International Standard 468

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Surface roughness — Parameters, their values and general rules for specifying requirements

Rugosité de surface — Paramètres, leurs valeurs et les règles générales de la détermination des spécifications

First edition — 1982-08-01

UDC 621.795 **Ref. No. ISO 468-1982 (E)**

Descriptors : surface condition, roughness, specifications, profiles, dimensions.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 468 was developed by Technical Committee ISO/TC 57, *Metrology and properties of surfaces*, and was circulated to the member bodies in November 1980.

It has been approved by the member bodies of the following countries :

Australia	Germany, F. R.	South Africa, Rep. of
Austria	Hungary	Spain
Belgium	India	Sweden
Brazil	Italy	Switzerland
Canada	Japan	United Kingdom
China	Netherlands	USA
Czechoslovakia	Poland	USSR
France	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Mexico

Printed in Switzerland

INTERNATIONAL STANDARD ISO 468-1982 (E)

Surface roughness — Parameters, their values and general rules for specifying requirements

0 Introduction

This International Standard replaces ISO/R 468, *Surface roughness*, as far as the list of recommended parameters, their values and general rules for specifying requirements are concerned.

Terminology relevant to this International Standard is given in ISO 4287/1.

1 Scope and field of application

This International Standard relates to the surface roughness of products manufactured of materials and by methods that would normally yield surface roughness parameters within the following ranges of values :

0,008 µm < R_a < 400 µm

0,025 µm < R_z and R_y < 1 600 µm

0,002 mm < S and S_m < 12,5 mm

It indicates the terms to be used for the parameter, lay and type of surface, and gives general rules for specifying surfaces.

NOTE — The use of surface parameters other than those specified in this International Standard is also permitted, but in such cases they will need to be clearly defined.

This International Standard does not relate to surfaces whose characteristics make it impossible to check surface roughness by the methods normally used.

2 References

ISO 1302, *Technical drawings — Method of indicating surface texture on drawings.*

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

3 Definitions

Terms used in this International Standard are defined in ISO 4287/1 (i.e. surface roughness; sampling length l; least-squares mean line; profile departure y; line of profile peaks; line of profile valleys; spacing of local peaks of the profile; spacing of profile irregularities; arithmetical mean deviation of the profile R_a; ten point height of irregularities R_z; maximum height of the profile R_y; mean spacing of profile irregularities S_m; mean spacing of local peaks of the profile S; profile bearing length η_p; profile bearing length ratio t_p; profile section level c).

4 General rules for specifying requirements for surface roughness

4.1 General directives

Requirements for the surface roughness should be specified proceeding from its functional application to guarantee the given quality of products. If not required the surface roughness should not be specified and the roughness of such surfaces should not be inspected.

1) At present at the stage of draft.

4.2 Surface defects

Requirements for surface roughness are not applicable to surface defects; therefore, during the inspection of the surface roughness the surface defects (for example, scratches) should not be taken into account.

If necessary, the requirements for surface defects should be specified separately.

4.3 Structure of requirements

Requirements for the surface roughness should be specified by indicating the numerical value (maximum, minimum, nominal or the range of values) of the surface roughness parameter (or several parameters) and the value of sampling length on which the parameter is to be determined.

These numerical values of surface roughness parameters refer to sections normal to the geometrical surface. If the direction of these sections along the surface corresponds to maximum values of height parameters (R_a, R_z, R_y) for the given surface, it should not be specified. In other cases the direction of the section should be specified.

Additional requirements for the surface lay, the type or sequence of types of machining, the roughness of various areas should be specified when necessary, for example, requirements for surface areas limited by large pores of the porous material for sections of surface cuts having essentially different irregularities.

