SIRIM QAS Sdn. Bhd. (Company No. : 410334-X)
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TEST REPORT

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Issued by	:	**Mechanical Product Testing Section, Testing Services**
Issued date	:	23 JAN 2001
Product	:	1-way lab. water tap, 2-way lab. water tap and 3-way lab. water tap
Reference Standard/ Method of test	:	BS 5412 – Specification for Low-resistance single taps and combination tap assemblies (nominal size ½ and ¾) suitable for operation at PN 10 max. and a minimum flow pressure of 0.01 MPa (0.1 bar).
Applicant	:	METHOD ENTERPRISE SDN. BHD. No. 6, Jalan Anggerik Mokara, 31/58 Kota Kemuning, Seksyen 31, 40460 Shah Alam, Selangor Darul Ehsan. (Attn. : Dr. Wan Ahmad)
Description of sample	:	Brand/Model : Method Quantity : 18 units
Date received	:	14/12/2000
Job No.	:	00TSD3485

Approved Signatories

.....
(NIK B. MD. RIFFIN)
Senior Technical Executive

SIRIM QAS SDN. BHD. Mechanical Product Testing Testing Services Department

.....
(SUHAIMI MAHMOOD)
Manager
Mechanical Product Testing Section

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Sample reference : 1-way laboratory water tap

BS 5412 : 1996	Results/Observations
5 MARKING AND IDENTIFICATION	
5.1 Marking	
Taps shall be marked in a permanent and legible fashion a) Manufacturer's name or Identification : b) No. of the Std. :	METHOD. Not provided.
6 MATERIALS	
6.1 Chemical and hygiene requirements	
All materials coming into contact with water intended for human consumption shall not present any health risk up to a temperature of 90 °C. They shall not cause any change to the drinking water in terms of quality, appearance, smell or taste. All non-metallic materials shall conform to BS 6920: Parts 1, 2 and 3.	No material was provided by manufacture.
6.2 Exposed surface conditions	
Taps components shall be supplied in one of the following conditions: a) nickel and chromium plated b) as moulded (plastic) c) Finish ordered by purchaser	Finish ordered by purchaser.
Plated with nickel & Chromium plated, coatings shall conform to BS EN 248, for clause 7.1 which stated that the tap will be salt spraying for 200 h, including a rest period of 48 h half way through the treatment, that is after the first 100 h of spraying.	Not applicable.

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BS 5412 : 1996	Results/Observations
7 DIMENSIONAL CHARACTERISTICS	
7.1 Inlet Connections	
It shall be machined at its entry to the dimension shown in Fig. 2 and Table 1.	Refer to Table 1
7.2 Single Taps	
The dimension shall be accordance in Table 4 in the standard.	Refer to Table 2
7.7 Nozzle outlets to accept jet regulators	The nozzle outlet was not designed to accept jet regulator
7.8 Replacement Seating washers	
When a resilient washer is employed, its dimension shall be determined by the manufacturer, however, for replacement purposes, the tap shall be capable of accepting one of the washer in fig. 11.	Refer to Table 3.

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BS 5412 : 1996	Results/Observations
8 WATERTIGHTNESS CHARACTERISTICS	
8.2.2 Checking the watertightness of the obturator on seat and the watertightness of the tap upstream of obturator	
(i) *Water Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and apply a water pressure of 1.6 MPa ± 0.15 MPa for 60 s ± 5 s.	a) watertightness of the obturator - **No leakage** past the obturator was observed. b) watertightness upstream - **No leakage or seepage** through the walls was observed.
(ii) *Air Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and completely immerse the tap in the water. Apply an air pressure of 0.6 MPa ± 0.05 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.
8.2.3 Checking the watertightness of the downstream of obturator	
(i) *Water Test* The outlet orifice artificially closed, open the obturator and apply a water pressure of 0.4 MPa ± 0.05 MPa for 60 s ± 5 s. then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No leakage or seepage** through the seals was observed.
(ii) *Air Test* The outlet orifice artificially closed, open the obturator and completely immerse the tap in the water. Apply an air pressure of 0.2 MPa ± 0.02 MPa for 20 s ± 2 s then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.

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BS 5412 : 1996	Results/Observations
9 PRESSURE RESISTANCE CHARACTERISTICS	
9.2.2 Checking of mechanical behaviour upstream - Obturator in the shut position	
Apply for 60 s ± 5 s a static water pressure of 2.5 MPa ± 0.05 MPa.	**No deformation or leakage** was observed.
9.2.3 Checking of Mechanical behaviour downstream - Obturator in the open position	
For tap without jet regulator, apply for 60 s ± 5 s a flow pressure of 0.4 MPa ± 0.04 MPa.	**No permanent deformation** was observed.
10 HYDRAULIC CHARACTERISTIC	
Open the tap to its maximum. Connect the water supply to the test apparatus and adjust the flow pressure to 0.01 MPa.	
Flow rate for 1/2 " single tap : 7.5 *l*/m The test is not applicable to combination taps for ascending spray bidets or when the customer requires special design outlets e.g. bottle filling.	Average flow rate : 3.62*l*/m
11 MECHANICAL STRENGTH CHARACTERISTIC	
Apply a torque of 6 N.m for a period 5 min. to the operating mechanism in both opening and closing positions but with the seat removed.	Opening position - **No permanent deformation or loosening** of any part of the valve was observed. Closing position - **No permanent deformation or loosening** of any part of the valve was observed.

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Table 1 : Dimension of tap (See Appendix A1, page 9 of 31)

Dimension	BS 5412 : 1996	Results/Observations
A	G ½ B	G ½ B
N_1	-	14.61*
N_3	-	20.69

* The tap was not machined to any designs shown in figure 2
Note : All dimensions are in millimetres

Table 2 : Dimension of the tap (See Appendix B1, page 10 of 31)

Dimension	BS 5412 : 1996	Results/Observations
D min.	100 (moveable nozzle)	157.34
E min.	125 (moveable nozzle)	224.29
G min.	45	50.26
G_1 min.	External diameter, 50	42.18
J max.	33.5	20.70
K	-	2.82
V max.	32	25.14

Note : All dimensions are in millimetres

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Table 3 : Dimension of Manufacturer's washer (See Appendix C1, page 11 of 31)

Dimension	Results/Observations
Thickness	3.47
Internal diameter	4.80
External diameter	15.82

