

Test results

**Carrying Capacity of Vacuum Lifting Devices
Pannkoke Kombi 7011-ADS
Wood's Powr-Grip P11104DC**

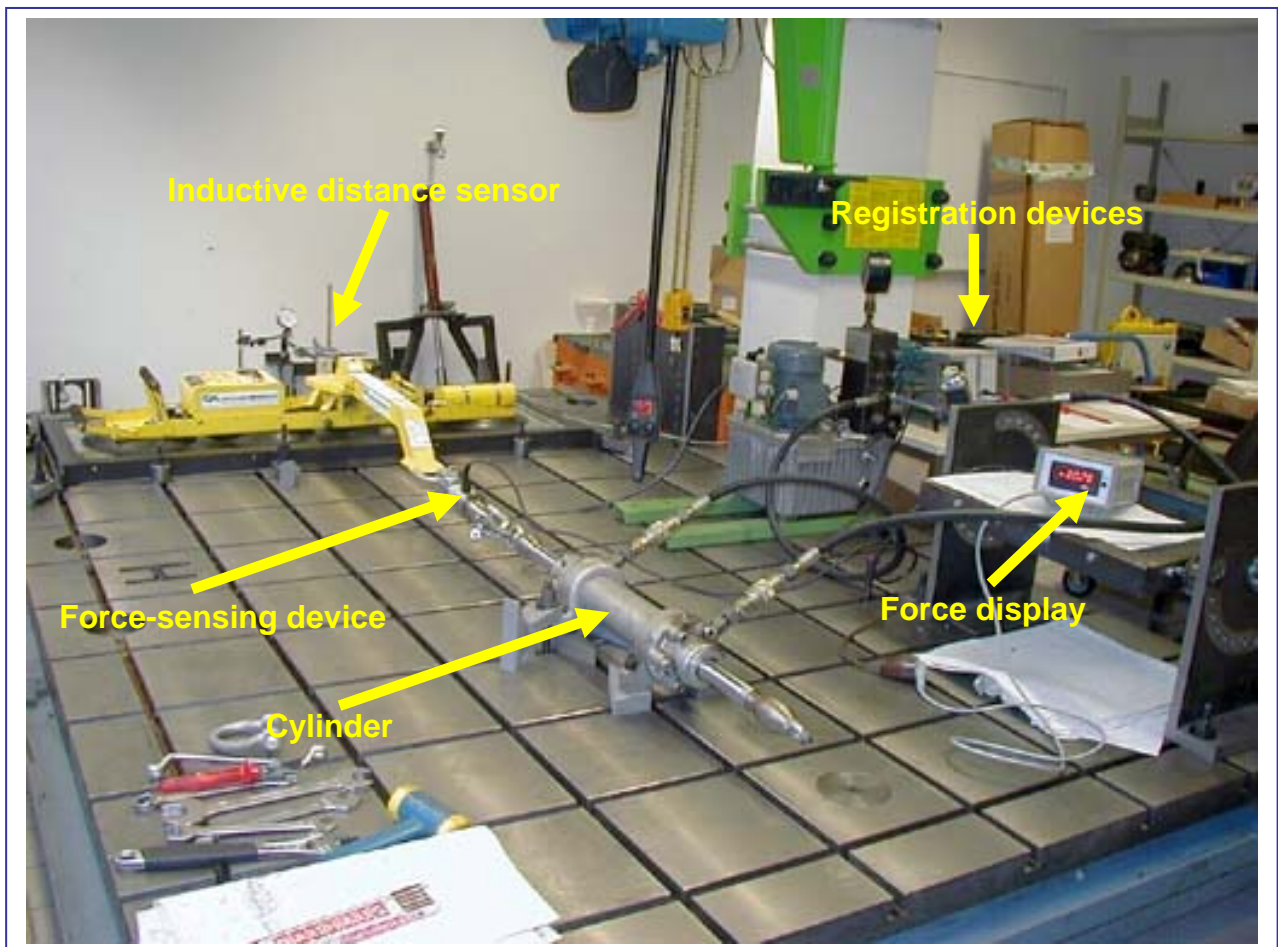
**An investigation by the Fachhochschule Kiel
(executed in the first half year 2003 / 2004)**

conducted by Professor Dr.-Ing. Michael Klausner

Execution of the trial

The device was subjected to a hydraulic cylinder with constant tensile force. The tensile force as well as any lost distance in case of slipping were measured. The tensile direction was effected by lengthening the device axis and moving it perpendicularly.

Figure 1 shows the test setup for vacuum lifting device Wood's Powr-Grip P11104DC.



Picture 1: Test construction for determination of the parallel tensile force. The force functions here perpendicularly to the device axis. Device: Wood's Powr-Grip P11104DC.

The vacuum (0.6 – 0.7 bar) provided by the device was applied.

