

Reference number of document: ISO/IEC JTC1/SC17/WG1 N **1334**

Date: 2004-03-30

Committee identification: ISO/IEC JTC1/SC17/WG1

Secretariat: Steve Brunt [steve.brunt@physics.org](mailto:steve.brunt@physics.org) for BSI

**Title : Proposed ISO/IEC 10373-2 annex on the use of test heads with wear resistant coatings**

**Author/Submitter : Joe Naujokas**

**Requested action : send comments to S Brunt by email**

Document type: WG1 Committee Document

Document subtype: N/A

Document stage: N/A

Document language: E

## 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 mag stripe test equipment described in Clause 5.5.2. Wear resistant coatings is *not allowed for mag stripe conformance testing, Ref ISO/IEC 10373-2, Clause 5.2.*

The radius and geometry of the test head as defined in Figure 2 of 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.

High volume test applications may present a problem of frequently changing test heads. One strategy for dealing with this is to use of test heads with a wear resistant coating. A wear resistant test head (WRTH) usually is made up of laminations (conforming to Figure 12 of this standard) that have a very thin non-magnetic, ceramic coating on the edge that contacts the mag stripe. Sometimes the laminations are altered slightly to properly receive the coating. This results in two changes to the test head laminations:

1. The geometry of the head is changed from the specification.
2. The non magnetic coating creates a space between the mag stripe media and the test head.

Both factors will affect test results. The major factor is the space created between the head gap and the magnetic material which is commonly referred to as “spacing loss”. Spacing loss effects increase rapidly in a non-linear manner. Thus, the effect of the “ceramic space” on coated mag stripes is much greater than on non coated stripes and will vary with varying coating thickness. This makes it extremely difficult to calibrate ceramic coated heads using a reference card which is not coated, for cards with coated stripes. Hence, this standard prohibits the use of wear resistant or ceramic coated heads for conformance testing.

However, usually high 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”. Using ceramic coated heads for “quality control” will minimize the variability of head wear on test results. 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 be tagged:

These data were measured using wear resistant, or ceramic, coated test heads and shall not be used for ISO/IEC 10373-2,-6 and ISO/IEC 15457-2 conformance data.

The user is cautioned that this technique is not appropriate for environments in which there is a mixture of non-coated and variable thickness coated mag stripes. These physical characteristics alone will cause variability in test results which may or may not be an indicator of a quality control problem.