

**PS:
219-1993 (4th Rev.)**

PAKISTAN STANDARD

**SPECIFICATION FOR
SAFETY RAZOR BLADES (DOUBLE – EDGE)**



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FOR

SAFETY RAZOR BLADES (DOUBLE – EDGE) (4TH REVISION)

0. FOREWORD

- 0.1 This revised Pakistan Standard was adopted by the Standard Development Centre Pakistan Standards and Quality Control Authority, after the draft prepared by the Sectional Committee for “Small Scale Industrial Products” had been duly approved and endorsed by the Mechanical Engineering Divisional Council.
- 0.2 This Pakistan Standard No. 219 was first laid-down in 1979 and was revised in 1981, 1988, 1992 respectively. Now it has been revised to accommodate the latest technology and technical know-how.
- 0.3 The following standards have been consulted which are acknowledged with thanks.
- i. GG-R-0060 a(GSA-FSS)/ for Razors, Safety and Blades Razor.
 - ii. CAS No.5-36/, Safety Razor Blades.
 - iii. ISO:2859/1/89, Sampling Procedure for Inspection by Attributes.
- 0.4 This Standard is subject to periodical review in order to keep pace with the development in technology. Any suggestion for improvement will be recorded and placed before the Sectional Committee in due course.
- 0.5 This Standard is intended chiefly to cover the technical provisions related to the manufacturer and supply of the material and it does not include all the provisions of a contract.

1. SCOPE

- 1.1 This Standard sets out requirements for the types of razor blade as follows:
- a) Carbon steel type;
 - b) Stainless Steel type.

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2. Shape, dimensions and tolerances

2.1 The shape and dimensions of Razor blade shall be as shown in Figure-1.

2.2 **Tolerances**

2.2.1 The finished half width of the blade shall be 10.950 ± 0.075 mm.

2.3 **Length**

2.3.1 The length of the blade shall be 37.00 ± 0.15 mm.

2.4 **Width**

2.4.1 The width of the blade shall be measured by leaving 2 mm at each corner as shown in the figure or by any other similar measuring means keeping in view the delicacy of the blade edges.

3. **Material**

3.1 The steel used in the manufacture of Razor blades shall be of prime quality.

4. **Sampling Procedure**

4.1 **Lot** – In any consignment, all the blades of the same type and manufactured from the same material under essentially similar conditions of manufacture shall be grouped together to constitute a lot.

4.2 **Sampling Plan** - A sampling plan indicates the number of units of products from each lot or batch which are to be inspected (sample size or series sample sizes) and the criteria for determining the acceptability of the lot or batch (acceptance and rejection numbers).

4.3 **Inspection Level** - The inspection level determines the relationship between the lot or batch size and the sample size. The inspection level to be used for any particular requirement will be prescribed by the responsible authority. Three inspection levels I, II and III are given in table 1 for general use. Unless otherwise specified, inspection level II will be used with an acceptance quality level (AQL) as shown in table 2.

4.4 **Code Letter**- Sample sizes are designated by code letters table No. 2 shall be used to find the applicable code letter for the particular lot or batch size and the prescribed inspection level.

4.5 **Obtaining sampling plan** - The (AQL)and the code letter shall be used to obtain the sampling plan from table 2.

5. Tests

5.1 Perforation alignment pattern

The perforation alignment pattern shall be of type which enables the blade to be fitted to the normal types of double edged safety razors available in the market. This alignment pattern shall cater for the bar pin or end located styles.

5.2 Symmetry - In each type of blades, the perforation when tested in accordance with the requirements, of clause A-1 of Appendix –A shall be symmetrical about the longitudinal axis of the finished blade to within 0.22 mm.

5.3 Heat treatment - The steel strips shall be suitably heat treated to make sharp and durable edges of the blades. The hardness of the blade after chemical coating shall be as follows:

- a) Carbon steel blades – 550 – 650 HV after coating;
- b) Stainless Steel blades – 600 – 720 HV after coating.

