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PAKISTAN STANDARD

**SINGLE AND MULTIPLE BLADE PLASTIC BONDED DISPOSABLE
RAZORS & CARTRIDGES**



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FOR
SINGLE AND MULTIPLE BLADE PLASTIC BONDED DISPOSABLE RAZORS & CARTRIDGES

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CONTENTS

<u>S.#</u>	<u>Title</u>	<u>Page #</u>
0.	FOREWORD	iv
1.	SCOPE	01
2.	COMPONENTS OF DISPOSABLE RAZORS:	01
3.	M A T E R I A L	01
4.	DIMENSIONS	02
5.	F I N I S H	03
6.	SAMPLING	03
7.	T E S T S	04
8.	PACKING AND MARKING	04
9.	APPENDAX-A	05-07
10.	FIGURES	08-11
11.	TABLE 2	12
12.	TABLE 3	13

PAKISTAN STANDARD SPECIFICATION
FOR
SINGLE AND MULTIPLE BLADE PLASTIC BONDED DISPOSABLE RAZORS & CARTRIDGES

0. FOREWORD

- 0.1 This Pakistan Standard has been adopted by the Authority of the Pakistan Standards & Quality Control Authority, (National Standards Body of Islamic Republic of Pakistan), after the draft prepared by the Mechanical Technical Committee (MTC-01) for “Small Scale Industrial Products” which has been approved and endorsed by the National Standards Committee on Mechanical on 28.02.2017
- 0.2 This Pakistan Standard No. 2002 was first laid down in 1988 which had been revised in 92, 93 and 97 respectively to accommodate the latest technology and knowledge. Keeping in view the local & international market trend, it has been felt necessary once again to revise the existing version, 1997 to accommodate technological changes which took place during the last one decade.
- 0.3 In the preparation of this Pakistan standards, assistance has been derived from the following standards and data which are acknowledge with thanks.
- I. PS:219, Safety Razor Blade (Double Edge).
 - II. PS-ISO:2859/1/99, Sampling Procedure for inspection by Attributes.
 - III. Data / Diagram provided by M/s Treet Corporation Ltd, Lahore & Gillette Pakistan
 - IV. **DIN/ISO 3951/2013- Sampling Plan.**
- 0.4 This revised version of PS: 2002 has been adopted after taking into consideration the views and the suggestions of manufacturers, specialists, technologists and utilizing agencies. It is hoped that user will find it well in line with the technical barriers to trade agreement (WTO/TBT).
- 0.5 This Pakistan 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 Pakistan standard is intended chiefly to cover the technical provisions relating to the material and manufacturer and it does not include all the necessary provisions of a contract.

1. **SCOPE:**

- 1.1 This Pakistan Standard sets out requirements for the following types of the Razor blades:
- i. Single blade disposable type plastic bonded razors & cartridges.
 - ii. Multi blade disposable type plastic bonded razors & cartridges.

2. **COMPONENTS OF DISPOSABLE RAZORS:**

- 2.1 Main components of all type plastic bonded disposable razors can be seen in Figure I, which are a cartridge and a handle.

3. **MATERIAL:**

3.1 **BLADE**

Following tests shall be conducted for qualification of the blade:

- i) **Corrosion Test** (as per ASTM-5.6)
- ii) **Coating Test through Eddy Current / Coating gauge.**
- iii) **Elasticity Test** (As per ASTM D522/D522M-13)
- iv) **Chemical Composition** (as per Table-4)

Or conformity to an ISO Standard or Standards of any of the ISO bodies

- 3.1.1 Chemical Composition – The blades shall be manufactured from suitable stainless steel strip.

- 3.1.2 Hardness after Chemical Coating – The Hardness of the blade after coating should be from **550HV** to 750 HV

- 3.1.3 The blades shall be tested for Hardness on a Vicker hardness tester using in accordance with the method given in clause A-2 of Appendix-A.

3.1.4 **Outer Body**

Polypropylene, Polycellulous may be used (optional)

3.1.5 **Fixing angle**

Fixing angle as shown at Figure 4-A may be specified by the manufacturer.

3.2 **PLASTIC COMPONENTS FOR DISPOSABLE RAZORS**

- 3.2.1 **High impact Polystyrene, Crystal Polystyrene and Master Batch** or other suitable thermoplastic should be mixed in a suitable ratio to withstand at least seven shaves and also it should withstand several drops from shoulder height.

- 3.2.2 There should be no superficial defect in any of the components such as post mould shrinkage burs and warping etc.

