Y-B. HAM, B-J. LIM, J-H. NOH, J-H. PARK. ***Suction force of blowing fan on various surface shapes of outer wall.*** *Gerontechnology 2012;11(2):322;* doi:10.4017/gt.2012.11.02.495.00 **Purpose** The outer walls of high-rise buildings contain many grooves of irregular shapes and sizes. Conventionally, gondola systems on platforms are used to carry the workers who conduct maintenance work on the outer walls of high-rise buildings. It is very difficult to perform such works on outer walls using a gondola due to external disturbances such as squalls. Therefore we propose a stable attachment for a grooved wall surface; with an air suction force of a fan it is possible to generate enough force to attach onto the wall surface[1-5]. In this paper, a test apparatus was developed to measure the attaching force of a suction fan according to fan speed. Also, the suction forces were measured according to four types of wall surfaces. **Method** A test rig for suction force was developed to measure the attaching force of the suction fan. Using this test rig, four kinds of specimens were compared by measuring the attaching force. The test rig consisted of a pneumatic cylinder, a load-cell, and a rotating speed meter. Four different vertical walls surfaces were made: flat, step, rib and embossing type surfaces. The suction fan housing was fixed by a frame when the fan rotated. The wall specimen was moved by a pneumatic cylinder, and then the separation force was measured using a load cell. For each of the vertical wall types the attaching force of the suction fan was measured at varying the rotation speeds. **Results**The maximum attachment force of the suction fan was 3.2 times higher on the flat surface than on the step surface at 700 rpm, 1.3 times higher on the embossed surface at 1400 rpm, and 1.3 times higher on both flat and rib surface at 1800 rpm. The maximum attachment force increased linearly according to the motor rotating speed. These results clearly show that the attachment performance of the fan is considerably less influenced by the groove of surface than by increases in the fan rotation speed.

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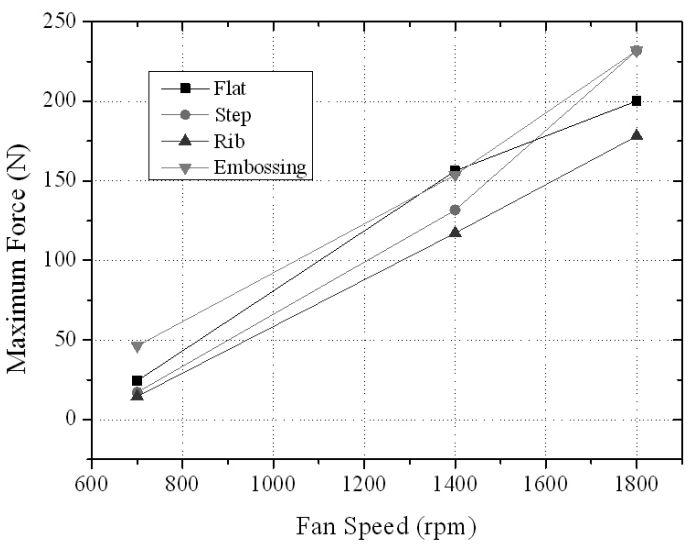

Figure 1. Relationships between maximum suction force and fan speed.