Note : i) All dimensions are in millimetres

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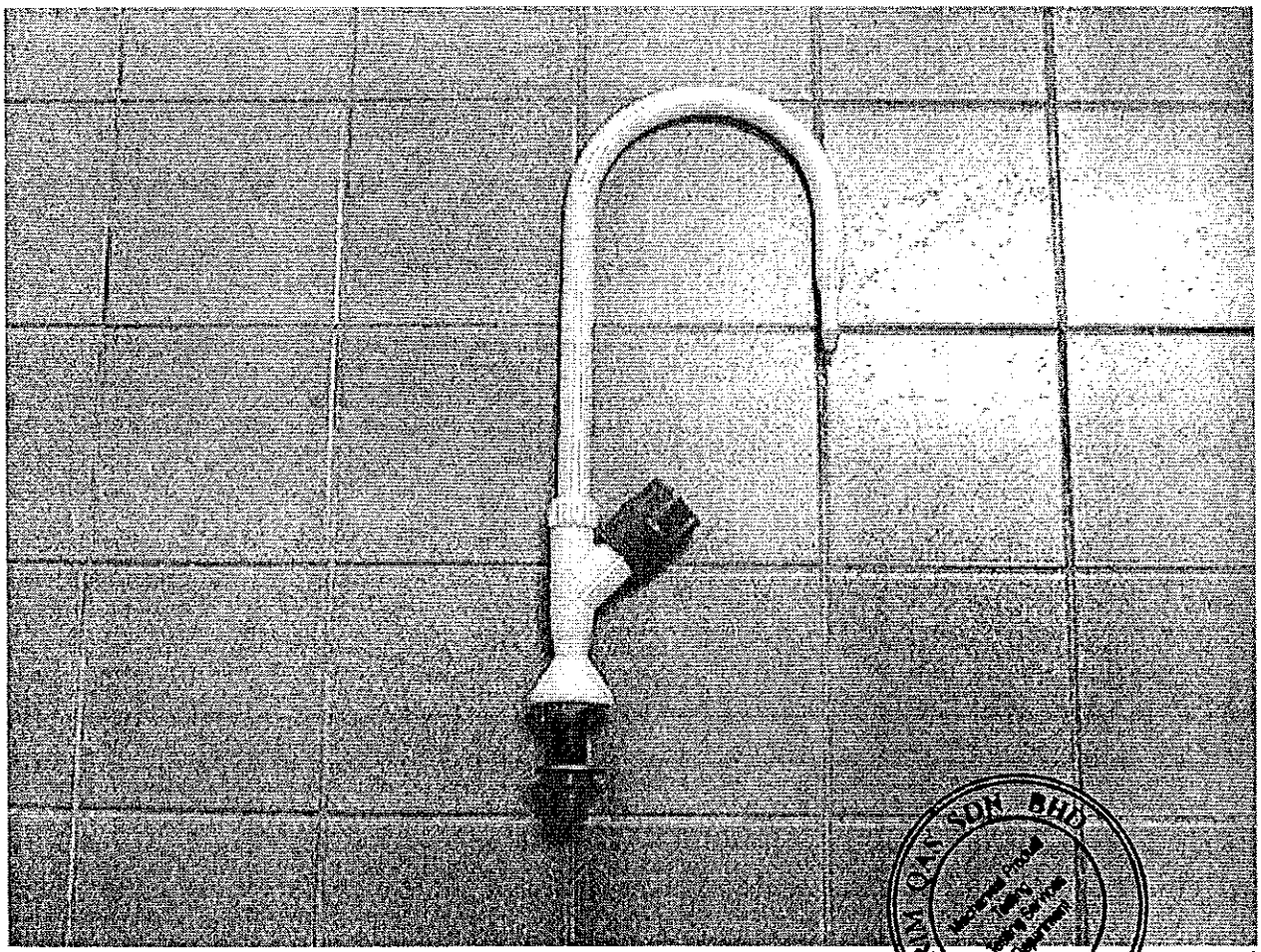

Photograph of 1-way laboratory water tap

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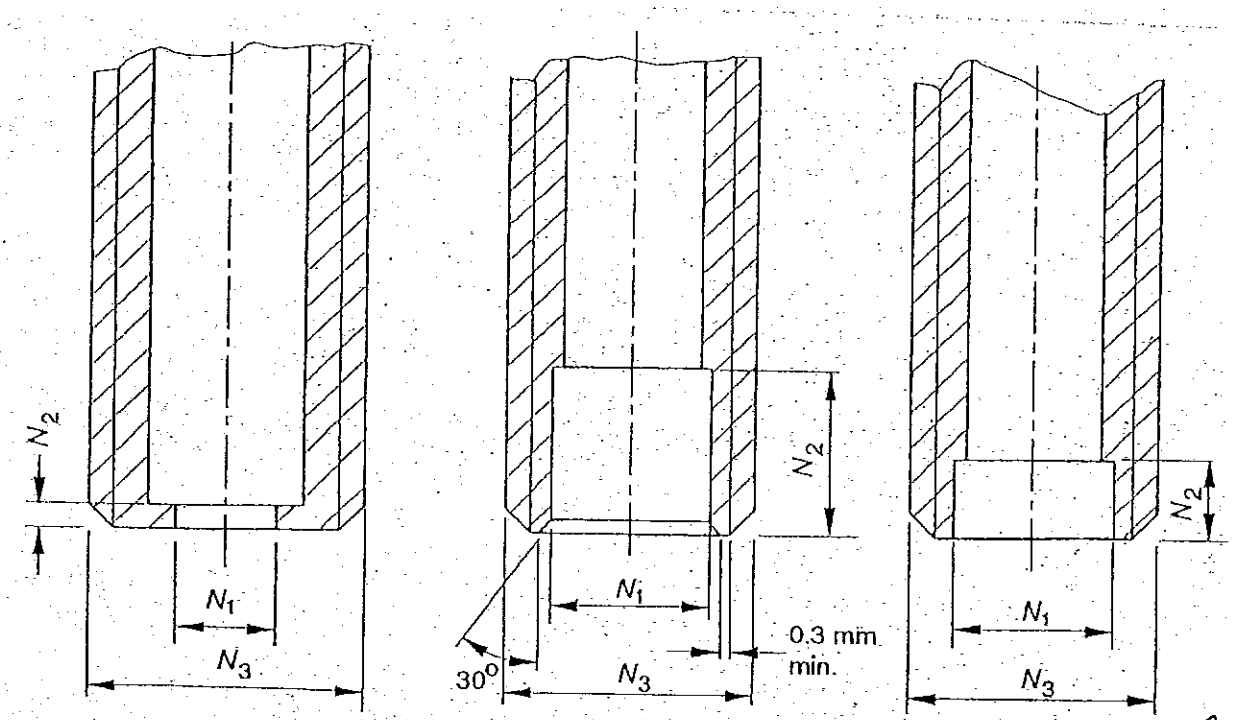
APPENDIX A1



