

TEST OBJECTIVE: To determine the forces involved in moving a mass horizontally across a seat surface and to extend the measurements to the Vista Medical Shear force sensor range.

PROCEDURE: We added mass to a fixed area (33.18sq cm). We rested the weight on a piece of rip-stop nylon material that was laid on a pressure mat covered in the identical nylon. The pressure mat was fixed to a horizontal surface and we monitored the downward pressure of the mass.

We then pulled the material on which the mass rested using a spring gauge. By varying the weight of the mass we determined the varying forces required.

RESULTS:

Mass (grams)	Pressure (mmHg)	Force (Newtons)
400	7	2.2
600	12	3.3
800	17	4.7
1000	22	6.6
2000	44	9.8
3000	66	15.1
4550	100	22.2

APPLICATION: The purpose of this test was to ascertain the forces involved when using our company's shear sensor, especially around the 100mmHg range.

It takes 22.2N of tangential force to move a mass with an area of 33.18sq cm that is exerting a pressure of 100mmHg. The central disc of the shear sensor has an area of 0.71sq cm. Therefore the equivalent force in our sensor is as follows:

$$(22.2\text{N} / 33.18\text{sq cm}) 0.71\text{sq cm} = 0.47\text{N}$$

CONCLUSION: Thus, under a pressure of 100mmHg (~2psi) it takes a tangential force of 0.47 Newtons to move the shear sensor's disc.

Note: The Vista Medical Shear Sensors are calibrated to 1.5N