4. **DIMENSIONS:**

4.1 **B L A D E**

4.1.1 The dimensions of the blades shown in the figure-2a, 2b and figure-3a, 3b for guidance and not binding.

4.2 **DISPOSABLE RAZORS & CARTRIDGES**

4.2.1 The sizes of the disposable razors & cartridges should be as per table-1 given below:-

Table – 1: Dimensions (mm) for single & Multiple Blade Plastic Bonded Disposable Razors & Cartridges

Sr. No.	Name	Overall length of disposable razor	Length of cartridge	Length of blade
1.	Regular Disposable Razor	100 ± 5	40± 2	37.50 ± 0.6
2.	Long Handle Disposable Razor	125 ± 15	40 ± 2	37.50 ± 0.6
3.	3 Blade Razor	125 ± 15	40± 2	37.50 ± 0.6
4.	4 Blade Razor	125 ± 15	40 ± 2	37.50 ± 0.6
5.	5 Blade Razor	125 ± 15	40 ± 2	37.50 ± 0.6
6.	Above 5 Blade Razor	125 ± 15	40 ± 2	37.50 ± 0.6
7.	3 Blade Cartridges	----	40 ± 2	37.50 ± 0.6
8.	4 Blade Cartridges	----	40 ± 2	37.50 ± 0.6
9.	5 Blade Cartridges	----	40 ± 2	37.50 ± 0.6
10.	Above 5 Blade Cartridges	----	40 ± 2	37.50 ± 0.6

4.2.2 Width & Thickness of the blade should be as specified by the manufacturer.

5. **FINISH:**

- 5.1 **Shape Angle** – The cartridge along with the blade should be mounted on the handle in such a way that the contact surface of the upper part of cartridge should make a suitable angle with horizontal axis as given in the Figure – 4B at the discretion of the manufacturer.
- 5.2 The blade shall be held inside of the cartridge so that it may not get out of cartridge loose during the shaving.
- 5.3 The outer finishing of plastic components shall be smooth, free from burrs and sharp corners etc. so that it does not give scratching effect on the face of the shaver.

6. **SAMPLING:**

- 6.1 **Vide. PS-ISO:2859/1/1999- Sampling Procedure for inspection by Attributes**

Lot - In any consignment, all the Plastic Bonded Disposable Razor of the same type and manufacturer from the same material under essentially similar conditions of manufacturer, shall be grouped together to constitute a lot -Table-2.

- 6.3 **Sampling Plan** - A sampling plan indicates the number of units of product from each lot or batch which are to be inspected (sample size or series of sample sizes) and the criteria for determining the acceptability of the lot or batch (acceptance and rejection numbers)Table-3.Or **DIN/ISO 3951- Sampling Plan may be consulted.**

- 6.4 **Inspection Level** - The inspection level determines the relationship between the lot or batch size and the sample size. Three inspection levels, I, II and III are given in table 2 – for general use. Unless otherwise specified, inspection level II will be used with an AQL of 4 as shown in table-3.

- 6.5 **Code letters** - Sample sizes are designated by code letters, Table-2 shall be used to find the applicable code letter for the particular lot or batch size and the prescribed inspection level.

- 6.6 **Obtaining Sampling Plan** - The acceptable quality level (AQL) and the code letter shall be used to obtain the sampling plan from Tahble 3.

Or according to the ISO/ISO member bodies standard procedure.

7. T.E.S.T.S

7.1 **Nicks-** When examined in accordance with the method given in clause A-3 of appendix-A, the blades shall have, on average lot more than three nicks per blade edge of a size not larger than 0.01mm. The distance between the nicks shall not be less than 6.3mm.

7.2 **Straightness and Parallelism of Cutting Edge-**When checked the top of the cutting edge of the blades along the full length shall be straight to within 0.1mm excluding the corner radii.

7.3 When tested in accordance with the requirements of Clause A-4 of appendix- A the facet angles shall be balanced to within 2° (where applicable).

NOTE- The Chemical coating of the blade shall be removed to observe angles.

PS:2002/--

8. **PACKING AND MARKING:**

8.1 Each razor shall be packed as follows:-

Packets- The razor shall be suitably packed permanently and indelibly marked on the out side with the following information:

- I. The name or trade mark of the manufacturer and country of origin.
- II. The razor type.
- III. Information for use (where applicable).
- IV. Quantities.
- V. **PS Number**
- VI. **PS Mark & License Number. (The Marking of PS Number and PS Mark & License number on the razor are not applicable for foreign manufacturer.)**

APPENDAX-A**A GENERAL**

Before proceeding with the following tests examine the blades and containers for compliance with the requirements of clauses 2.5.1 and 5.3.

