

What is the easy way for a user to become a producer?

The unauthorised replacement of parts and machinery conversions may have far-reaching consequences.



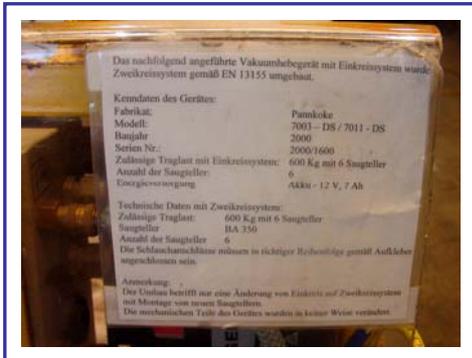
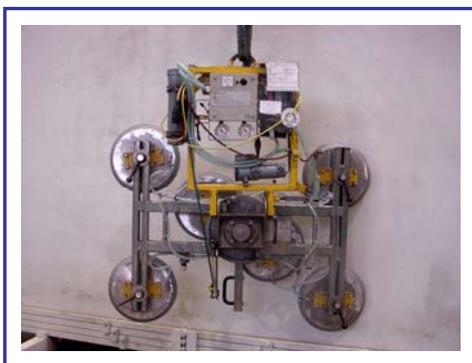
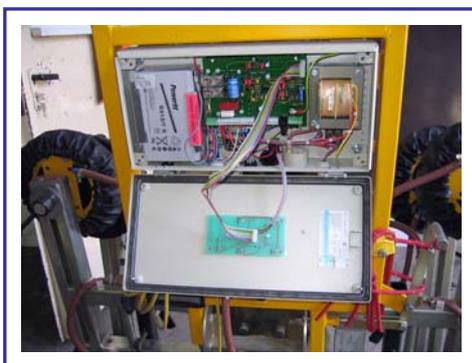
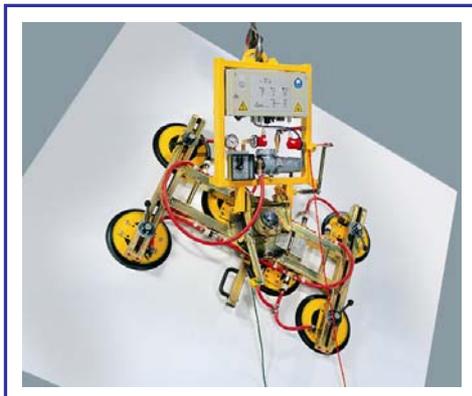
It's a common problem. The pressure of rising costs is felt everywhere. People are saving wherever they can. However, the consequences of saving when it comes to machinery safety and guaranteed machine characteristics quickly results in far-reaching consequences within the EU.

This point is quickly reached with vacuum lifting devices. This is because, although suction cups on the market look almost the same, at least externally, and may have the same geometric dimensions, they may not necessarily have the same load-carrying capacity. Tests performed at the University of Kiel in the past few years show that they may be deviations of 25% given the same geometric dimensions.

This fact shows that the load-carrying capacity of a vacuum lifting device may be reduced by a quarter by simply replacing the suction cups. This represents a considerable change in device characteristics. Anyone who makes a modification of this kind becomes a producer and must therefore go through all the steps to obtain the necessary CE mark himself. This starts with the nameplate and risk analysis through to producing the operating instructions. Only when all these steps have been completed may the device bear a CE mark again and be operated within the EU.

If these steps are not complied with, an unsafe vacuum lifting device will be in operation within the EU with all its consequences. In other words, the penalty to pay in the event of an accident is for gross negligence. The managing director or business owner should therefore seek advice on this matter from a competent authority.

For this reason, the ultimate conclusion is: there should be no unauthorised tampering with device characteristics. Any changes should be left to the specialist manufacturer of the vacuum lifting device.

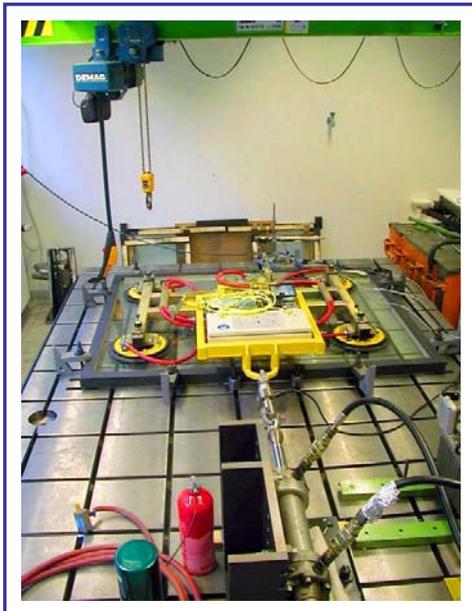


If you contract the conversion of a vacuum lifting device to an outside company, you must make it a rule to check whether the main characteristics, especially safety-related features, have been changed. If they have, the converting company becomes a producer of the vacuum lifting device. It is then necessary to deliver the vacuum lifting device with a new nameplate, a new Declaration of Conformity, a CE mark and the operating instructions. If this fails to happen, it makes the body of evidence regarding whether the device used is a safe vacuum lifting device, more difficult in the event of damage. This is because the operator is also responsible for device safety in the EU.