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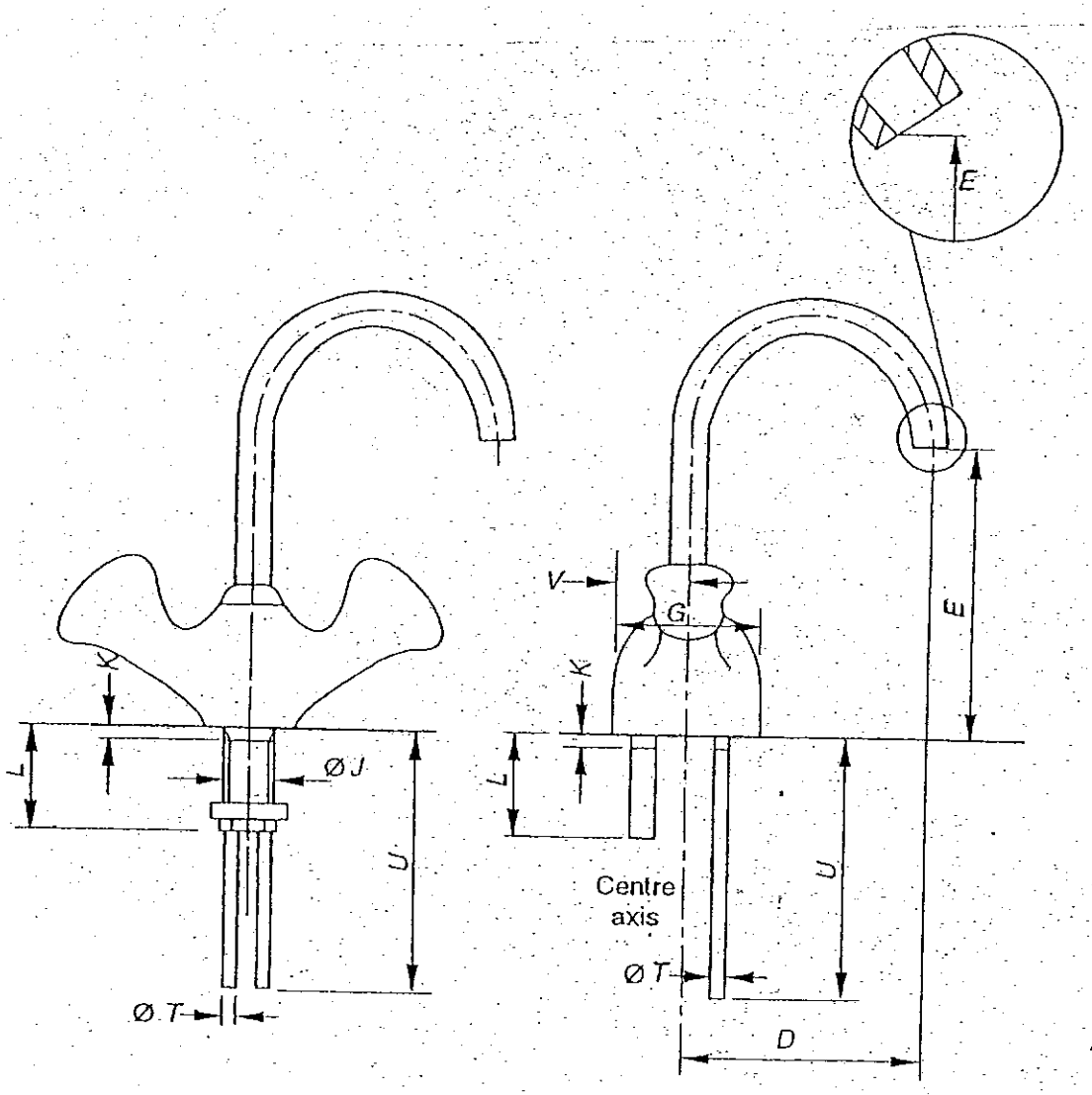
APPENDIX B1



a) With threaded shank fixing

b) With stud fixing

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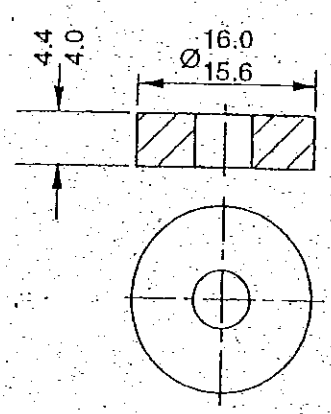
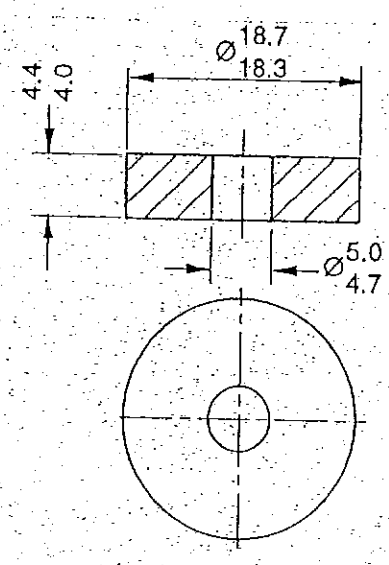
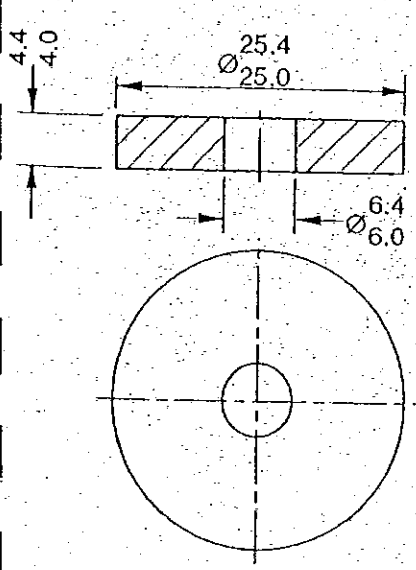
APPENDIX C1



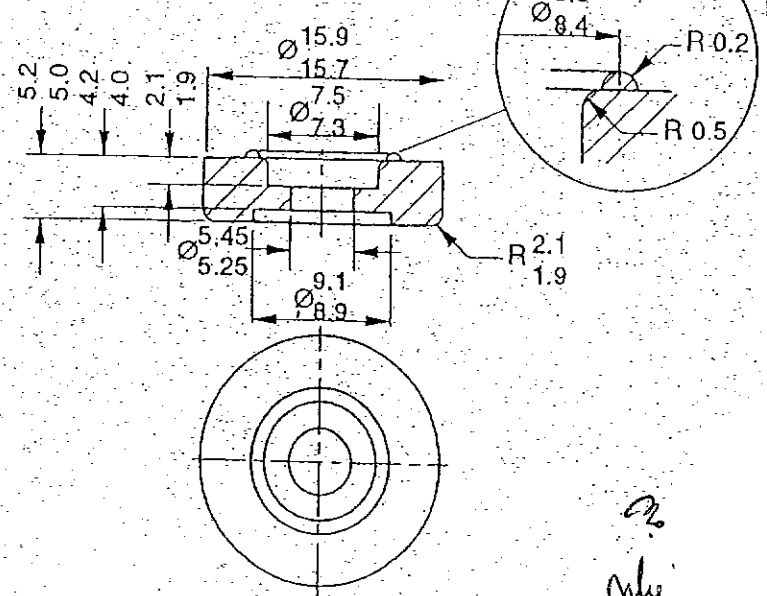
a) Type 1 washer



b) Type 2 washer



c) Type 3 washer



d) Type 4 washer

All dimensions are in millimetres.

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Sample reference : 2-way laboratory water tap

BS 5412 : 1996	Results/Observations
5 MARKING AND IDENTIFICATION	
5.1 Marking	
Taps shall be marked in a permanent and legible fashion a) Manufacturer's name or Identification : b) No. of the Std. :	METHOD. Not provided.
6 MATERIALS	
6.1 Chemical and hygiene requirements	
All materials coming into contact with water intended for human consumption shall not present any health risk up to a temperature of 90 °C. They shall not cause any change to the drinking water in terms of quality, appearance, smell or taste. All non-metallic materials shall conform to BS 6920: Parts 1, 2 and 3.	No material was provided by manufacture.
6.2 Exposed surface conditions	
Taps components shall be supplied in one of the following conditions: a) nickel and chromium plated b) as moulded (plastic) c) Finish ordered by purchaser	Finish ordered by purchaser.
Plated with nickel & Chromium plated, coatings shall conform to BS EN 248, for clause 7.1 which stated that the tap will be salt spraying for 200 h, including a rest period of 48 h half way through the treatment, that is after the first 100 h of spraying.	Not applicable.

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BS 5412 : 1996	Results/Observations
7 DIMENSIONAL CHARACTERISTICS	
7.1 Inlet Connections	
It shall be machined at its entry to the dimension shown in Fig. 2 and Table 1.	Refer to Table 1.
7.2 Single Taps	
The dimension shall be accordance in Table 4 in the standard.	Refer to Table 2.
7.7 Nozzle outlets to accept jet regulators	The nozzle outlet was not designed to accept jet regulator.
7.8 Replacement Seating washers	
When a resilient washer is employed, its dimension shall be determined by the manufacturer, however, for replacement purposes, the tap shall be capable of accepting one of the washer in fig. 11.	Refer to Table 3.