A-1 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 gauge to one edge.

A-2 Hardness Test

- I. Equipment – A Vicker Hardness Tester or any other standard equipment

A-3 Nick Test

a) **Apparatus** – A one hundred power microscope equipped with a field micrometer eye-piece with 0.10mm 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 than 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 7.1.
- II. Nicks measuring between 0.01mm to 0.015mm in any direction shall be counted and the number of nicks in the sample blade edges shall be divided by the number of edges in a blade examined. If the average number of nicks per blade edge is greater than 3, the razor shall be considered as defective, However, the disposition of the lot is liable to rejection based only on sampling plan as per clause-6.

A-4 Method of test for facet angles.

1. Cartridges are disassembled very carefully
2. Blades are taken out ensuring that they are not touched or damaged during the disassembling/blade removing process.
3. The blades are thoroughly cleaned with the help of any detergent.
4. Blades are dried off in case of thick/silky oil layer on the edges, blades are wiped with the help of soft grade thermopore to remove the oil layer, in practice chemical coating layer is not removed during the process to avoid the risk of blade bending or demaging because angle read ability on the instrument is generally good enough even with the chemical coating layer on the edges.
5. The blades are put on laser goniometer to measure the facet angles.

A-5 Shave Test

- I. **General** - The test shall be carried out on 24 ± 4 hr old human stubble.
- II. **Procedure** - The inspector/operator shall shave in the normal manner.
- III. **Expression of results** – The operator(s) shall continue shaving with the razor each day until they feel that the blade has started giving unsatisfactory shave.
The average No. of shaves shall be determined by dividing the number of satisfactory shaves by the number of operators performing the test.
The number of operators should be between 5 to 10 persons.

CRITERIA:

Single blade razor - Minimum 3 shaves satisfactory.

Twin blade razor - Minimum 5 shaves satisfactory.

Three blade razor - Minimum 7 shaves satisfactory

Four blade razor - Minimum 7 shaves satisfactory

Five blade razor - Minimum 7 shaves satisfactory

Above Five blade razor - Minimum 7 shaves satisfactory

Three blade Cartridge - Minimum 7 shaves satisfactory

Four blade Cartridge - Minimum 7 shaves satisfactory

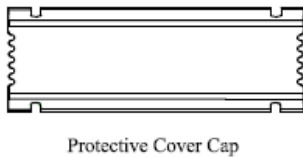
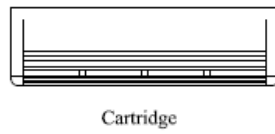
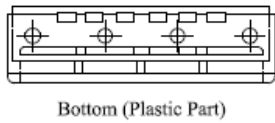
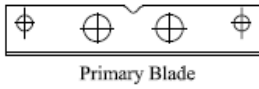
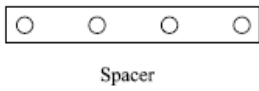
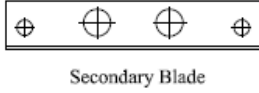
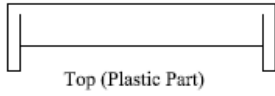
Five blade Cartridge - Minimum 7 shaves satisfactory

Above Five blade Cartridge - Minimum 7 shaves satisfactory

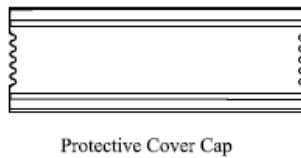
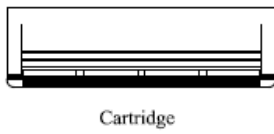
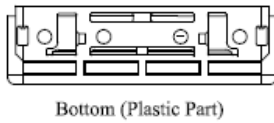
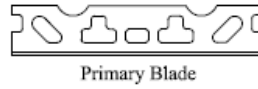
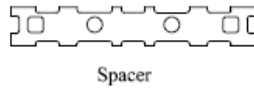
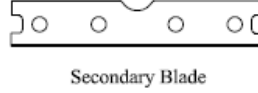
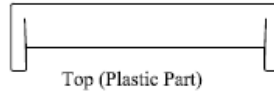
Satisfactory shave séance - A clean shave achieved without cuts and nicks on a normal face.

Quality Standard and process/procedure for sampling and testing according to ISO/ISO member bodies are acceptable.

