JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 0631 : 2000

(ISO 12085 : 1996)
(JSA)

Geometrical Product Specification (GPS)—Surface texture : Profile method—Motif parameters

ICS 17.040.20

Descriptors : curves (geometry), product specification, products, specification

Reference number : **JIS B 0631 : 2000 (E)**

Documents
Document Sharing Hub

PROTECTED BY COPYRIGHT

Full document details: JIS B 0631-2000

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from the Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Clause 1, Article 12 of the Industrial Standardization Law.

Date of Establishment: 2000-03-20

Date of Public Notice in Official Gazette: 2000-03-21

Investigated by: Japanese Industrial Standards Committee
Divisional Council on Machine Elements

JIS B 0631 : 2000, First English edition published in 2002-07

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

© JSA 2002
All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

AVA Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT

Full document details: JIS B 0631-2000

Contents

		Page
Introduction		1
1	Scope	1
2	Normative references	1
3	Definitions	2
3.1	General definitions	2
3.2	Parameter definitions	4
4	Theoretically exact operator of the motif method	5
4.1	General	5
4.2	Conventional limits of motifs	5
4.3	Depth discrimination	5
4.4	Identification of roughness and waviness motifs through the combination of motifs	6
4.5	Procedure for parameter calculation	9
5	Measuring conditions of parameters	11
5.1	Convention concerning traversing the primary profile	11
5.2	Recommended measurement conditions	11
5.3	Profile quantization step	11
5.4	Rule for acceptance	11
5.5	Use of motifs method for analysis of multiprocess surfaces	11
5.6	Indications on the drawings	11
Annex A (normative)	Calculation method for combination of motifs	12
Annex B (informative)	Relation between motif parameters and function of surfaces	15
Annex C (informative)	Relation to the GPS matrix model	16
Annex D (informative)	Bibliography	17

Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT

Full document details: JIS B 0631-2000

Geometrical Product Specification (GPS)—Surface texture : Profile method—Motif parameters

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 12085** *Geometrical Product Specification (GPS)—Surface texture: Profile method—Motif parameters* published in 1996 without modifying the technical contents.

This Standard is a Geometrical Product Specification (GPS) standard and is to be regarded as a General GPS standard (see **TR B 0007**). It influences links 2, 3 and 4 of the surface texture chain of standards on roughness profile and waviness profile.

For more detailed information of the relation of this Standard to other GPS standards, see Annex C.

The approach described in this Standard facilitates the determining roughness and waviness parameters from the primary profile by finding those motifs which characterize the surface under consideration. This method is independent of any profile filter and results in parameters which are based on the depth and spacing of the motifs. These parameters, which are complementary to those defined in **ISO 4287**, can be used to describe the functional properties of workpieces as indicated in Annex B.

The portions underlined with dots are the matters not stated in the original International Standard.

Remarks : **TR B 0007** is identical with **ISO/TR 14638** : 1995 *Geometrical Product Specification (GPS)—Masterplan.*

1 Scope This Standard defines terms and parameters used for determining surface texture by the motif method. It also describes the corresponding ideal operator and measuring conditions.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied. The normative references without the indication of the year of coming into effect apply limiting only to the most recent edition.

JIS B 0031 *Technical drawings—Method of indicating surface texture on drawings*

Remarks : Items cited from **ISO 1302** : 1992 *Technical drawings—Method of indicating surface texture* are equivalent to the corresponding matters of the said standard.

JIS B 0651 *Surface texture—Instruments for the assessment of surface texture—Profile method*

ISO 3274 : 1996 *Geometrical Product Specifications (GPS)—Surface texture : Profile method—Nominal characteristics of contact (stylus) instruments*

Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT
Full document details: JIS B 0631-2000

ISO 4287 : 1997 *Geometrical Product Specifications (GPS)—Surface texture : Profile method—Terms, definitions and surface texture parameters*

ISO 4288 : 1996 *Geometrical Product Specifications (GPS)—Surface texture : Profile method—Rules and procedures for the assessment of surface texture*

3 Definitions For the purposes of this Standard the following definitions apply.

3.1 General definitions

3.1.1 surface profile Profile (**JIS B 0660** : 1998) that results from the intersection of the real surface by a specified plane. (See **ISO 4287**.)

