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NO. : TSZ2211G

TITLE : GENERAL TOLERANCES FOR PARTS FORMED BY SHEAR  
FROM METAL PLATES

CLASS : C

PUBLICATION RECORD

(Asterisk mark "\*" in this standard denotes the changed portion from previous issue.) :

Revised ("\*" Omitted)  
Changed terms and explanation.

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TOYOTA ENGINEERING STANDARD

TSZ2211G

CLASS

C

GENERAL TOLERANCES FOR PARTS FORMED BY SHEAR FROM METAL PLATES

## 1. Scope

This standard covers general dimensional tolerances for the cut width and general tolerances for straightness and rectangularity of metal plates 6 mm or less in thickness, cut off by a straight-blade shearing machine such as gap shear, square shearer, etc. Specific tolerances shall be separately indicated on drawing, however, for those which cannot be covered by this standard.

Remark: General tolerances are effective for dimensions shown in drawings and associated specifications, for which no particular precision is required in terms of function.

## 2. Definitions

Definitions of terms referred to in this standard shall be as follows or as specified in TSZ1001G and TSZ2300G.

## (1) Cut width

The distance between the side which has been cut by the cutting edge of a shear and its opposite side ("b" in Fig. 1).

## (2) Cut length

The length of the side which has been cut by the cutting edge of a shear ("l" in Fig. 1).

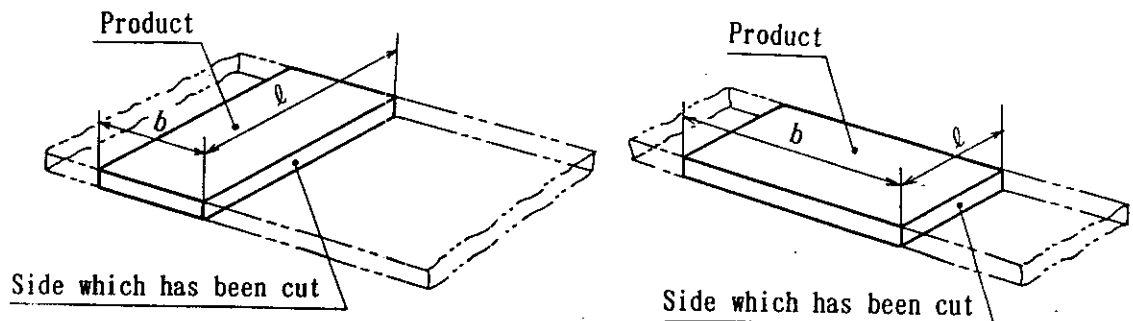


Fig. 1

Prepared and Written by :

Engineering Information System Planning Dept.

Engineering Administration Div.

Engineering Administration Div.  
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(3) Straightness

The magnitude of deviation from the geometrically correct straight line at the portion of the side which has been cut being touched with the cutting edge ("f" in Fig. 2).

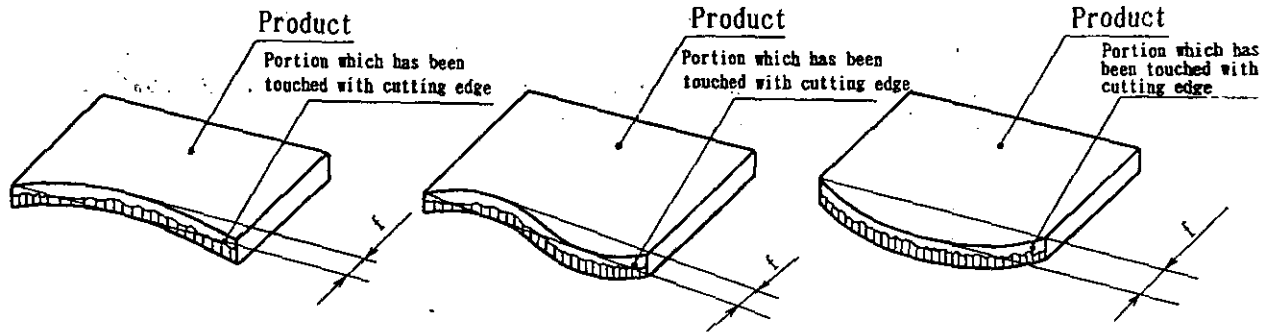


Fig. 2

(4) Rectangularity

Taking the long side as the datum shape body, the magnitude of deviation of the portion of the short side which has been touched with the cutting edge from a vertical geometrical plane in respect to the datum shape body ("f" in Fig. 3). In the case where the two sides are equal in length, any one side may also be taken as the datum shape body.