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BS 5412 : 1996	Results/Observations
8 WATERTIGHTNESS CHARACTERISTICS	
8.2.2 Checking the watertightness of the obturator on seat and the watertightness of the tap upstream of obturator	
(i) *Water Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and apply a water pressure of 1.6 MPa ± 0.15 MPa for 60 s ± 5 s.	a) watertightness of the obturator - **No leakage** past the obturator was observed. b) watertightness upstream - **No leakage or seepage** through the walls was observed.
(ii) *Air Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and completely immerse the tap in the water. Apply an air pressure of 0.6 MPa ± 0.05 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.
8.2.3 Checking the watertightness of the downstream of obturator	
(i) *Water Test* The outlet orifice artificially closed, open the obturator and apply a water pressure of 0.4 MPa ± 0.05 MPa for 60 s ± 5 s. then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No leakage or seepage** through the seals was observed.
(ii) *Air Test* The outlet orifice artificially closed, open the obturator and completely immerse the tap in the water. Apply an air pressure of 0.2 MPa ± 0.02 MPa for 20 s ± 2 s then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.

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BS 5412 : 1996	Results/Observations
9 PRESSURE RESISTANCE CHARACTERISTICS	
9.2.2 Checking of mechanical behaviour upstream - Obturator in the shut position	
Apply for 60 s ± 5 s a static water pressure of 2.5 MPa ± 0.05 MPa.	**No deformation or leakage** was observed.
9.2.3 Checking of Mechanical behaviour downstream - Obturator in the open position	
For tap without jet regulator, apply for 60 s ± 5 s a flow pressure of 0.4 MPa ± 0.04 MPa.	**No permanent deformation** was observed.
10 HYDRAULIC CHARACTERISTIC	
Open the tap to its maximum. Connect the water supply to the test apparatus and adjust the flow pressure to 0.1 MPa.	
Flow rate for 1/2 " single tap : 7.5 *l*/m The test is not applicable to combination taps for ascending spray bidets or when the customer requires special design outlets e.g. bottle filling.	Average flow-rate: left are 3.85*l*/m. right are 3.85*l*/m.
11 MECHANICAL STRENGTH CHARACTERISTIC	
Apply a torque of 6 N.m for a period 5 min. to the operating mechanism in both opening and closing positions but with the seat removed.	Opening position - **No permanent deformation or loosening** of any part of the valve was observed. Closing position - **No permanent deformation or loosening** of any part of the valve was observed.

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Table 1 : Dimension of tap (See Appendix A2, page 19 of 31)

Dimension	BS 5412 : 1996	Results/Observations
A	G ½ B	G ½ B
N_1	-	14.61*
N_3	-	20.71

* The tap was not machined to any designs shown in figure 2
Note : All dimensions are in millimetres

Table 2 : Dimension of the tap (See Appendix B2, page 20 of 31)

Dimension	BS 5412 : 1996	Results/Observations
D min.	90 (fixed nozzle)	171.14 (left) and 172.42 (right)
E min.	20 (fixed nozzle)	223.09 (left) and 222.95 (right)
G min.	45	50.36
G_1 min.	External diameter, 50	42.20
J max.	33.5	20.71
K	-	3.15
V max.	32	25.20

Note : All dimensions are in millimetres

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Table 3 : Dimension of Manufacturer's washer (See Appendix C2, page 21 of 31)

Dimension	Results/Observations
Thickness	3.49
Internal diameter	4.93
External diameter	15.87
Note : i) All dimensions are in millimetres	

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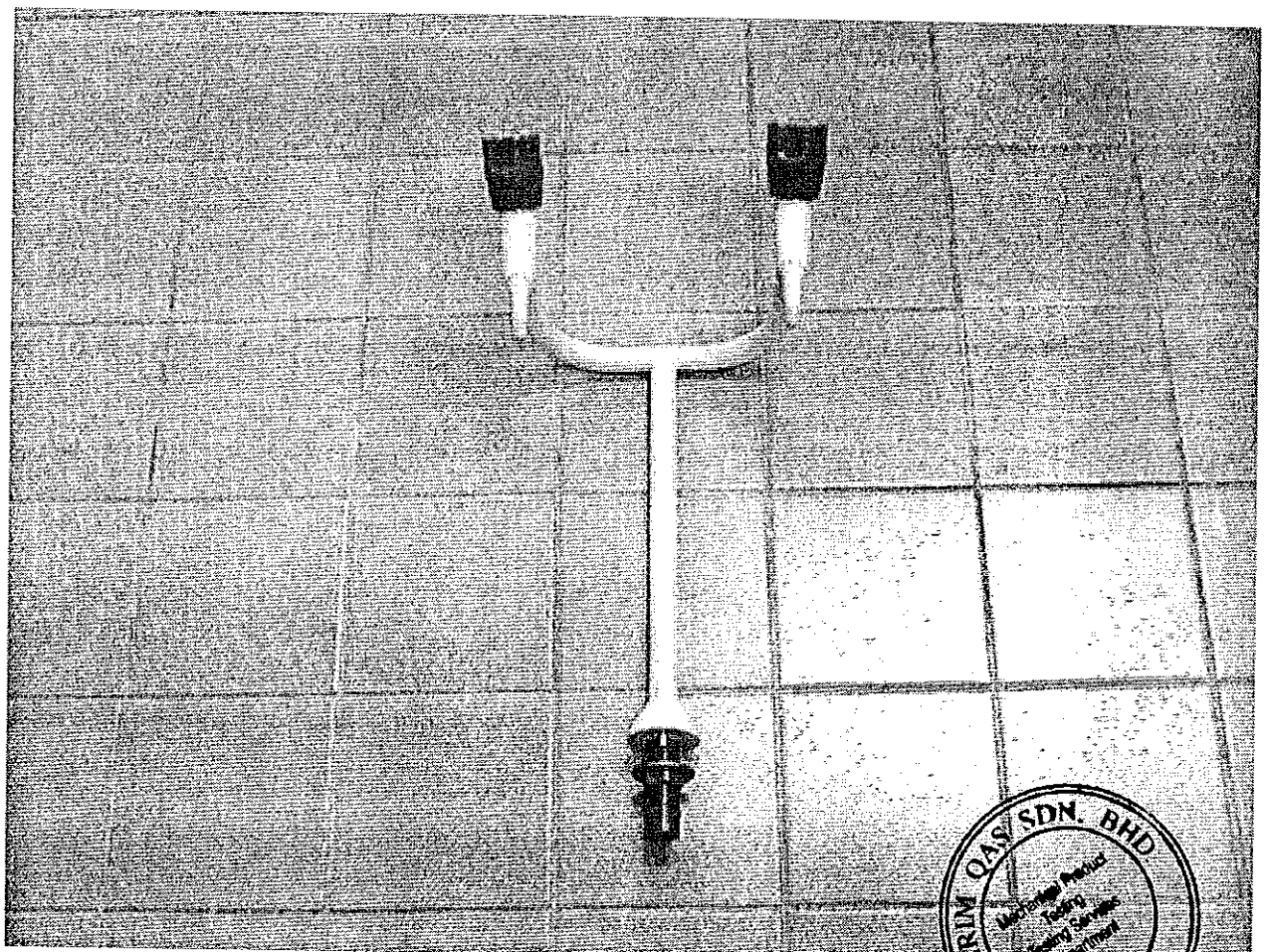

