

## Shear strength measurement by a vane shear tester and a shear frame of natural snow

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In Eastern Hokkaido depth hoar often and cause danger of avalanche due to its weak strength.

To measure the shear strength of snow layer, a shear frame was usually used. To make the measurement convenient, several types of vane shear tester were used and compared with a shear frame.

The used vane shear tester were

1. Vane1 (vertical rotating, D=100mm, H=40mm)
  2. Vane3 (vertical rotating, D=60mm, H=40mm)
  3. Vane4 (horizontal rotating, D=60mm, H=90mm)
  4. Vane5 (vertical rotating, D=80mm, H=40mm)
  5. Vane6 (vertical rotating, trapezoid, D=80mm, H=40mm)
  6. Vane7 (vertical rotating, D=90mm, H=60mm)
  7. Vane8 (vertical rotating, trapezoid with ring, D=80mm, H=40mm)
  8. Vane9 (vertical rotating with ring, D=80mm, H=40mm)
  9. Vane10 (vertical rotating, D=85mm, H=10mm)
  10. Vane11 (vertical rotating, D=65mm, H=10mm)
  11. Shear frame
  12. Push gauge
- (D=Length, H=height)

Generally the shear strength by a vane shear tester was smaller than that of a shear frame.

The reason is that the effective snow section for shear movement is smaller than that of a shear frame.

By a correction of effective snow section area, the shear strength measurement can be done in a short time.