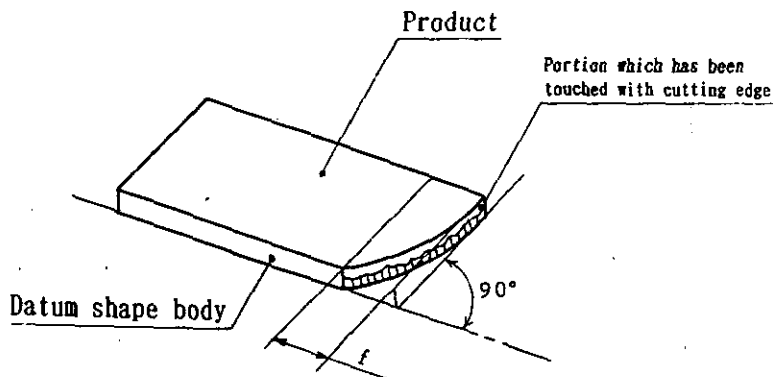


Fig. 3

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### 3. General Dimensional Tolerances on Cut Width

General dimensional tolerances on cut width shall be classified into two grades of Grade A and Grade B according to plate width divisions, respectively, and respective dimensional tolerances shall be in accordance with Table 1.

Table 1 General Permissible Dimensional Deviations on Cut Width

Unit: mm

Division of basic dimension	Division of plate thickness (t)					
	$t \leq 1.6$		$1.6 < t \leq 3$		$3 < t \leq 6$	
	Grade					
	SPA	SPB	SPA	SPB	SPA	SPB
Up to and incl. 30	±0.1	±0.3	±0.2	±0.3	±0.5	±0.8
Above 30 up to and incl. 120	±0.2	±0.5	±0.3	±0.5	±0.8	±1.2
Above 120 up to and incl. 400	±0.3	±0.8	±0.4	±0.8	±1	±1.5
Above 400 up to and incl. 1000	±0.5	±1	±0.5	±1.2	±1.5	±2
Above 1000 up to and incl. 2000	±0.8	±1.5	±0.8	±2	±2	±3
Above 2000 up to and incl. 4000	±1.2	±2	±1.2	±2.5	±3	±4

### 4. General Tolerances on Straightness

General tolerances on straightness shall be classified into two grades of Grade A and Grade B, and the respective tolerances shall be in accordance with Table 2.

Table 2 General Tolerances on Straightness

Unit: mm

Division of nominal size of cut length	Division of plate thickness (t)					
	$t \leq 1.6$		$1.6 < t \leq 3$		$3 < t \leq 6$	
	Grade					
	SPA	SPB	SPA	SPB	SPA	SPB
Up to and incl. 30	0.1	0.2	0.1	0.2	0.2	0.3
Above 30 up to and incl. 120	0.2	0.3	0.2	0.3	0.5	0.8
Above 120 up to and incl. 400	0.3	0.5	0.3	0.5	0.8	1.5
Above 400 up to and incl. 1000	0.5	0.8	0.5	1	1.5	2
Above 1000 up to and incl. 2000	0.8	1.2	0.8	1.5	2	3
Above 2000 up to and incl. 4000	1.2	2	1.2	2.5	3	5

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## 5. General Tolerances on Rectangularity

General tolerances on rectangularity shall be classified into two grades of Grade A and Grade B, and the respective tolerances shall be in accordance with Table 3.

Table 3 General Tolerances on Rectangularity

Unit: mm

Division of nominal length of short side	Divisions of plate thickness (t)			
	t ≤ 3		3 < t ≤ 6	
	Grade			
	SPA	SPB	SPA	SPB
Up to and incl. 30	0.1	0.3	0.3	0.4
Above 30 up to and incl. 120	0.3	0.5	0.5	0.8
Above 120 up to and incl. 400	0.8	1.2	1	1.5
Above 400 up to and incl. 1000	1.5	3	2	3
Above 1000 up to and incl. 2000	3	6	4	6
Above 2000 up to and incl. 4000	6	10	6	10

## 6. Indications on Drawings

General tolerances for parts formed by shear from metal plate shall be indicated on drawings or associated specifications by the standards number of this standard, followed by the symbol for the tolerance grade (Example 1). Only the symbol for the tolerance grade, however, shall be marked if indicating on the title block on the drawing (Example 2).

- Examples: 1. Grade A of general tolerance: TSZ2211G-SPA  
2. Grade B of general tolerance: SPB

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APPENDIX TOLERANCES FOR PARTS FORMED BY SHEAR FROM METAL PLATES

## 1. Scope

This Appendix covers general tolerances for parts formed by shear from metal plates specified in already issued drawings which were subjected to the application of TTDS § 5-13.

Remark: It is desirable to change the standard to be applied from TTDS § 5-13 to the Text of this standard for the drawings which were subjected to the application of TTDS § 5-13, when they are issued as renewed drawings or revised drawing for the purpose of engineering change.

## 2. Definitions

Same as the Text of this standard.

## 3. General Dimensional Tolerances on Cut Width

Same as the Text of this standard.

## 4. General Tolerances on Straightness

Same as the Text of this standard.

## 5. General Tolerances on Rectangularity

Same as the Text of this standard.

## 6. Indication on Drawings

General tolerances for parts formed by shear from metal plates shall be indicated on drawings or associated documents by the standards number of TTDS and the symbol for the grade (Example 1). Only the symbol of grade shall be indicated, when it is shown on the title block of drawings (Example 2).

Examples: 1. Grade A of general tolerance: TTDS § 5-13-SPA

2. Grade B of general tolerance: SPB

## Applicable Standards

TSZ1001G Glossary of Technical Drawing Terms

TSZ2300G Geometrical Tolerancing

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