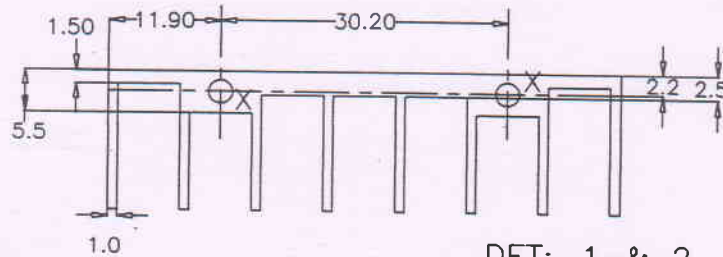
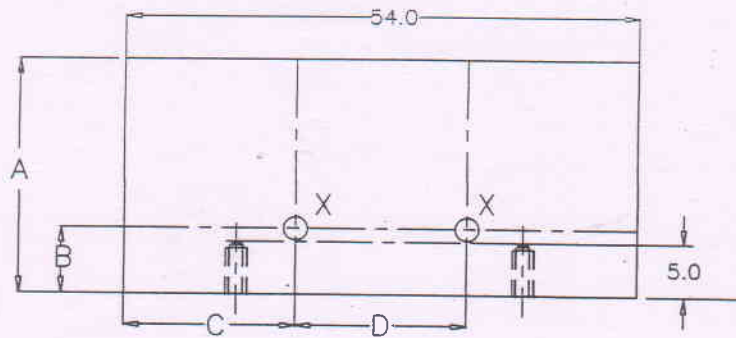


CODE	MATL.	SPEC.	FIN.	SPEC.	SHEET :-1		
DTC660249/ 1,4& 5	LENGTH TO BE CUT FROM DTC 660255/1		ANODIZED BLACK	B639B	ISSUE	APP.	
DTC660249/2,3,6&7	LENGTH TO BE CUT FROM DTC 660255/1		ANODIZED BLACK	B639B	3	25-11-11	
<p>DET-1,4&5 2-HOLES 'A' M2.5 TAPPED 2-HOLES 'B' M3 TAPPED</p>					BCOT: 91561(D) DET.3 ADDED & REDRAWN MsR		
					4	05-05-16	MSR
					BCOT: 91600(D) DET.4 ADDED AND DIMENSIONS MENTIONED IN TABLE-A		
					RRB	KSS	CNG
					5	26-07-17	CNG
					BCOT: 91608(D) DET.5 ADDED AND DIMENSIONS MENTIONED IN TABLE-A		
					RRB	KSS	CNG
					6	02-03-18	CNG
					BCOT: 91646(D) DET.6 ADDED AND DIMENSIONS MENTIONED IN TABLE-B		
					RRB	KSS	CNG
7	03-01-2020	CNG					
BCOT: 91675(D) DET.7 ADDED AND DIMENSIONS MENTIONED IN TABLE-B							
GS	KSS	CNG					
8	21-09-2020	CNG					
BCOT: 91677(D) ORG. REVISED & REDRAWN							
9	12-10-2020	CNG					
<p>DET-2, 3,6 & 7 1-HOLES 'A' M2.5 TAPPED 2-HOLES 'B' M3 TAPPED</p>					<div style="border: 1px solid black; padding: 5px; text-align: center;"> DOCUMENTATION CENTER CONTROLLED COPY 176F SIG: DATE: 6/6/24 </div>		
					TABLE-B		
					7	26.0	
					6	40.0	
					3	30.0	
					2	50.0	
					DET.NO.	DIM'C'	
					ALL DIMNS. ARE IN 'mm'		
					TOLERANCES TO RULING NO 16		
					REF:- SCADA		
W.O:- NSND-013 (152)							
U.O:- PCA 6691/A1							
<div style="display: flex; justify-content: space-between;"> <div> HEAT SINK TRANSMISSION EQUIPMENT </div> <div> DRN. RRB TRD. / CHD. </div> <div> ENG. APP. </div> <div> KSS CNG </div> </div>					I.T.I.LIMITED. BANGALORE-16.		
					A4		
					DTC 660249		

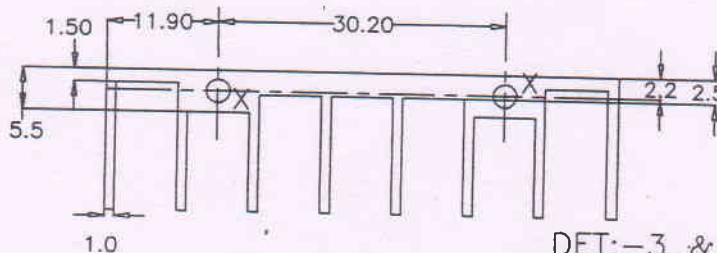
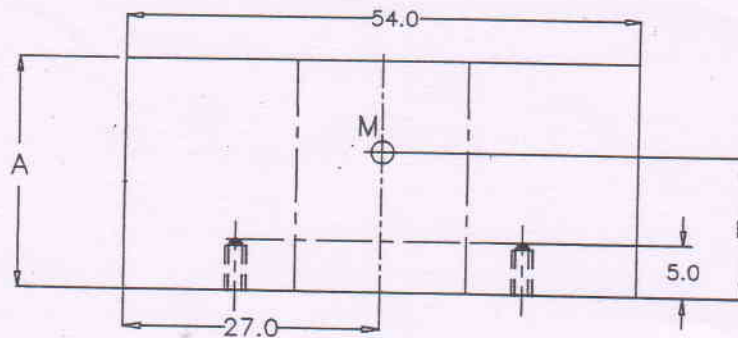
CODE	MATL.	SPEC.	FIN.	SPEC.
DTC660250/1,2,3,4	LENGTH TO BE CUT FROM DTC 660254/1	CUT FROM	ANODIZED BLACK	B639B