3.1.2 primary profile Total profile (**JIS B 0660** : 1998) after application of the short wavelength filter, λs. (See Table 1 and **ISO 3274**.)

3.1.3 local peak of profile A part of a profile between two adjacent minima of the profile (see figure 1).

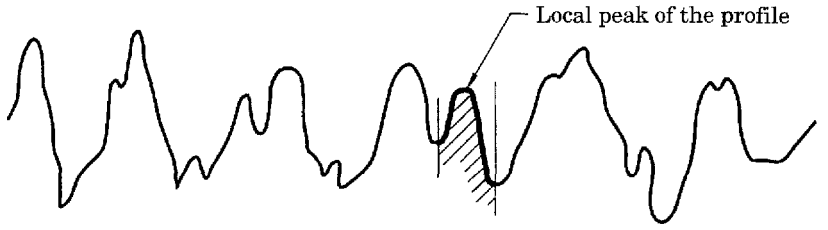


Figure 1 Local peak of profile

3.1.4 local valley of profile A part of a profile between two adjacent maxima of the profile (see figure 2).

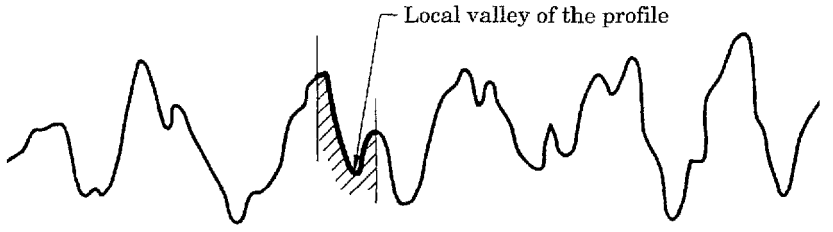


Figure 2 Local valley of profile

3.1.5 motif A portion of the primary profile between the highest points of two local peaks of the profile, which are not necessarily adjacent (see **4.4**).

A motif is characterized by (see figures 3 and 5):

— its length, AR_i or AW_i, measured parallel to the general direction of the profile;

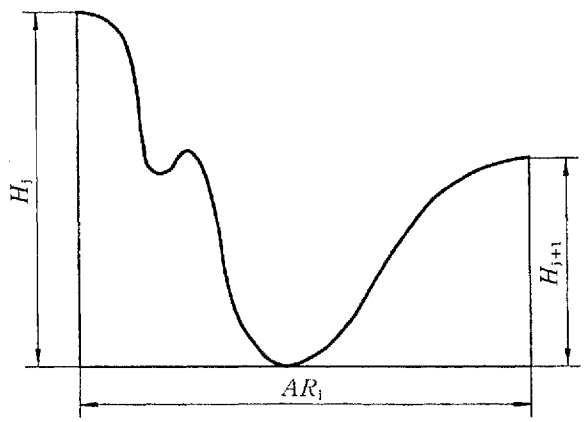
— its two depths, H_j and H_{j+1}, or HW_j and HW_{j+1}, measured perpendicular to the general direction of the primary profile;

— its T characteristic, that is the smallest depth between the two depths (e.g. H_j and H_{j+1}).

Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT
Full document details: JIS B 0631-2000

3.1.6 roughness motif Motif derived by using the ideal operator with limit value A as specified in **4.2** and **5.2** (see figure 3).

Note : By this definition, a roughness motif has a length AR_i smaller than or equal to A.



$T = \text{MIN}\ (H_j, H_{j+1})$

here: $T = H_{j+1}$

Figure 3 Roughness motif

3.1.7 upper envelope line of the primary profile (waviness profile) Straight lines joining the highest points of peaks of the primary profile, after conventional discrimination of peaks as shown in clause **4** (see figure 4).

