universal application with all aircraft types



Stable transition between lifting bag and aircraft

Perfect match of "straight" and "round"

Recovery equipment
and accessories

„Scobamat*“ - Ground reinforcement mats

Airplanes on soft ground can subside when they stray afield the runway. Scobamat is the fast and reliable way to get them back on the runway.

The fibre-glass reinforced structured ground mats are used to cover soft or uneven ground during rescue or salvage operation on difficult terrain. Scobamat design prevents mat rolling and is suitable for large aircrafts (e.g. the new A 380).

Characteristics:

- Easy handling, portable
- Lightweight (about 48 kg / 106 lbs each sheet)
- Enormous load resistant (220 t/m²)
- No special tools required
- Stacks flat for easy storage
- Sanded surface for enhanced grip
- Oil and petrol resistant
- Reliable use – proven worldwide

** Tradename of Scobalit AG CH-8405 Winterthur*

„Scobamat“ - Ground reinforcement mats*

Towing sling systems

Vetter also offers towing sling systems for recovery of aircraft that are still “runway-capable“.

Towing slings for moving aircraft

Tethering winch with ground anchor

Tethering winches can be used for problem-free stabilisation of an aircraft during recovery, for instance to protect against gusts of wind.

Tensioning

Hand-operated tethering winch

Ground anchor

Recovery equipment

and accessories

If the nose gear has been damaged, the nose of the aircraft can be lifted using a **combination spreader bar/lifting harness**.

Kombitraverse KAT I/II

Braces and lifting harnesses for several sizes of aircrafts

The lifting harnesses, divided into three categories, make it possible to recover different types of aircraft, e.g. after a landing gear failure. It consists of lifting straps, loop straps and various braces.

Combination spreader bar CAT I and II

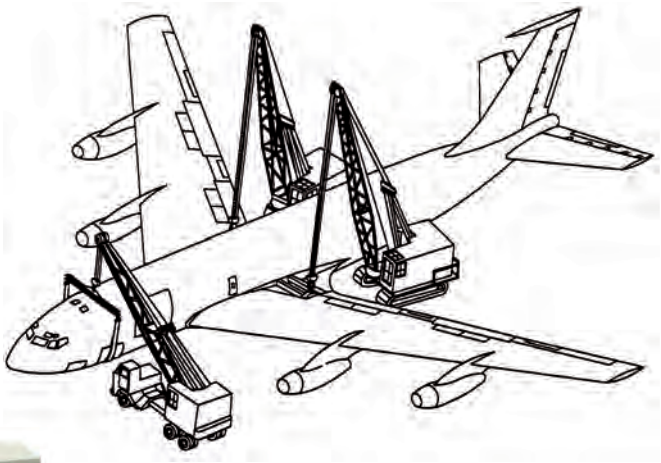
With the combination spreader bar CAT I/II aircraft up to a recovery weight of 12,000 kg / 26,460 lbs (e.g. Learjet, Cessna) can be recovered. In doing this, adjustable transverse braces are used in connection with the girder brace.

With sole use of the girder brace the function radius of the combination spreader bar is extended to aircraft with a fuselage circumference of 8 - 12 m / 26 - 38 ft. (e.g. B 737, B 757).

Hebetraverse KAT III

Lifting brace CAT III

A complete recovery/lifting device for lifting aircraft up to a recovery weight of 24,000 kg / 52,920 lbs and with a fuselage circumference of 15 - 23 m / 48 - 74 ft. (e.g. B 747, A 340).



In addition to the braces, Vetter also offers lifting strap systems!

Additional accessories on request, like:

- Various sorts of lifting straps
- Tension device
- Towing slings
- Tension measurement gauges
- Compressors

Example

Place your trust in emergency pneumatics!

We are the company who can help you, find a solution to your problem!.

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