We would like to illustrate this problem by means of a vacuum lifting device returned to us. The original product made by Pannkoke Flachglastechnik GmbH, a Kombi 7011-DS, was brought into circulation in 2000. At that time, as usual, it was a vacuum lifting device with a single vacuum circuit. It was equipped with 6 388-type suction cups and was capable of holding 600 kg with double safety in the load test, i.e. the device could lift a total load of 1200 kg without the load slipping. As required, a vacuum tank with non-return valve was provided. The charger, rechargeable battery and the entire control system comprising the indicators were housed in the switch box. A visual and acoustic alert signal was activated if the vacuum dropped below a certain level.

This vacuum lifting device was converted into a 2-circuit system by an outside company. It was supposed to comply with safety standard EN 13155, as stated on the sticker affixed to the device. The control system was removed from the original vacuum lifting device, the vacuum cups were replaced and everything was changed except for the original steel frame, i.e. the device was totally new with a completely different operation and function.

Prescribed vacuum tanks are difficult to find, and whether a commercially available charger behind a Plexiglas cover provides the user with the required safety is not the subject of discussion here.



The core of safety standard EN 13155, and therefore the main point under discussion, is the load-bearing capacity of the vacuum lifting device. In fact, the safety standard has significantly tightened machinery requirements in the construction industry. The core issue should therefore be: are the six replaced suction cups at all capable of guaranteeing the requirements of EN 13155? The vacuum lifting device is a 2-circuit device and should be capable of holding the rated load with one circuit if one of the two safety circuits fails. The suction cup diameter is slightly larger (350 mm instead of 290 mm), but can a single suction cup hold **1200 kg : 3 = 400 kg** (vertically)?

Why 1200 kg? Because

3 suction cups are assigned to one vacuum circuit and double safety is a requirement here.

The suction cup diameter is 350 mm, producing a surface area of 962 cm². The working range of the device starts with a vacuum of -0.6 bar. At a coefficient of friction of 0.5, the suction cup has a load-bearing capacity of 288.6 kg. For three suction cups, this is therefore 865.8 kg, not 1200 kg. The coefficient of friction is given in the literature as 0.5 and is not the invention of Pannkoke. This calculation was verified in a load test. The result with new suction cups is better than the calculated value, but the required 400 kg were not achieved.

Apart from the question of the load-bearing capacity of the suction cups used and the lack of vacuum tank, the new producer of the vacuum lifting device failed to supply the converted device with operating instructions or with a nameplate, and therefore there is no valid CE mark.



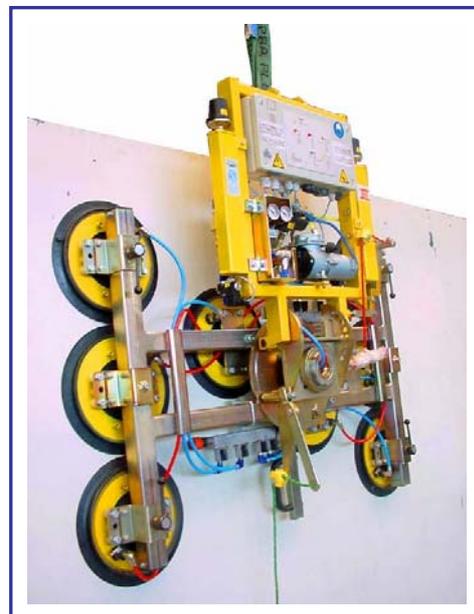
In our example, the converted vacuum lifting device was supplied to the operator with the original operating instructions of Pannkoke Flachglastechnik GmbH and a supplementary document stating only that the vacuum lifting device had been converted. There was no further information. No matter what the function of the vacuum lifting device is, the vacuum lifting device must be classified as unsafe since the operating instructions are missing. Not to mention the highly reduced load-bearing capacity of the suction cups used. Whoever uses such a converted device is acting with gross negligence in terms of the law.