Photograph of 2-way laboratory water tap

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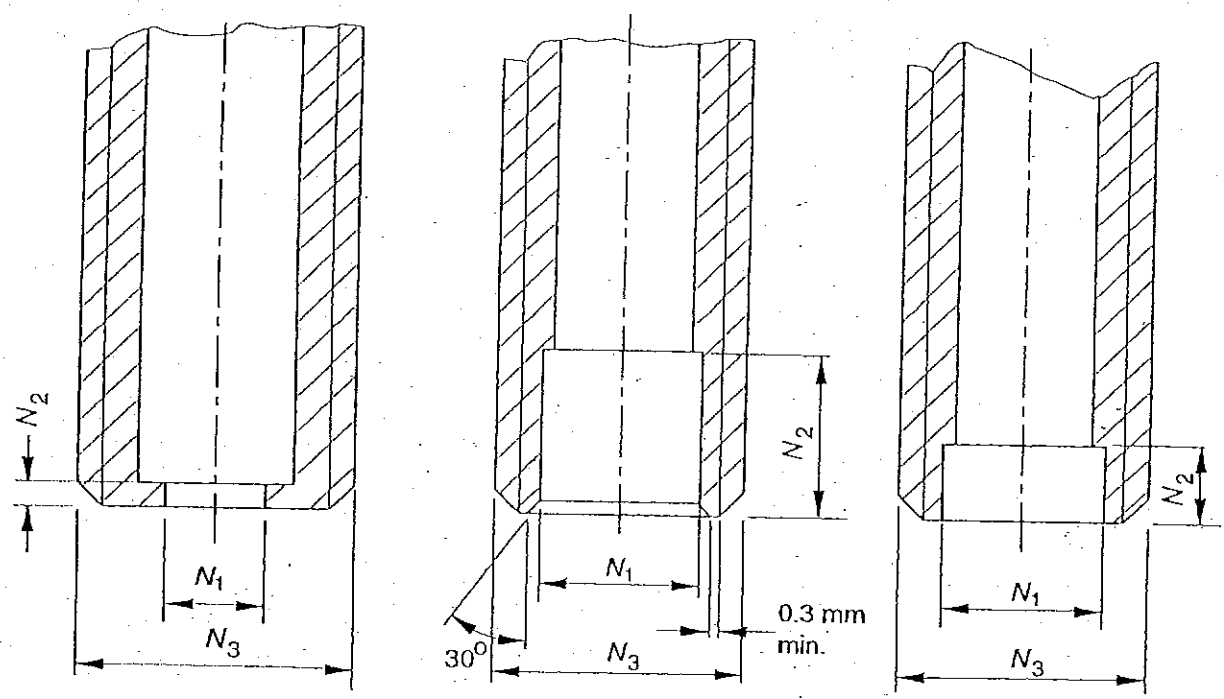
APPENDIX A2



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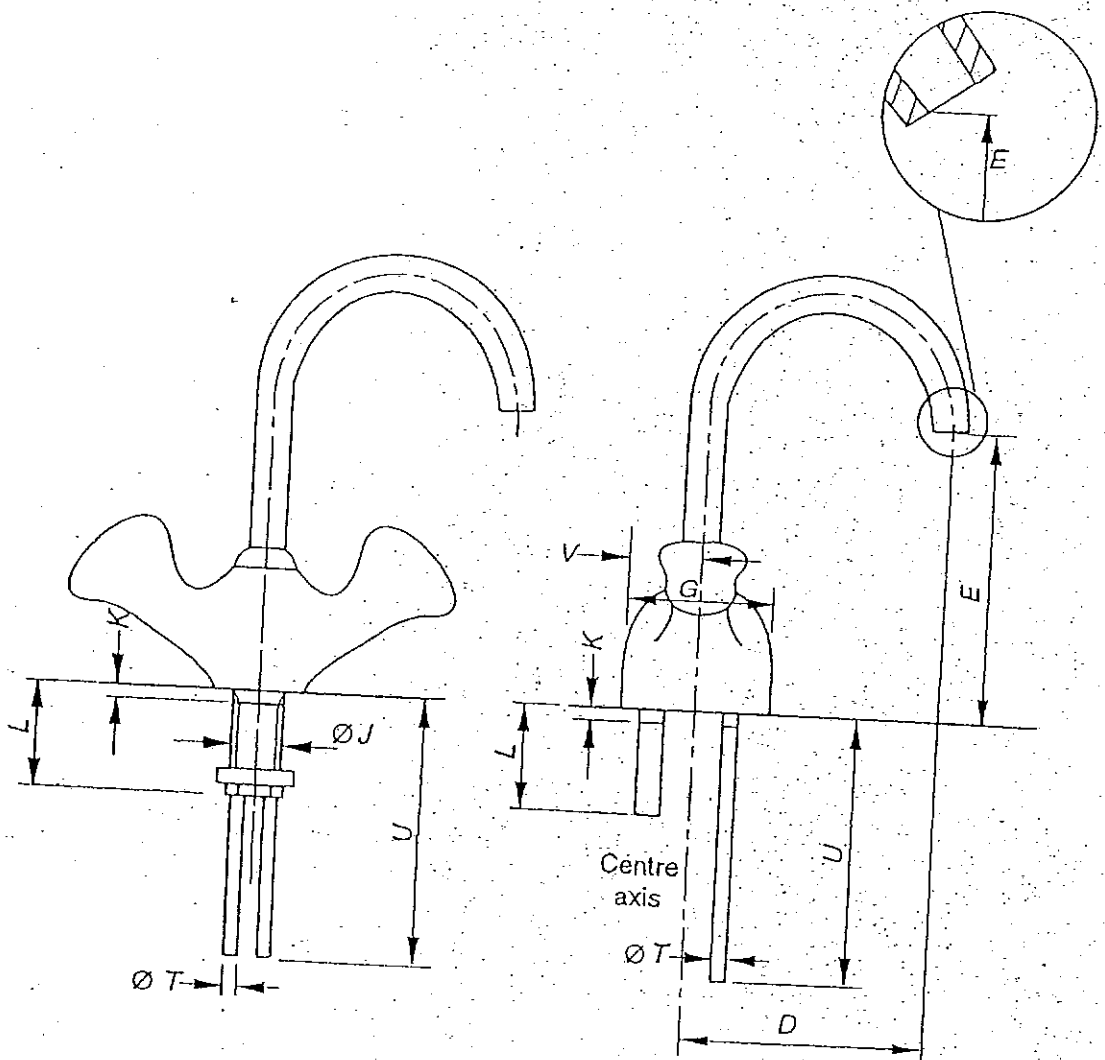
APPENDIX B2



a) With threaded shank fixing

b) With stud fixing

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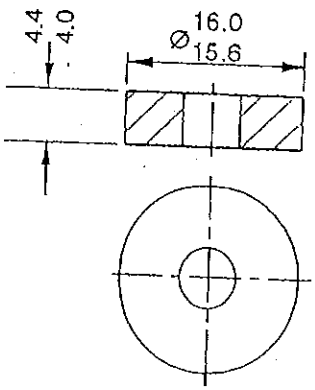
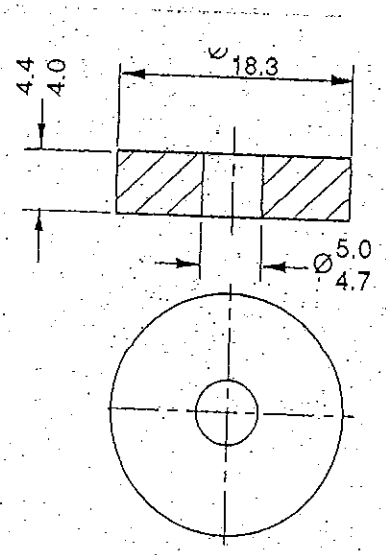
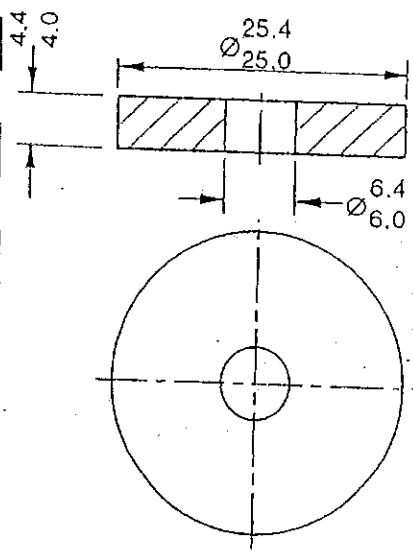
APPENDIX C2