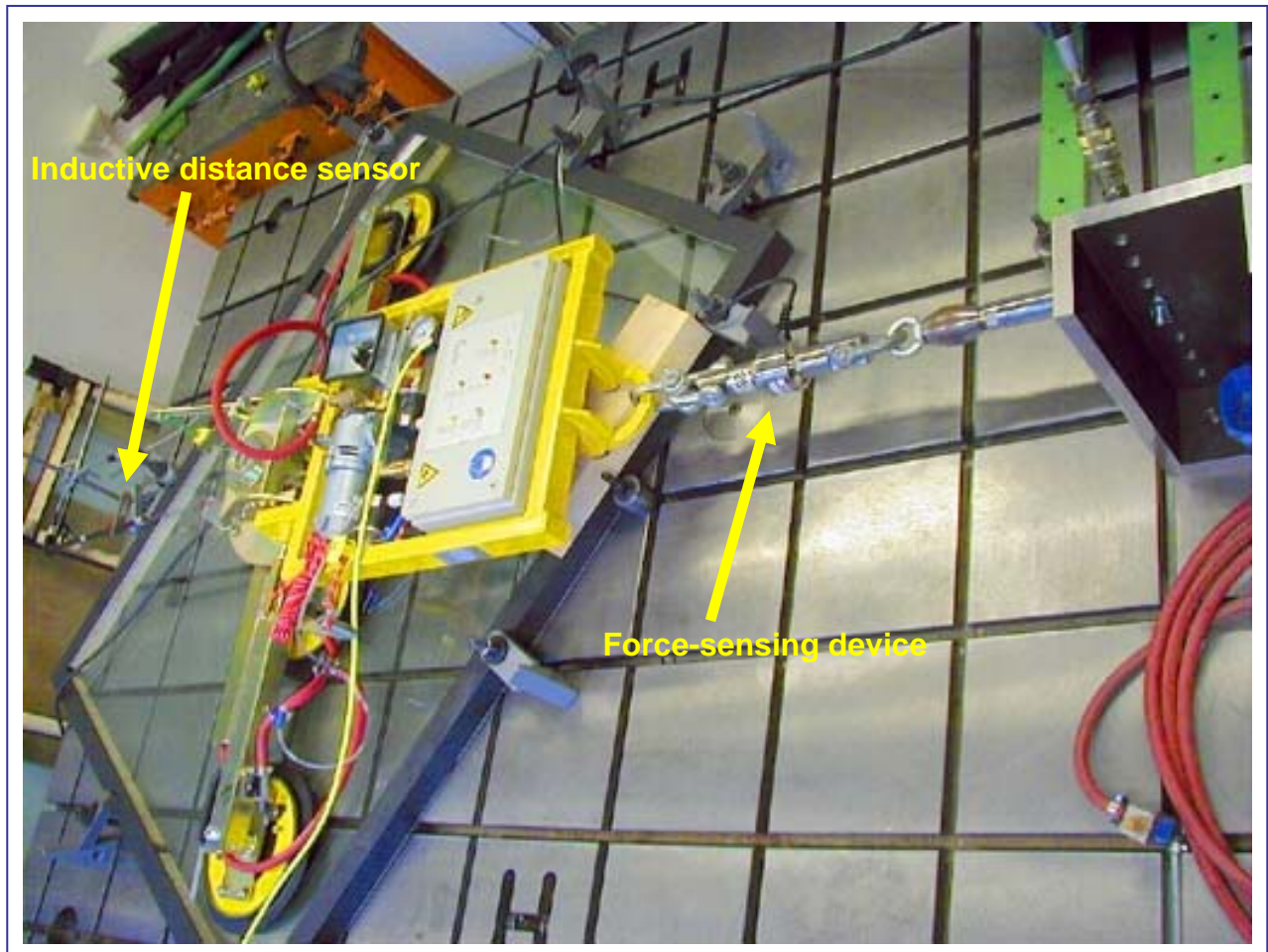
The following load values were determined (vertical direction) for Wood's Powr-Grip P11104DC:

6 kN	no slipping
7 kN	0.1 mm / 10 min
10 kN	clear slipping

The following measured values were determined by loading the device axis (longitudinal direction) for Wood's Powr-Grip P11104DC:

8 kN	no slipping
10 kN	0.1 mm / min
12.5 kN	clear slipping

The ADS-Device was tested on a larger glass plate of identical quality as seen in picture 2.



Picture 2: Test construction for Kombi 7011-ADS, Messrs. Pannkoke Flachglastechnik GmbH

The vacuum (0.6 – 0.7 bar) provided by the device was applied.

he following load values were determined (vertical direction) for Pannkoke Kombi 7011-ADS:

9.0 kN	no slipping
10.0 kN	no slipping
12.0 kN	clear slipping

The following measured values were determined by loading the device axis (longitudinal direction) for Pannkoke Kombi 7011-ADS:

9.0 kN	no slipping
10.5 kN	0.04 mm / min
13.5 kN	clear slipping

It was determined that the Woods device started running approximately every 3 minutes in order to regenerate the vacuum; compared with the Kombi 7011-ADS which continuously maintained the vacuum 105 min without renewing pressure.

Kiel, 21.8.2004
Prof. Dr.-Ing. Michael Klausner