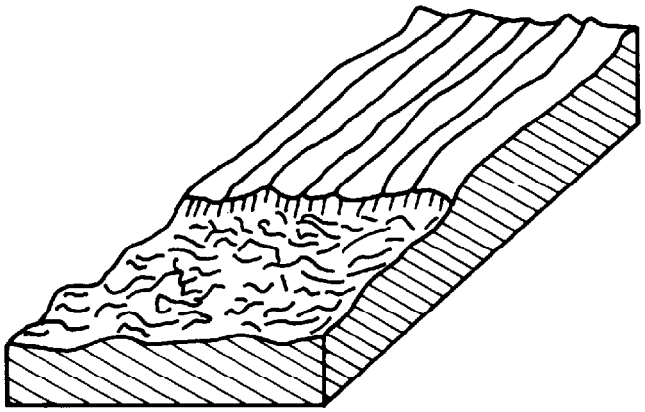

Figure — Surface areas having different types of irregularities

4.4 Expression of nominal values

When using nominal numerical values of surface roughness parameters the admissible deviations of the mean values shall be expressed as a percentage.

Deviations may be symmetrical or asymmetrical.

5 Surface roughness parameters

One or several of the surface roughness parameters listed below should be used for the specification of surface roughness.

R_a : arithmetical mean deviation of the profile;

R_z : height of the profile irregularities in ten points;

R_y : maximum height of the profile;

S_m : mean spacing of profile irregularities;

S : mean spacing of local peaks of the profile;

t_p : profile bearing length ratio.

NOTES

1 Minimum spacing of local peaks (valleys) of the profile which is to be taken into consideration is specified as 1 % of the sampling length l.

2 Minimum height of profile peaks (valleys, local peaks, local valleys), which is to be taken into consideration, is specified as 10 % of R_y.

6 Surface lay

Types of the surface lay are those given in table 2 of ISO 1302.

7 Numerical values of parameters

Numerical values of surface roughness parameters (maximum, minimum, nominal or the range of values) are to be selected from those given in tables 1, 2, 3 and 4.

8 Numerical values of the profile section level, c

Values of the profile section level, c, are to be expressed in linear values in micrometres or as a percentage of R_y to be selected from the following series : 5; 10; 15; 20; 25; 30; 40; 50; 60; 70; 75; 80; 90 %.

9 Numerical values of sampling length l

Values of the sampling length, l, are to be selected from the following series : 0,08; 0,25; 0,8; 2,5; 8; 25 mm.

Table 1 — Arithmetical mean deviation R_a of the profile

Values in micrometres*

0,008				
0,010				
0,012	0,125	1,25	**12,5**	125
0,016	0,160	**1,60**	16,0	160
0,020	**0,20**	2,0	20	**200**
0,025	0,25	2,5	**25**	250
0,032	0,32	**3,2**	32	320
0,040	**0,40**	4,0	40	**400**
0,050	0,50	5,0	**50**	
0,063	0,63	**6,3**	63	
0,080	**0,80**	8,0	80	
0,100	1,00	10,0	**100**	

* Preferred values are shown in bold type.

Table 2 — Height of irregularities of the profile in ten points, R_z — Maximum height of the profile, R_y

Values in micrometres*

	0,125	1,25	**12,5**	125	1 250
	0,160	**1,60**	16,0	160	**1 600**
	0,20	2,0	20	**200**	—
0,025	0,25	2,5	**25**	250	—
0,032	0,32	**3,2**	32	320	—
0,040	**0,40**	4,0	40	**400**	—
0,050	0,50	5,0	**50**	500	—
0,063	0,63	**6,3**	63	630	—
0,080	**0,80**	8,0	80	**800**	—
0,100	1,00	10,0	**100**	1 000	—

* Preferred values are shown in bold type.

Table 3 — Mean spacing of profile irregularities, S_m — Mean spacing of profile local peaks, S

Values in millimetres*

—	**0,012 5**	0,125	1,25	**12,5**
—	0,016 0	0,160	**1,60**	—
—	0,020	**0,20**	2,0	—
0,002	**0,025**	0,25	2,5	—
0,003	0,032	0,32	**3,2**	—
0,004	0,040	**0,40**	4,0	—
0,005	**0,050**	0,50	5,0	—
0,006	0,063	0,63	**6,3**	—
0,008	0,080	**0,80**	8,0	—
0,010	**0,100**	1,00	10,0	—

* Preferred values are shown in bold type.

Table 4 — Profile bearing length ratio, t_p

t_p, %	10	15	20	25	30	40	50	60	70	80	90