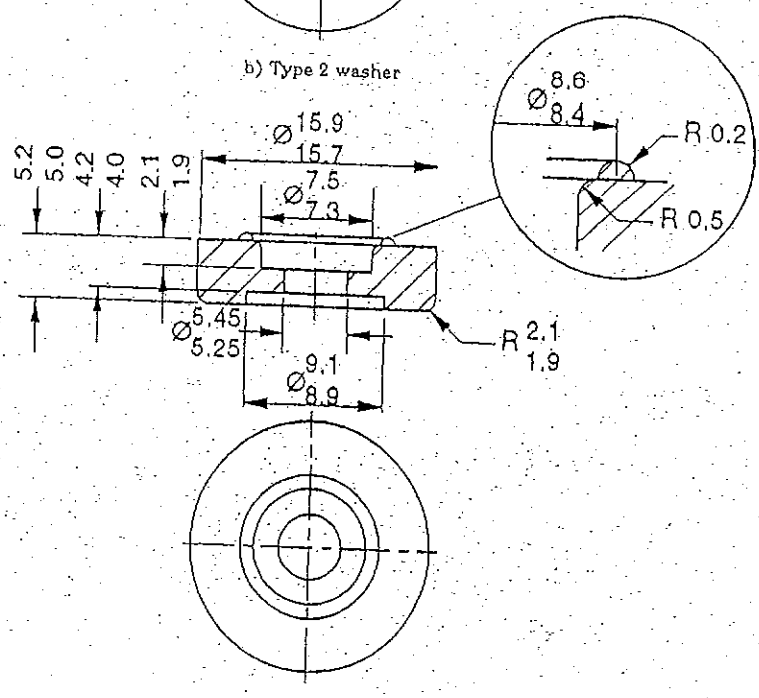
a) Type 1 washer



b) Type 2 washer



c) Type 3 washer



d) Type 4 washer

All dimensions are in millimetres.

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Sample reference : 3-way laboratory water tap

BS 5412 : 1996	Results/Observations
5 MARKING AND IDENTIFICATION	
5.1 Marking	
Taps shall be marked in a permanent and legible fashion a) Manufacturer's name or Identification : b) No. of the Std. :	METHOD. Not provided.
6 MATERIALS	
6.1 Chemical and hygiene requirements	
All materials coming into contact with water intended for human consumption shall not present any health risk up to a temperature of 90 °C. They shall not cause any change to the drinking water in terms of quality, appearance, smell or taste. All non-metallic materials shall conform to BS 6920: Parts 1, 2 and 3.	No material was provided by manufacture.
6.2 Exposed surface conditions	
Taps components shall be supplied in one of the following conditions: a) nickel and chromium plated b) as moulded (plastic) c) Finish ordered by purchaser	Finish ordered by purchaser.
Plated with nickel & Chromium plated, coatings shall conform to BS EN 248, for clause 7.1 which stated that the tap will be salt spraying for 200 h, including a rest period of 48 h half way through the treatment, that is after the first 100 h of spraying.	Not applicable.

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BS 5412 : 1996	Results/Observations
7 DIMENSIONAL CHARACTERISTICS	
7.1 Inlet Connections	
It shall be machined at its entry to the dimension shown in Fig. 2 and Table 1.	Refer to Table 1.
7.2 Single Taps	
The dimension shall be accordance in Table 4 in the standard.	Refer to Table 2.
7.7 Nozzle outlets to accept jet regulators	The nozzle outlet was not designed to accept jet regulator.
7.8 Replacement Seating washers	
When a resilient washer is employed, its dimension shall be determined by the manufacturer, however, for replacement purposes, the tap shall be capable of accepting one of the washer in fig. 11.	Refer to Table 3.

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BS 5412 : 1996	Results/Observations
8 WATERTIGHTNESS CHARACTERISTICS	
8.2.2 Checking the watertightness of the obturator on seat and the watertightness of the tap upstream of obturator	
(i) *Water Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and apply a water pressure of 1.6 MPa ± 0.15 MPa for 60 s ± 5 s.	a) watertightness of the obturator - **No leakage** past the obturator was observed. b) watertightness upstream - **No leakage or seepage** through the walls was observed.
(ii) *Air Test* The outlet orifice open, close the obturator using a torque of 1.5 N.m and completely immerse the tap in the water. Apply an air pressure of 0.6 MPa ± 0.05 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.
8.2.3 Checking the watertightness of the downstream of obturator	
(i) *Water Test* The outlet orifice artificially closed, open the obturator and apply a water pressure of 0.4 MPa ± 0.05 MPa for 60 s ± 5 s. then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No leakage or seepage** through the seals was observed.
(ii) *Air Test* The outlet orifice artificially closed, open the obturator and completely immerse the tap in the water. Apply an air pressure of 0.2 MPa ± 0.02 MPa for 20 s ± 2 s then gradually reduce to 0.02 MPa ± 0.002 MPa for 20 s ± 2 s.	**No escape** of air bubbles from the sample was observed.

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BS 5412 : 1996	Results/Observations
9 PRESSURE RESISTANCE CHARACTERISTICS	
9.2.2 Checking of mechanical behaviour upstream - Obturator in the shut position	
Apply for 60 s ± 5 s a static water pressure of 2.5 MPa ± 0.05 MPa.	**No deformation or leakage** was observed.
9.2.3 Checking of Mechanical behaviour downstream - Obturator in the open position	
For tap without jet regulator, apply for 60 s ± 5 s a flow pressure of 0.4 MPa ± 0.04 MPa.	**No permanent deformation** was observed.
10 HYDRAULIC CHARACTERISTIC	
Open the tap to its maximum. Connect the water supply to the test apparatus and adjust the flow pressure to 0.1 MPa.	
Flow rate for 1/2 " single tap : 7.5 *l*/m The test is not applicable to combination taps for ascending spray bidets or when the customer requires special design outlets e.g. bottle filling.	Average flow-rate: left are 3.61*l*/m. right are 3.68*l*/m. top are 3.46*l*/m.
11 MECHANICAL STRENGTH CHARACTERISTIC	
Apply a torque of 6 N.m for a period 5 min. to the operating mechanism in both opening and closing positions but with the seat removed.	Opening position - **No permanent deformation or loosening** of any part of the valve was observed. Closing position - **No permanent deformation or loosening** of any part of the valve was observed.