PARTS OF NON WASH-THROUGH TWIN BLADE DISPOSABLE RAZOR



PARTS OF WASH-THROUGH TWIN BLADE DISPOSABLE RAZOR



PARTS OF SINGLE BLADE DISPOSABLE RAZOR

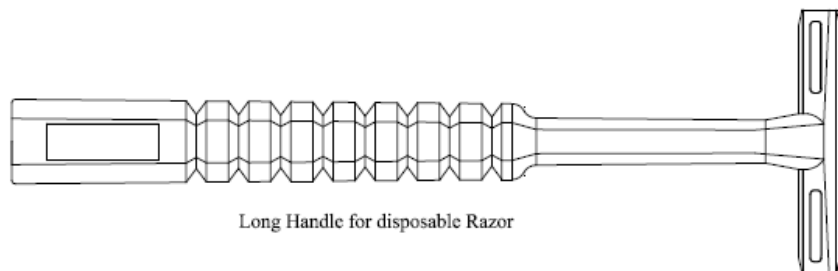
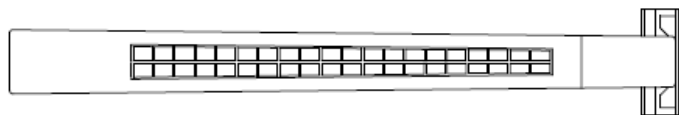
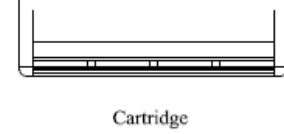
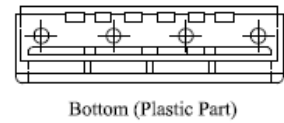
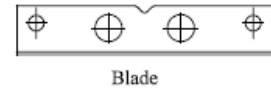
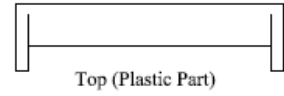


Figure - 1

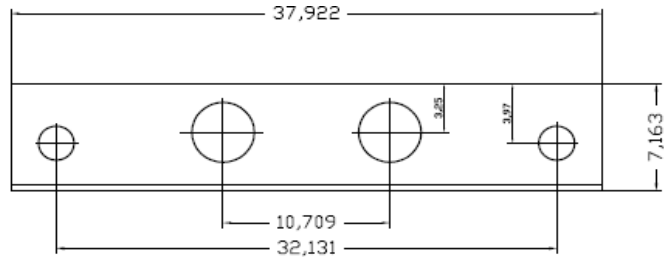


Figure 2a --

Secondary Blade for Non Washthrough Razor

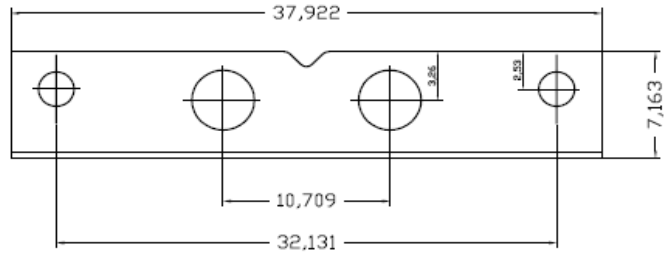


Figure 2b --

Primary Blade for Non Washthrough Razor

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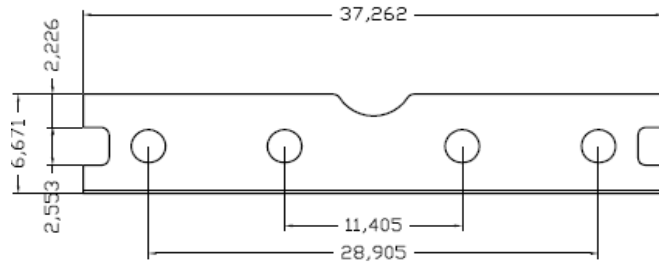


