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Proposed amended Annex A -Barnes International Ltd 24/04/04

Annex A (Informative)

Effects of wear on Test Heads and the use of Wear Resistant Test Heads

The purpose of this informative annex is to provide information for maintenance of test heads and the use of wear resistant test heads in magnetic stripe test equipment (ref clause 5.2.2.2 in this Specification).

The radius and geometry of the test head as defined in this standard is critical to calibration of the test head for conformance testing. Test heads tend to develop a “flat-spot” as the equipment is used over time. The flat spot will affect test results. Thus, it is imperative that test heads be maintained or replaced on a regular basis depending on the frequency of use. The flat spot will grow to some stage at which the test results can no longer be relied on for compliance testing. It is important that test equipment users monitor the flat spot wear to determine when the test heads should be reworked or replaced.

Higher volume test applications may present a problem of frequently changing test heads, due to test head wear. One strategy for dealing with this is to use test heads with a wear resistant coating. Wear resistant test heads currently in use for this purpose usually have a basic construction conforming to this Standard BUT DIFFER FROM THIS STANDARD only by the addition of a very thin non-magnetic (usually ceramic) coating on the head face that contacts the magnetic stripe. This coating must not cover the vital test head gap area; a zone around 1mm wide is usually left free of coating in this area so that there is no spacing loss due to head/media separation. Usually the lamination profile is altered slightly to properly receive the coating. Thus the geometry of the head is changed from that defined in this Standard. The major unwanted effect is that small secondary magnetic discontinuities are created at the edges of the wear resistant coating and these result in small magnetic performance deviations compared to uncoated test heads constructed in full conformance with this Standard. (Note that other constructions of wear resistant heads where the basic test head construction does not conform to this standard or where the coating actually causes separation of the head laminations from the magnetic stripe are considered totally unacceptable and should never be used for test purposes).

The small secondary magnetic discontinuities affect signal amplitude measurements; the effect is more noticeable on Loco material than Hico material. The level of measurement difference is not accurately predictable over a range of materials but is usually less than 4%UR and less than 1%Ui6/UA6 on normal magnetic materials (ie long

established brown/black uncoloured materials). Thicker than normal magnetic layers or thicker than normal non magnetic overlays (eg some coloured magnetic stripes use this construction) will increase these measurement differences –Loco materials may exhibit typically up to 8%UA1 measurement differences; such differences for Hico materials are usually not increased, ie again, much more difference is noted on Loco materials than Hico materials.

(Note that the above measurement difference values are indicative only. If accurate quantification of such differences are required for any particular media type then this must be obtained by comparing test results from separate tests using both uncoated and wear resistant coated test heads).

Hence, because of these uncertainties and differences the use of wear resistant or ceramic coated heads for testing to achieve measurements which may be presented as being in conformance to this Standard is prohibited.

However, usually higher volume testing is done to monitor changes during processing of one type of media in production environments. This is commonly referred to as “quality control”, for example process control activities. Using wear resistant ceramic coated heads for “quality control” will significantly minimize variability of test results due to head wear and maximize the intervals between calibration, test head inspection and test head replacements. The absolute value of the magnetic characteristics is less important than a change in the characteristics during the production process. Therefore, the use of ceramic coated heads is acceptable for “quality control”, provided the data is not presented as evidence of conformance to the base standards, ISO/IEC 7811-2,-6,-7 and ISO/IEC 10547-2.

To ensure that such data is not misinterpreted, it is recommended that such data should be tagged:

These data were measured using wear resistant, or ceramic, coated test heads and shall not be used for ISO/IEC 7811 -2,-6, -7 and ISO/IEC 15457-2 conformance data.

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