

Rolling bearings^{TC 4} meets GPS^{TC 213}

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Symposium

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Preface

The introduction of Geometrical Product Specification (GPS) definitions and symbology for rolling bearings was intended from ISO/TC 4 many years ago. Already in 1971 and later on in 1991 ISO/TC 4/SC 4 (ISO Technical Committee for rolling bearings/Subcommittee tolerances) recommended that the generalities and symbols given by ISO 1101 "Geometrical Product Specifications (GPS) – Geometrical tolerancing – Tolerances of form, orientation, location and run-out" shall be used in TC 4 standards when indicating tolerances of form and position. In several working group meetings this basic argument for the implementation of ISO 1101 was discussed, but the rolling bearing standards were kept unchanged.

Independent to ISO some rolling bearing manufacturers applied drawing symbols according to ISO 1101, but not always in a correct way and by the use of not standardized additional symbols, e. g. to specify measuring principles. Furthermore the standardized rolling bearing tolerance symbols were included into the form and position tolerance frames. Most of these drawing indications were very confusing, because they were not standardized, neither in rolling bearing standards nor in GPS standards.

In the course of time ISO 1101 was applied more and more on the surrounding elements of rolling bearing units (e. g. flatness of flanges), because this was requested from the users in order to describe the functional requirements on the interface. ISO 1101 was also applied more and more on drawings for supplied parts, because it got obvious that the suppliers are much more familiar with generic GPS drawing indications instead of specific rolling bearing specifications. Consequently costs for the translation of the specifications as well as for complaints could be avoided.

Another necessity to apply generic GPS specifications occurred when rolling bearing industry started to substitute the expensive classical measuring equipment (master rings, specific complex measuring devices) by flexible useable devices like coordinate measuring machines (CMM) and portable CMM, because such equipment is mainly designed to interpret ISO 1101. Rolling bearing tolerance features are not considered by default and have to be translated into geometrical tolerance indications specifically.

The same is relevant when using tolerance simulation tools, because the commercial available software currently is based on the needs of automotive and/or machine industry where ISO 1101 is the basis for the indication of geometrical tolerances.

Based on the reasons above rolling bearing manufacturer generate more and more inconsistent specifications, i. e. the surrounding geometry and supplied parts are specified with GPS indications, but the internal geometry and the main dimensions are specified according to "classical" rolling bearing standards. Additional specifications include the right indications for measuring equipment and simulation tools.

The tendencies and demands as described above led to a new approach on subject topic which was brought up to the ISO/TC 4 meeting June 2007 in Paris. There it was agreed that the possible use of the Geometrical Product Specification (GPS) system in ISO/TC 4 standards shall be investigated and a respective Working Group ISO/TC 4/WG 17 was established.

The first meeting of WG 17 was held in January 2008 with participants from the major players of rolling bearing industry. The outcome of the working group will be presented to the next ISO/TC 4 plenary meeting June 2009 and it will be interesting if the concerned rolling bearing standards will be changed accordingly.

The concept for the symposium Rolling bearings^{TC 4} meets GPS^{TC 213} was to support ISO/TC 4/WG 17, i. e. the GPS knowledge and approach of the rolling bearing specialists shall be improved and the state of the art on measuring technique, simulation tools and science shall be communicated. Additionally it was an initial event for coordination and cooperation in between TC 4 and TC 213.

As chairman of the Austrian Standards Committee ON-K 028 "Bearings/Tribology/Gears/Machine tools/Tools" and member of the Committee ON-K 031 "Requirements and verification of Geometrical product specifications – Technical documentation" I am proud that it was possible to arrange the symposium at Vienna – many thanks to the host and all the people who have assisted me.

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