Figure 3a --

Secondary Blade for Washthrough Razor

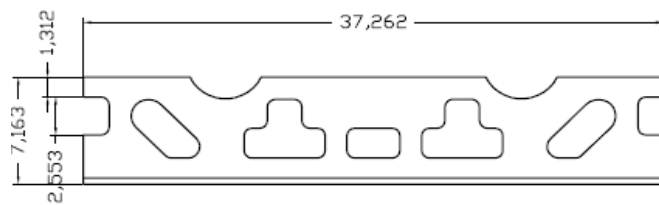


Figure 3b --

Primary Blade for Washthrough Razor

All dimensions in mm

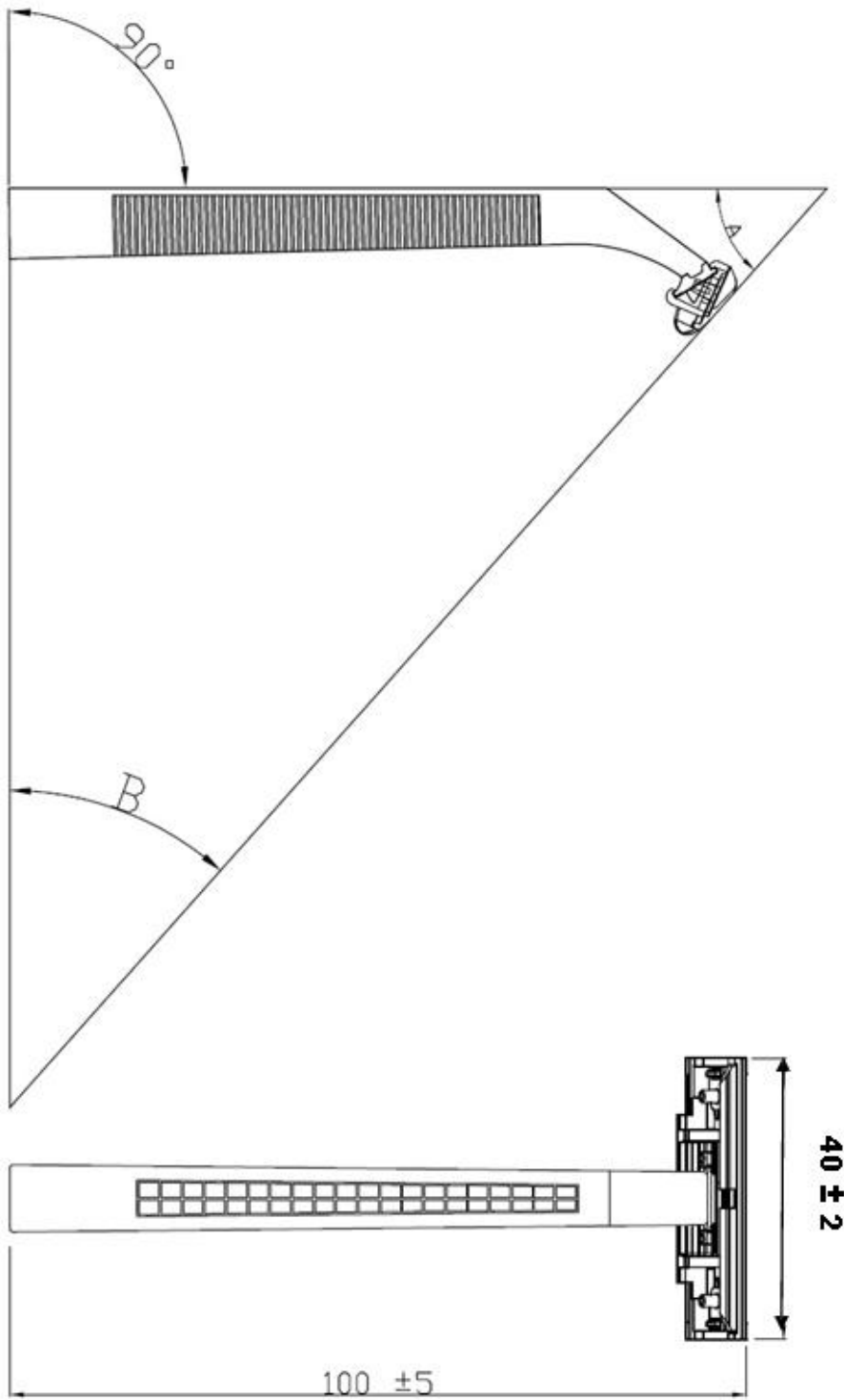


Figure 4A: Regular Disposable Razor with Single or Twin Blade

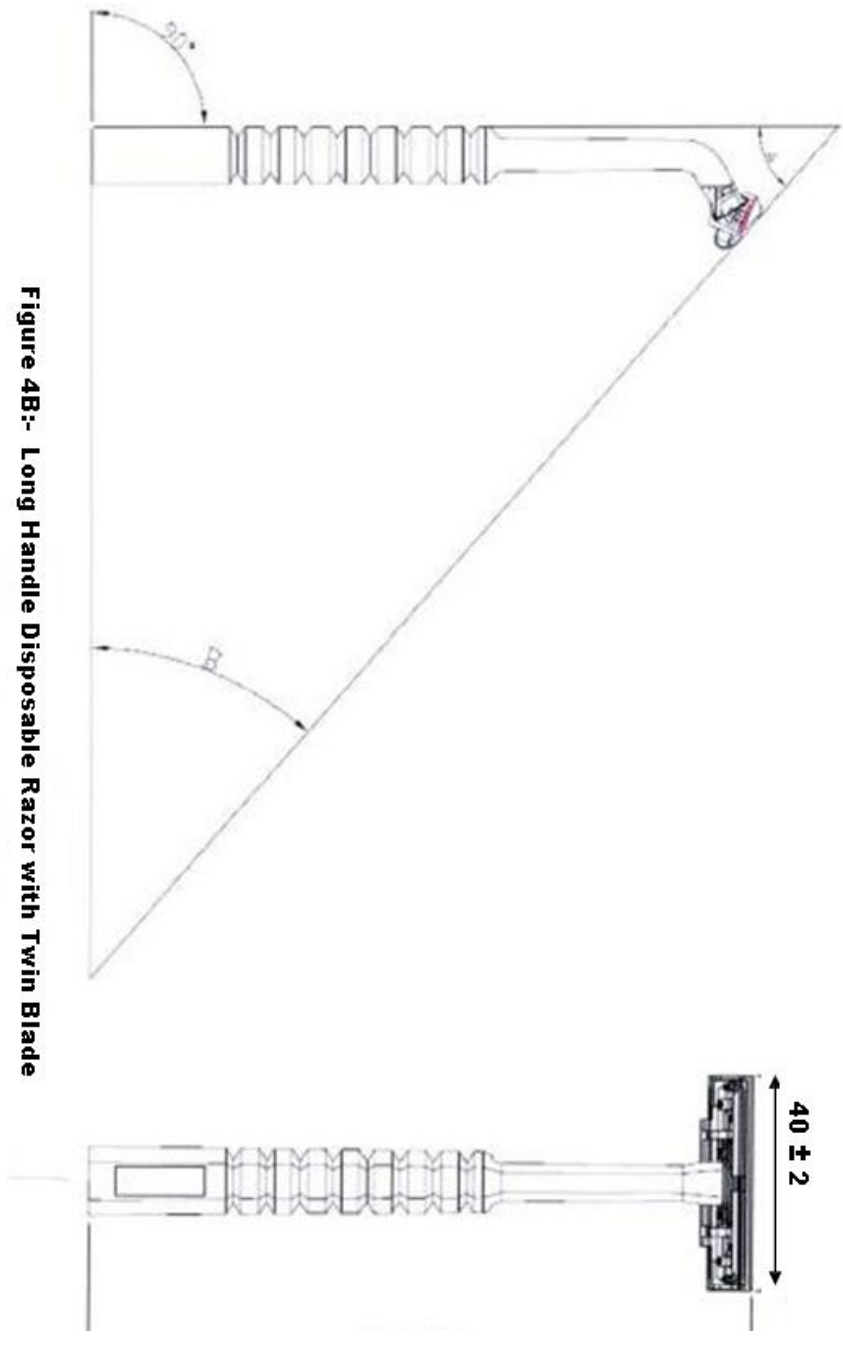


Figure 4B:- Long Handle Disposable Razor with Twin Blade

TABLE – 2: Sample size code letters (See 6.3 and 6.4)

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 3 — Single sampling plans for normal inspection

Sample size code letter	Acceptance quality limit, AQL, in percent nonconforming items and nonconformities per 100 items (normal inspection)																					
	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	1000	
A	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
B	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
D	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
E	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
F	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
G	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
H	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
J	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
K	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
L	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
M	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315
N	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
P	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Q	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
R	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

↘ Use the first sampling plan below the arrow. If sample size equals, or exceeds, lot size, carry out 100% inspection.
 ↙ Use the first sampling plan above the arrow.
 Ac = Acceptance number
 Re = Rejection number

Table-4; Chemical Composition

Stainless Steel Strip For Single and Multiple Blade Plastic Bonded Disposable Razors					
c	si	Mn	Cr	s	p
0.65~0.70%	0.20~0.50%	0.80%(Max)	12.50~13.70%	0.025%(Max)	0.025%(Max)