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Table 1 : Dimension of tap (See Appendix A3, page 29 of 31)

Dimension	BS 5412 : 1996	Results/Observations
A	G ½ B	G ½ B
N_1	-	14.69*
N_3	-	20.66

* The tap was not machined to any designs shown in figure 2
Note : All dimensions are in millimetres

Table 2 : Dimension of the tap (See Appendix B3, page 30 of 31)

Dimension	BS 5412 : 1996	Results/Observations
D min.	90 (fixed nozzle) 100 (moveable nozzle)	179.36 (left, fixed nozzle), 179.30 (right, fixed nozzle) and 159.48 (top, moveable nozzle)
E min.	20 (fixed nozzle) 125 (movable nozzle)	86.86 (left, fixed nozzle),87.10 (right, fixed nozzle) and 375.15 (top, movable)
G min.	45	50.23
G_1 min.	External diameter, 50	42.18
J max.	33.5	20.66
K	-	3.97
V max.	32	25.14

Note : All dimensions are in millimetres

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Table 3 : Dimension of Manufacturer's washer (See Appendix C3, page 31 of 31)

Dimension	Results/Observations
Thickness	3.54
Internal diameter	4.90
External diameter	15.95
Note : i) All dimensions are in millimetres	

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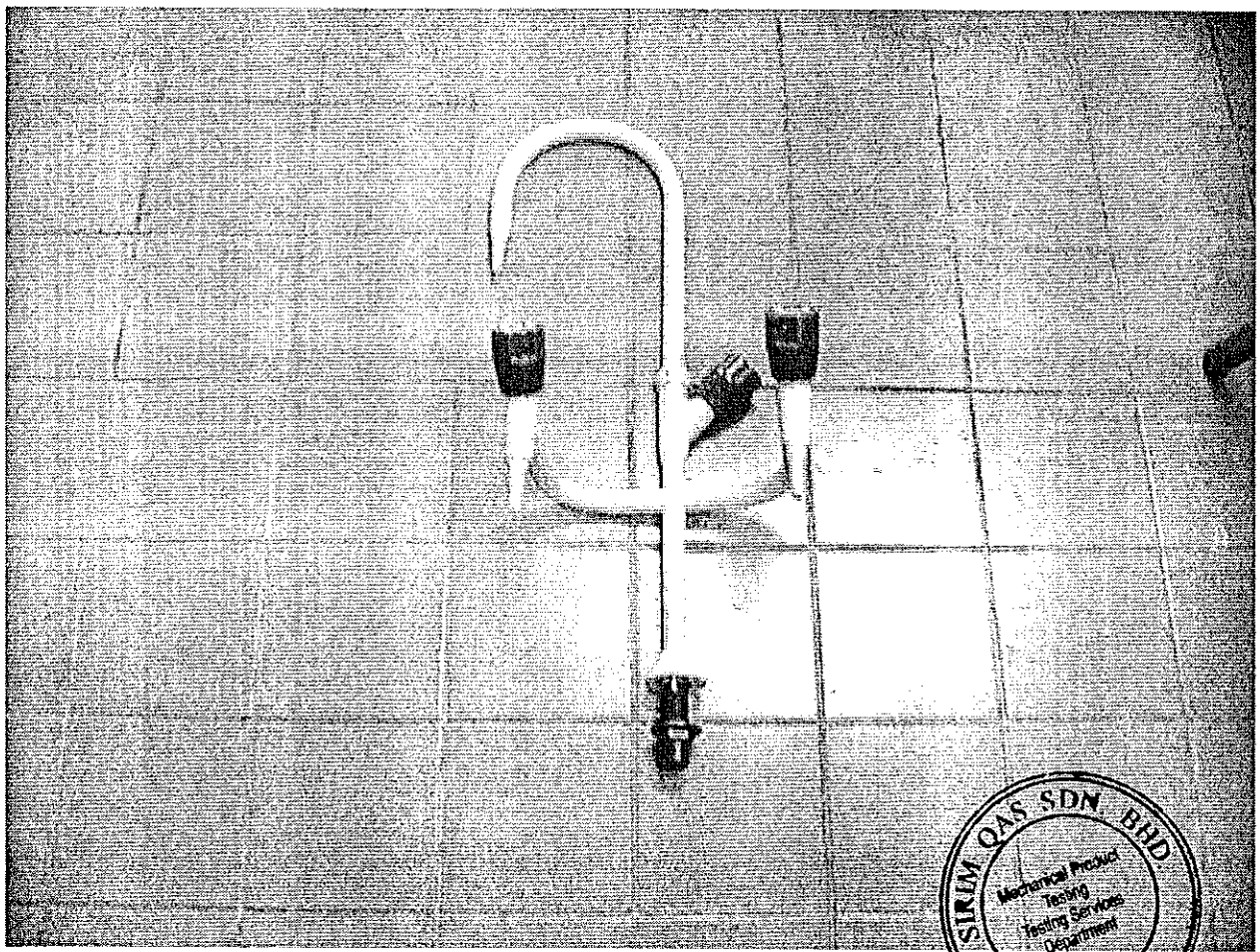

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Testing Services Department

Photograph of 3-way laboratory water tap

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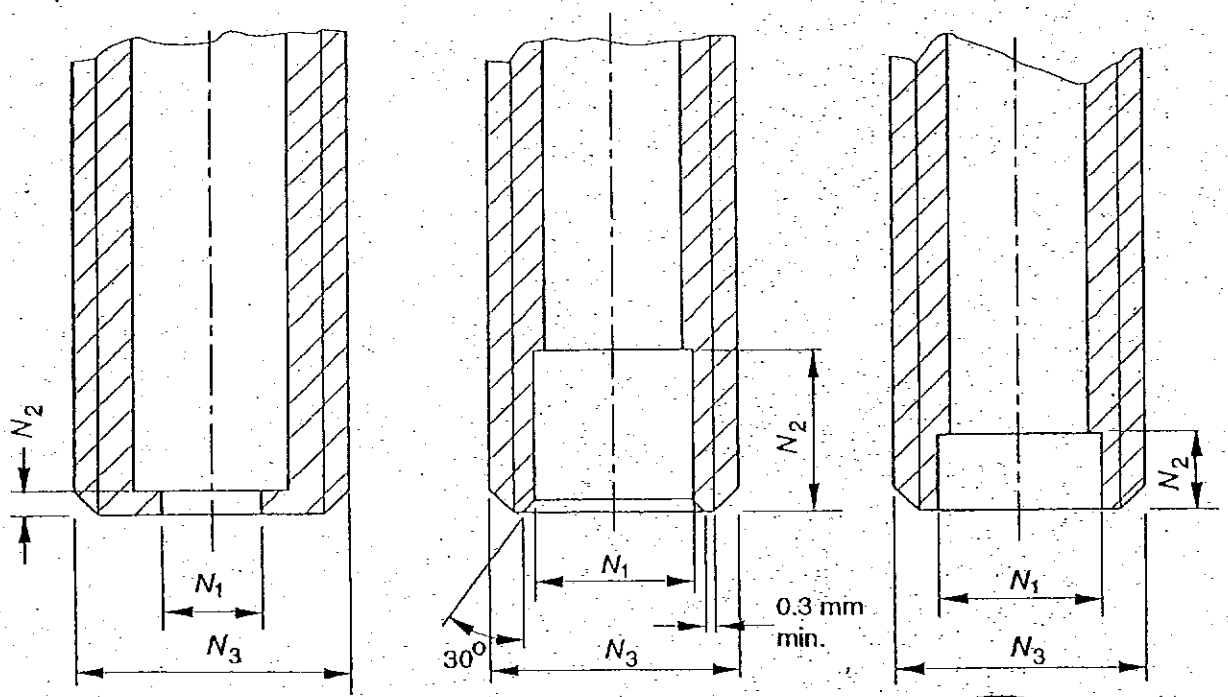
APPENDIX A1