This was the only document:

<p>Firma</p> <p>DEUTSCHLAND</p> <p style="text-align: right;">2004</p> <p style="text-align: center;">Bescheinigung</p> <p>Betr.: Umbau des Vakuumhebeggeräts von Einkreis - auf Zweikreisystem</p> <p>Das nachfolgend angeführte Vakuumhebeggerät mit Einkreisystem wurde auf Zweikreisystem gemäß EN 13155 umgebaut.</p> <p>Kerndaten des Gerätes:</p> <table> <tr> <td>Fabrikat:</td> <td>Pannkoke</td> </tr> <tr> <td>Modell:</td> <td>7003 - DS / 7011 - DS</td> </tr> <tr> <td>Baujahr:</td> <td>2000</td> </tr> <tr> <td>Serien Nr.:</td> <td>2000/1600</td> </tr> <tr> <td>Zulässige Traglast mit Einkreisystem:</td> <td>600 Kg mit 6 Saugteller</td> </tr> <tr> <td>Anzahl der Saugteller:</td> <td>6</td> </tr> <tr> <td>Energieversorgung:</td> <td>Akku - 12 V, 7 Ah</td> </tr> </table> <p>Technische Daten mit Zweikreisystem:</p> <table> <tr> <td>Zulässige Traglast:</td> <td>600 Kg mit 6 Saugteller</td> </tr> <tr> <td>Saugteller</td> <td>BA 350</td> </tr> <tr> <td>Anzahl der Saugteller</td> <td>6</td> </tr> </table> <p>Die Schlauchanschlüsse müssen in richtiger Reihenfolge gemäß Aufkleber angeschlossen sein.</p> <p>Anmerkung: Der Umbau betrifft nur eine Änderung von Einkreis auf Zweikreisystem mit Montage von neuen Saugtellern. Die mechanischen Teile des Gerätes wurden in keiner Weise verändert!</p>	Fabrikat:	Pannkoke	Modell:	7003 - DS / 7011 - DS	Baujahr:	2000	Serien Nr.:	2000/1600	Zulässige Traglast mit Einkreisystem:	600 Kg mit 6 Saugteller	Anzahl der Saugteller:	6	Energieversorgung:	Akku - 12 V, 7 Ah	Zulässige Traglast:	600 Kg mit 6 Saugteller	Saugteller	BA 350	Anzahl der Saugteller	6	
Fabrikat:	Pannkoke																				
Modell:	7003 - DS / 7011 - DS																				
Baujahr:	2000																				
Serien Nr.:	2000/1600																				
Zulässige Traglast mit Einkreisystem:	600 Kg mit 6 Saugteller																				
Anzahl der Saugteller:	6																				
Energieversorgung:	Akku - 12 V, 7 Ah																				
Zulässige Traglast:	600 Kg mit 6 Saugteller																				
Saugteller	BA 350																				
Anzahl der Saugteller	6																				



If we convert a 1-circuit vacuum lifting unit which we manufactured into a 2-circuit device, it receives a maximum of 8 suction cups and the load-bearing capacity is lowered to 400 kg on construction sites. Prior to any conversion, the device is subjected to a thorough test. After conversion, the vacuum lifting device is returned to the test stand and each vacuum circuit must be capable of bearing double the rated load in the form of steel plates.



The safety standard EN 13155 has been in effect since January 1, 2004 and represents the current state of the art as well as the minimum requirements. Whatever the solution, it must offer the necessary safety of a device with at least two vacuum circuits when used on construction sites. It is also important for **each vacuum circuit** to be capable of achieving **a rated load at twice the safety**. The standardisation committee assumes that a vacuum circuit could fail and the other vacuum circuit should then be capable of holding the load safely.

Irrespective of the fact that a conversion is performed correctly or incorrectly, it causes a significant change in device characteristics since the operation, safety facilities and much more no longer correspond to the original device. In practice, a new device has been produced and this requires compliance with all the steps leading to CE conformity.



Please verify your deliveries, since you as operator are obliged to make sure that the devices you put into operation are safe and meet the statutory regulations.

The testing of vacuum lifting devices also belongs to the competence of specialists who deal with vacuum lifting devices on a daily basis and who know the requirements regarding vacuum lifting device. The stamp of a crane company may be cheaper but has little to do with the concept of safety. The device in our example was also tested by a crane service and was found to be in order. As we have shown, this is not the case. It is a matter of safety, the safety of your employees and all others who are located on and around the construction site. For this reason, we always subject the suction cups to load-bearing capacity tests during inspections. You can only obtain this degree of safety from a specialist since it is impossible to judge the actual load-bearing capacity by just looking at a suction cup.

Author:
Dipl.-Ing. Bernd Pannkoke
Pannkoke Flachglastechnik GmbH

