
Standard Method of Test for Field Vane Shear Test in Cohesive Soil

AASHTO Designation: T 223-96 (2017)

**Technical Subcommittee: 1b, Geotechnical Exploration,
Instrumentation, Stabilization, and Field Testing**

Release: Group 3 (July)



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1. SCOPE

- 1.1. This method covers the field vane test in soft, saturated, cohesive soils. Knowledge of the nature of the soil in which each vane test is to be made is necessary for assessment of the applicability and interpretation of the test.
- 1.2. The values stated in SI units are to be regarded as the standard.

2. SUMMARY OF METHOD

- 2.1. The vane shear test basically consists of placing a four-bladed vane in the undisturbed soil and rotating it from the surface to determine the torsional force required to cause a cylindrical surface to be sheared by the vane; this force is then converted to a unit shearing resistance of the cylindrical surface. It is of basic importance that the friction of the vane rod and instrument be accounted for; otherwise, the friction would be improperly recorded as soil strength. Friction measurements under no-load conditions (such as the use of a blank stem in place of the vanes, or a vane that allows some free rotation of the rod prior to loading) are satisfactory only provided that the torque is applied by a balanced moment that does not result in a side thrust. As torsional forces become greater during a test, a side thrust in the instrument will result in an increase in friction that is not accounted for by initial no-load readings. Instruments involving side thrust are not recommended. The vane rod may be of sufficient rigidity that it does not twist under full-load conditions; otherwise, a correction must be made for plotting torque-rotation curves.

3. APPARATUS

- 3.1. The vane shall consist of a four-bladed vane, as illustrated in Figure 1. Vane dimensions shall be as specified in Table 1. Sizes other than those specified in Table 1 shall be used only with the permission of the engineer in charge of the boring program. The ends of the vane may be tapered (Figure 1). The penetrating edge of the vane blade shall be sharpened having an included angle of 90 degrees.
- 3.2. The vane shall be connected to the surface by means of steel torque rods. These rods shall have sufficient diameter such that their elastic limit is not exceeded when the vane is stressed to its capacity (Note 1). They shall be so coupled that the shoulders of the male and female ends shall meet to prevent any possibility of the coupling tightening when the torque is applied during the test. If a vane housing is used, the torque rods shall be equipped with well-lubricated bearings where they pass through the housing. These bearings shall be provided with seals to prevent soil from entering them.