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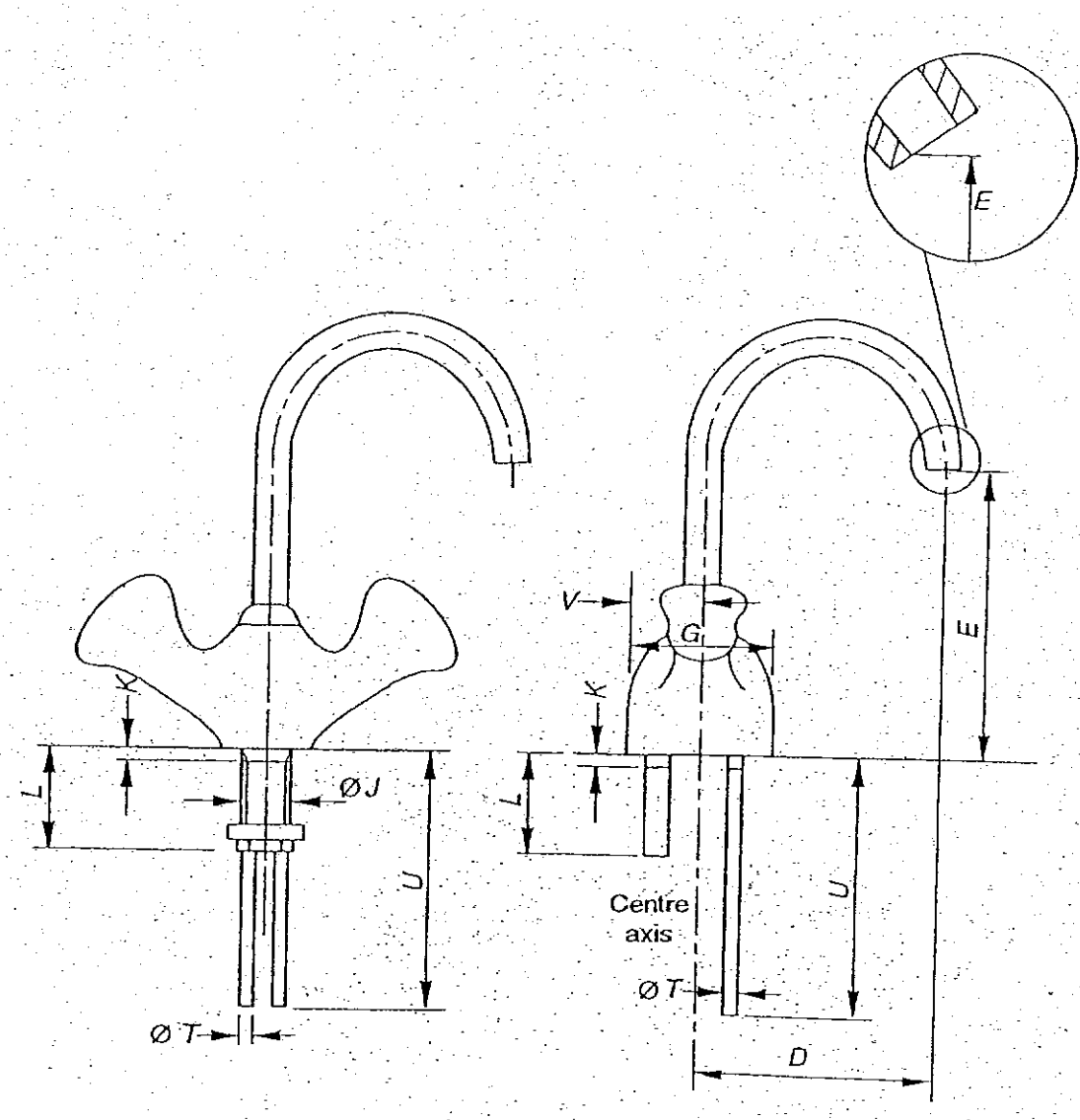
APPENDIX B1



a) With threaded shank fixing

b) With stud fixing

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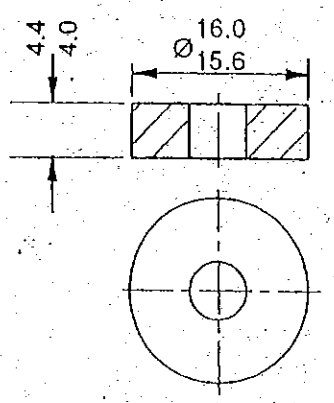
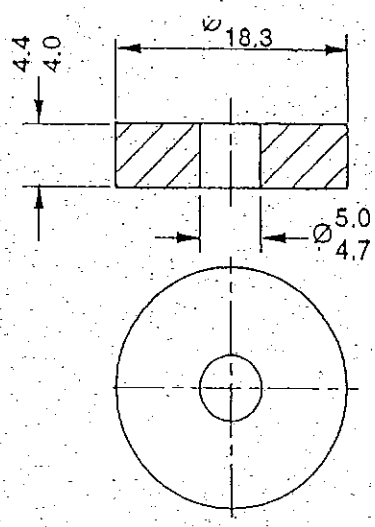
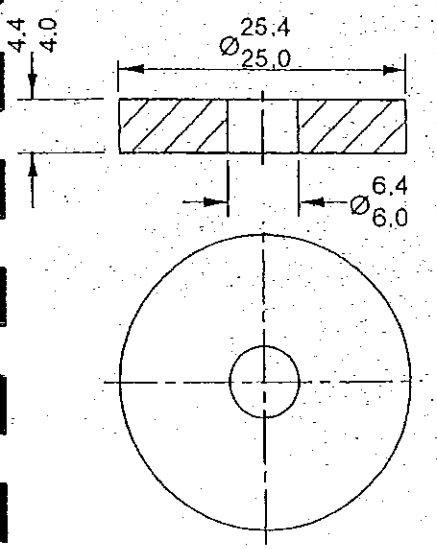
APPENDIX C1



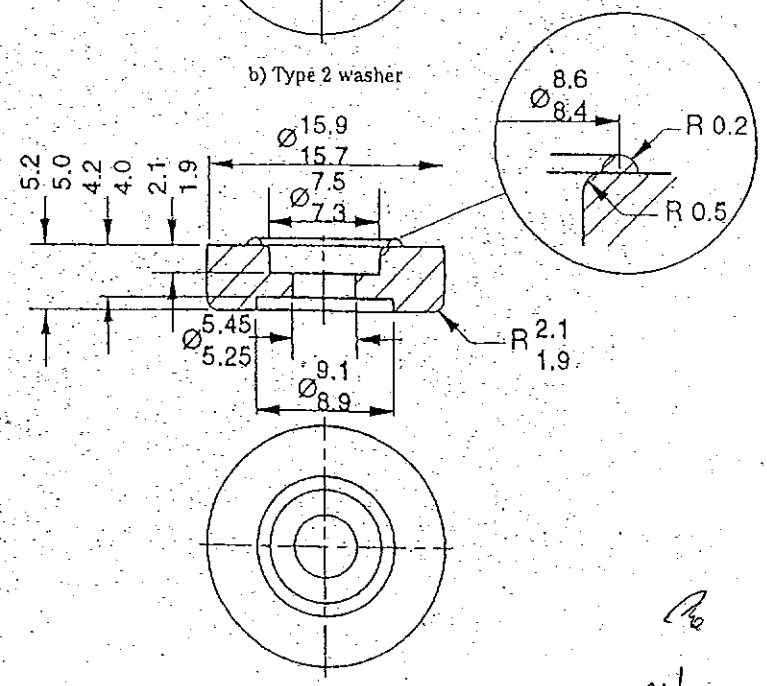
a) Type 1 washer



b) Type 2 washer



c) Type 3 washer



d) Type 4 washer

All dimensions are in millimetres.

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