5.3.1 The blades shall be tested for hardness on Vickers hardness tester and/or mini-load hardness tester in accordance with the method given in clause –A-2.

5.4 Nicks when examined in accordance with the method given in clause A-3 the blades shall average not more than three nicks per blade edge of a size larger than 0.01 mm. The distance between the nicks shall be not less than 6.3 mm.

5.5 Straightness and parallelism of cutting edges - When checked on top of the cutting edge along the full length of the blade, each cutting edge shall be straight to within 0.040 mm. The two cutting edges of the double -edged blade shall be straight and parallel to within 0.080 mm so that when measured at the two ends and at least three intermediate positions, there shall not be a variation in excess of 0.080 mm in the maximum and minimum perpendicular measurements between the two cutting edges as per clause 2.4.1.

5.6 Shaving performance- When tested in accordance with the requirements of clause A-5.

- a) Carbon steel blades shall give an average of two satisfactory shaves per blade.
- b) Stainless steel blade shall give an average of four satisfactory shaves per blade.

6. Flexibility - The blade shall have an approved flexibility and when tested in accordance with the requirements of Clause A-6. They shall not crack or break.

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7. **Surface Treatment** - Each carbon steel blade shall be given appropriate surface treatment.

NOTE - If the lot No. is not applied to the blade it self, it shall be supplied on the wrapper, tuck or carton.

7.1 **Printing** - Each blade shall be neatly printed/etched with the brand name with side indication.

7.2 **Additional blade edge treatment** - The blades may receive additional treatment in the cutting edge area to improve smoothness and life.

8. **Protective Coating** - Before packing each blade shall receive a thin protective coating of the approved mineral oil or plastic compound or any suitable chemical.

9. **Packing and marking** - Each blade shall be packed as follows:

a) **First wrapping** - The blade shall be completely wrapped in an approved wax impregnated paper.

b) **Outer wrapping** – This shall be in a suitable printed wrapper bearing the following information:-

i. Type of blade.

ii. Brand name.

c) **Protection of cutting edges** - The blades shall be so packed that on cutting edge makes contacts with any surface of the packing material.

d) **Packets** - The blades shall be packed in containers permanently and indelibly marked on the outside with the information required as below:-

i. Name or Trade Mark of the manufacturer and country of origin.

iii. Type of blade.

iv. Information for use (where applicable)

v. Quantities.

9.2 Packet may also be marked with the PSQCA-SDC Certification Mark.

APPENDIX - A

A. General

Before proceeding with the following tests, examine the blades and containers for compliance with the requirements of clauses 2, 5.1, 5.5, 7, 8 and 9.

A- Method of test for symmetry

A-1.1 Procedure

- i) Place the finished blade after punching in an approved jig and apply the measuring pin of fixed dial gauge to one end.
- ii) Reverse the finished blade blank in the jig and apply the dial gauge to the opposite edge. The difference between the two reading is the lack of symmetry.

A-2 Hardness Test

- i) **Equipment :** A Vickers hardness tester/or mini load hardness tester or any other equivalent equipment.
- ii) **Procedure:** Use one kg or 0.50 kg load for testing the hardness of blade.

A-3 Nick Test

- A) **Apparatus:** A one hundred power microscope equipped with a field micrometer eye-piece with 0.01 mm graduations.
- B) **Preparation:** Oil, grease, protective film and lint shall be removed from the cutting edges of the blade by suitable means which will not damage the blade edge. The blade edge shall then be placed in the microscopic field and adequately illuminated for clear vision.
- C) **Measurement**
 - i) Measure the distance between nicks for compliance with the requirements of Clause 5.4.
 - ii) Nicks greater than 0.01 mm in any direction shall be counted and the number of nicks in the sample shall be divided by the number of blade edges in a blade examined. If the average number of nicks per edge is greater than 3, the blade shall be considered as defective, however that is position of the lot is liable to rejection based on sampling plan as per clause 4.

