Designation: B615 – 79 (Reapproved 2006)

Standard Practice for Measuring Electrical Contact Noise in Sliding Electrical Contacts[1]

This standard is issued under the fixed designation B615; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice describes the practices and factors considered to be most important in the measurement of electrical contact noise of sliding contacts.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 *Definitions:*

2.1.1 *contact noise*, *n*—the varying voltage across a pair of electric contacts due to conditions at their interface. It is to be distinguished from the variation of signal due to its transmission through electrical conductors (that is, induced voltages due to adjacent sources). It is also to be distinguished from acoustic noise which may be generated by the contact action.

2.1.1.1 *Discussion*—Stepwise change of resistance of a wirewound potentiometer due to the definite resistance of a single turn is not electrical contact noise.

2.1.2 *switching or edge noise*, *n*—the electrical contact noise occurring during the period of transition from conduction to non-conduction (or vice versa) of a switching device.

3. Significance and Use

3.1 Resistance or voltage values alone do not provide sufficient detail for an engineering evaluation of contact noise. This practice lists the test conditions that should be reported with noise measurements and indicates some conditions (open circuit voltages, currents, etc.) that have been used for quality control and research studies. The use of these practices should provide sufficient detail for an engineering interpretation of the noise data and allow the tests to be repeated by another laboratory.

4. Types of Testing

4.1 *Type I*—Qualification and acceptance testing of electromechanical devices when low electrical contact noise is important for proper functioning.

4.1.1 Electrical and mechanical parameters should closely simulate the end use of the device.

4.1.2 Since the procedure is used as a method of quality control, the test parameters must be duplicated each time the test is conducted.

4.2 *Type II*—Measurement of contact voltage variation as a method of studying tribological phenomena.

4.2.1 Tests are designed with specific diagnostic or research goals.

4.2.2 Electrical and mechanical parameters are based on considerations of basic contact physics and not the engineering requirements of the device. Selected parameters may be varied as part of the test. For example, rotational rate of a slip ring may be varied to determine the surface velocity at which hydrodynamic lift becomes important.

5. Test Conditions

5.1 The following test conditions should be controlled or known to enable adequate evaluation of test results:

5.1.1 *Electrical Parameters*:

5.1.1.1 *Current*—Contact current and waveform should be specified. The limitations of the instrument(s) being used to measure the noise and adequacy of shielding from extraneous noise sources must be considered when current level is chosen. Type I tests may be made either at current levels chosen to simulate those required in actual use or may be at higher current levels in order to enhance test sensitivity provided any such higher current magnitude shall be agreed upon between the device user and producer (Note 1).

5.1.1.2 *Source Voltage*—The maximum open-circuit voltage (to the contacts) and the impedance of the source should be specified. In Type I tests, the open-circuit voltage levels chosen should simulate those required in actual use and may be at

[1] This practice is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.11 on Electrical Contact Test Methods.

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