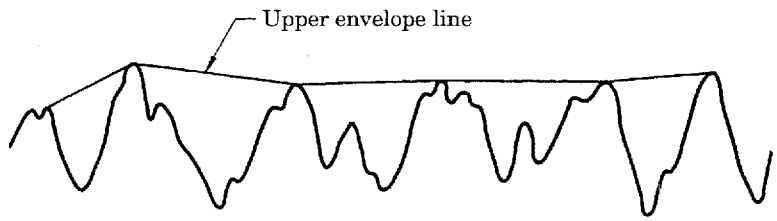
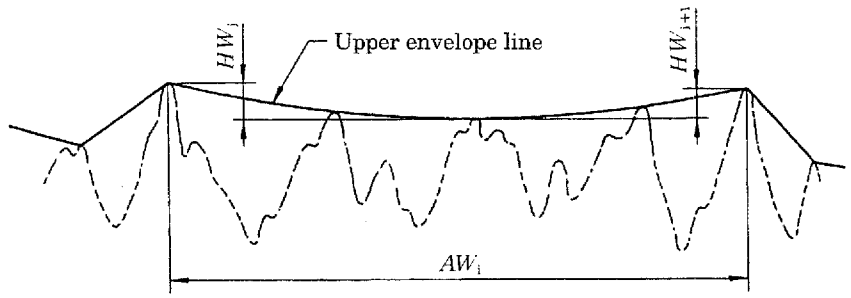


Figure 4 Upper envelope line

3.1.8 waviness motif Motif derived on the upper envelope line by using the ideal operator with limit value B as specified in **4.2** and **5.2** (see figure 5).



$T = \text{MIN}\ (HW_j, HW_{j+1})$

here: $T = HW_{j+1}$

Figure 5 Waviness motif

Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT
Full document details: JIS B 0631-2000

3.2 Parameter definitions

3.2.1 mean spacing of roughness motifs, *AR* The arithmetical mean value of the lengths AR_i of roughness motifs, within the evaluation length (see figure 6), i.e.

$$AR = \frac{1}{n}\sum_{i=1}^{n} AR_i$$

where n is the number of roughness motifs (equal to the number of AR_i values).

3.2.2 mean depth of roughness motifs, *R* The arithmetical mean value of the depths H_j of roughness motifs, within the evaluation length (see figure 6), i.e.

$$R = \frac{1}{m}\sum_{j=1}^{m} H_j$$

where m is the number of H_j values.

Note : The number of H_j values is twice the number of AR_i values ($m = 2n$).

3.2.3 maximum depth of profile irregularity, *Rx* The largest depth, H_j, within the evaluation length.

Example : On figure 6, $Rx = H_3$.

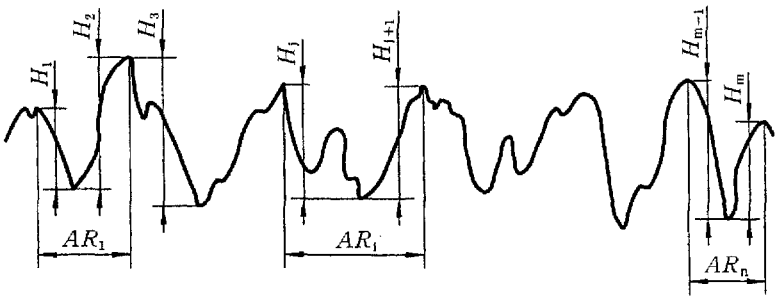


Figure 6 Roughness parameters

3.2.4 mean spacing of waviness motifs, *AW* The arithmetical mean value of the lengths AW_i of waviness motifs, within the evaluation length (see figure 7), i.e.

$$AW = \frac{1}{n}\sum_{i=1}^{n} AW_i$$

where n is the number of waviness motifs (equal to the number of AW_i values).

3.2.5 mean depth of waviness motifs, *W* The arithmetical mean value of the depths HW_j of waviness motifs, within the evaluation length (see figure 7), i.e.

$$W = \frac{1}{m}\sum_{j=1}^{m} HW_j$$

where m is the number of HW_j values.

Note : The number of HW_j values is twice the number of AW_j values ($m = 2n$).

3.2.6 maximum depth of waviness, *Wx* The largest depth HW_j, within the evaluation length (see figure 7).

Documents
Document Sharing Hub
PROTECTED BY COPYRIGHT
Full document details: JIS B 0631-2000