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A-4 Method of test for facet angles

Remove all the plastic, lacquer and oil coatings, then place the blade in an approved goniometer and measure the facet angle during process

A-5 **Shaving Test**

i) **General**

- a) The test shall be carried out by minimum 5 persons.
- b) The test shall be carried out on 24 ± 4 hour old human stubble.

ii) **Procedure**

The blade shall be fitted to a standard safety razor and the operator shall shave in an usual manner using shaving cream with warm water.

- iii) **Expression of results** - The operators shall continue shaving with the blade each day until they feel that the blade started giving un-satisfactory shave. The average number of shaves shall be determined by dividing the number of satisfactory shaves by the number of operators performing the test. The number of operators shall be between 5 to 10 persons.

Criteria.

Carbon steel blade - minimum 2 satisfactory shaves.

Stainless steel blade - minimum 4 satisfactory shaves.

- iv) **NOTE** - Carbon Steel and stainless steel blades should be tested on person habitual to that particular type of blade.

A-6 FLEXIBILITY TEST

A) **Procedure** - The blades shall be bent around smooth steel bars in accordance with the following requirements:

DIRECTION OF FLEX

DIAMETER OF BAR

A long the "long axis"

38 mm

A long the "short axis"

32 mm

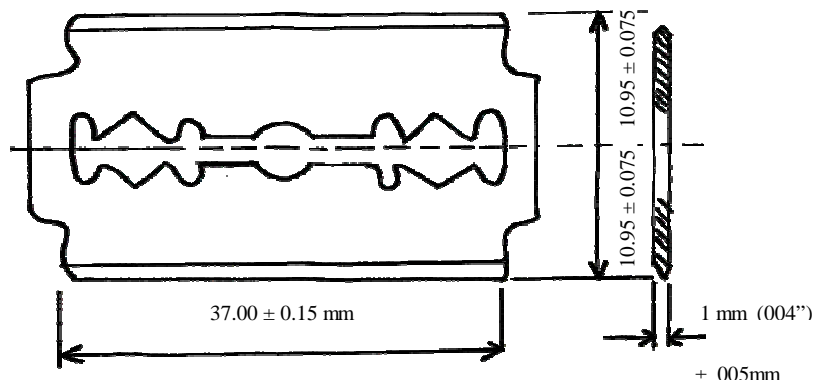


TABLE – 1
SAMPLE SIZE CODE LETTERS

Lot or batch size	Special Inspection levels				General Inspection levels		
	S-1	S-2	S-3	S-4	I	II	III
2 to 8	A	A	A	A	A	A	B
9 to 15	A	A	A	A	A	B	C
16 to 25	A	A	B	B	B	C	D
26 to 50	A	B	B	C	C	D	E
51 to 90	B	B	C	C	C	E	F
91 to 150	B	B	C	D	D	F	G
151 to 280	B	C	D	E	E	G	H
281 to 500	B	C	D	E	F	H	J
501 to 1200	C	C	E	F	G	J	K
1201 to 3200	C	D	E	G	H	K	L
3201 to 10000	C	D	F	G	J	L	M
10001 to 35000	C	D	F	H	K	M	N
35001 to 150000	D	E	G	J	L	N	P
150001 to 500000	D	E	G	J	M	P	Q
500001 and over	D	E	H	K	N	Q	R

Table II-A - Single sampling plans for normal inspection

Sample size letter	Sample size	Acceptable quality levels (normal inspection)																										
		0.010	0.015	0.025	0.040	0.065	0.10	0.15	0.25	0.40	0.65	1.0	1.5	2.5	4.0	6.5	10	15	25	40	65	100	150	250	400	650	1 000	
A	2	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
B	3	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
C	5	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
D	8	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
E	13	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
F	20	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
G	32	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
H	50	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
I	80	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
J	125	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
K	200	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
L	315	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
M	500	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
N	800	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
P	1 250	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
Q	2 000	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re

↓ = Use first sampling plan below arrow. If sample size equals, or exceeds, lot or batch size, carry out 100 % inspection.

↑ = Use first sampling plan above arrow.

Ac = Acceptance number

Re = Rejection number