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Dental materials — Guidance on testing of wear —

Part 2:
Wear by two- and/or three body contact

Produits dentaires — Lignes directrices sur les essais de résistance à l'usure —

Partie 2: Usure par contact entre deux et/ou trois corps

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

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An ISO/PAS or ISO/TS is reviewed after three years with a view to deciding whether it should be confirmed for a further three years, revised to become an International Standard, or withdrawn. In the case of a confirmed ISO/PAS or ISO/TS, it is reviewed again after six years at which time it has to be either transposed into an International Standard or withdrawn.

Attention is drawn to the possibility that some of the elements of this part of ISO TS 14569 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 14569-2 was prepared by Technical Committee ISO/TC 106, *Dentistry*, Subcommittee SC 2, *Prosthodontic materials*.

ISO/TS 14569 consists of the following parts, under the general title *Dental materials — Guidance on testing of wear*:

— *Part 1: Wear by toothbrushing*

— *Part 2: Wear by two- and/or three body contact*

Introduction

It is well understood that the wear mechanisms in the mouth are very complex. In addition they may differ from one individual to another. Therefore it appears impossible to reproduce these varying conditions by a single wear test.

As a consequence many wear tests have been proposed in dental science. Most of them consider mainly one specific aspect of the different mechanisms, some of them even claim to be able to characterize the wear resistance of dental materials completely. However, these procedures are not really comparable because of the different wear mechanisms considered, and no generally accepted method exists.

Therefore, it makes sense to utilize laboratory tests, investigating separately the various wear aspects arising under clinical conditions. They may determine the wear only for those clinical situations in which the same wear mechanism dominates, but it might be possible to predict the complete clinical wear by a number of different test methods.

In this second part of ISO/TS 14569, the wear by occlusal contact of antagonistic teeth is considered. The intention of this part is to collect and describe the various existing laboratory tests and to define test conditions so that they can be used at least for screening different materials.

Because of the very little wear in most of the test methods, a profilometer, laser scanner or similar method is used to measure the wear. For all these tests, computer software is necessary. This software is not yet specified or standardized. It has not yet been defined to what precision the screening of the surface has to be done, nor if the whole wear pattern has to be measured or only a part from it. From a practical standpoint, the patterns must also be precisely matched before and after the test, and for this purpose reference points have to be made in some cases, especially when measuring the antagonist.

The methods collected in this part of ISO/TS 14569 thus far leave these questions open to the common sense of the person who tests, but their answers will be incorporated later when more experience exists with these test procedures.

Wear, determined according to this part of ISO/TS 14569, is only valid together with the stated combination of tested materials. A generalization of the value obtained, for example as a material constant, is not possible. Polyacrylate as reference material, as well as sintered alumina for the antagonist, does not necessarily represent the situation in the mouth. These laboratory tests only give an indication for the clinical performance.