

# International Standard



# 4288

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## Rules and procedures for the measurement of surface roughness using stylus instruments

*Règles et procédures pour le mesurage de la rugosité de surface avec des instruments à palpeur*

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4288 was prepared by Technical Committee ISO/TC 57, *Metrology and properties of surfaces*.

# Rules and procedures for the measurement of surface roughness using stylus instruments

## 0 Introduction

This International Standard is intended to assist in obtaining correct and comparable results when inspecting workpieces during manufacturing processes and also for finished products with respect to their surface roughness.

## 1 Scope and field of application

This International Standard specifies rules and procedures for the measurement of surface roughness parameters  $R_a$ ,  $R_v$  and  $R_z$  using stylus instruments of consecutive profile transformation and measuring systems with computers in which these instruments are used.

NOTE — Surface roughness parameters  $S_m$ ,  $S$  and  $t_p$  will be dealt with after rules and procedures for their measurement are agreed upon.

## 2 References

ISO 468, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

ISO 1879, *Instruments for the measurement of surface roughness by the profile method — Vocabulary.*

ISO 1880, *Instruments for the measurement of surface roughness by the profile method — Contact (stylus) instruments of progressive profile transformation — Profile recording instruments.*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval.*

ISO 2632, *Roughness comparison specimens —*

*Part 1 : Turned, ground, bored, milled, shaped and planed.*

*Part 2 : Spark-eroded, shot-blasted and grit-blasted, and polished.*

*Part 3 : Cast surfaces.*

ISO 3274, *Instruments for the measurement of surface roughness by the profile method — Contact (stylus) instruments of consecutive profile transformation — Contact profile meters, system M.*

ISO 4287/1, *Surface roughness — Terminology — Part 1 : Surface and its parameters.*

## 3 Definitions

For the purposes of this International Standard, the terms and definitions given in the standards referred to above shall apply where relevant.

## 4 General

In order to decide whether or not a particular manufacturing process gives the required surface finish, it is necessary to compare the values of the roughness parameters of the workpiece surface with the requirements specified on the drawings or in technical documents.

The surface roughness of the workpiece being inspected can appear homogeneous or be quite different over various areas. This can be seen by visual examination of the surface. In cases when the surface roughness appears homogeneous, roughness parameter values determined along the whole surface shall be used for comparison with the requirements specified on the drawings or in technical documents.

If there are separate areas with obviously different surface roughness, the surface roughness parameter values which are determined on separate areas shall be used for comparison with the requirements specified on the drawings or in technical documents.

For requirements specified by the upper limit of the surface roughness parameter, those separate areas of the surface shall be used which appear to have the maximum roughness, i.e. the maximum values of the surface roughness parameter. For requirements specified by the lower limit of the surface roughness parameter, those separate areas of the surface shall be used which appear to have the minimum roughness. If the roughness of the surface being inspected or of some of its areas differs substantially from the value specified on the drawings, then the method of visual evaluation or the method of comparison with roughness specimens in accordance with ISO 2632/1, ISO 2632/2 and ISO 2632/3 can be used for the surface roughness inspection. In these cases the above methods can give single-valued results. In other cases methods of measurement using instruments should be used.