SHEET:- 1 OF 1		
ISSUE	APP.	
1	23-10-10	MSR
BCOT:-91646(D) DWG. REVISED & REDRAWN		
2	03-01-20	CN
BCOT:-91695(D) DET. 3 REVISED		
3	13-02-2021	PM



TYPE:TVS-8PIN

4-HOLES 'X' M2.5 TAPPED



TYPE:TVS-8PIN

2-HOLES 'X' M2.5 TAPPED
1-HOLE 'M' M3.0 TAPPED

NOTES:- 1. ALL SHARP CORNERS ARE TO BE SLIGHTLY ROUNDED.
ALL DIMENSION ARE IN "mm"

DET. NO.	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'	DIM. 'E'
4	40.0	—	—	—	12.0
3	25.0	—	—	—	12.5
2	50.0	22.0	19.0	16.0	—
1	25.0	7.0	18.0	18.0	—

HEAT SINK

TRANSMISSION EQUIPMENT

DRN. Nagendra

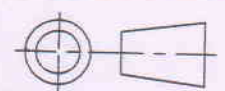
TRD. —

CHD.

ENG.

APP.

MSR



DTC660250



ITI LIMITED
BANGALORE-16.

A4

DOCUMENTATION
CENTER

CONTROLLED COPY 1/55

SIG. *Amrith*

DATE 6/6/24

ALL DIMENSIONS
IN 'mm'

TOLERANCES TO
RULING NO 16

REF:-SCADA

W.O:- NSND-013
(153)

U.O:- PCA 6692/A1



STANDARD

ANODIZING ON ALUMINIUM AND ALUMINIUM ALLOYS

SPEC.No . B 639

ISSUE No.6

12 OCT 2001

C
O
R
P
O
R
A
T
E
S
T
A
N
D
A
R
D
S
D
E
P
T
I
T
I
L
I
M
I
T
E
D
C
O
P
Y
R
I
G
H
T
R
E
S
E
R
V
E
D

1 SCOPE

This specification covers the process of anodizing on aluminium & aluminium rich alloy parts

1.1 Purpose

The anodizing of aluminium and aluminium rich alloys is primarily for protection against corrosion and to promote adhesion of organic protective coatings. It is not suitable for composite parts embodying other materials unless the latter are adequately "Stopped Off".

2 PROCESS

2.1 Degreasing

The parts shall be degreased as per specification B501G.

2.2 Cleaning

The parts shall be cleaned before treatment in the following sequence :

- Alkaline cleaning to specification B 501A Cl 2.2.
- Bright acid dipping as per specification B501A Cl 2.3.
- Emerying - using suitable grade emery.
- Alkaline cleaning to specification B 501A Cl 2.2.
- Bright acid cleaning as per specification B501A Cl 2.3.

2.3 Polishing

The parts shall be polished lightly as per specification B514C (less lacquering) if required to bring up lustre.

2.4 Cleaning

Immediately before anodic treatment, all parts shall be given a final washing in clean running water at room temperature.

2.5 Immersion of Parts for Treatment

The parts being treated shall be made the anode and, whenever practicable & shall be totally immersed in the electrolyte. Where total immersion is not practicable the portion to be treated subsequently shall overlap the portion treated previously.





STANDARD

ANODIZING ON ALUMINIUM AND ALUMINIUM ALLOYS

SPEC.No . B 639

ISSUE No.6

12 OCT 2001

2.5.1 Where multiple-treatment necessitates contact shall be made at treated surface & the film shall be removed at the points of contact if these points are to be retreated. If the points of contact remain outside the electrolyte the film shall be pierced by metallic spring clips with sharp points of sufficient size number to carry the required current.

2.5.2 Perforated receptacles can be used for the treatment of small parts. Parts with flat faces such as washers cannot be treated effectively in this manner unless mixed with other parts which prevent the major faces resting on each other. The receptacles shall be such as to allow free access of the electrolyte to all parts to prevent local overheating.

2.5.3 All leads from the anode rails to the part being treated, if in contact with the electrolyte shall be of aluminium, or suitable alloy or titanium and capable of carrying the necessary current without overheating.

Note : Atleast two leads shall be used from the anode rail to each part under treatment or to each receptacle containing small parts and the aluminium content of the leads shall not be less than that of the part being treated.

2.5.4. Care shall be taken that the parts under treatment do not come into contact with the tank, the stirrer, the heating and the cooling pipes or the plates, as this may cause break down of the film and damage.

2.5.5 Oxygen is evolved at the surface of the anode during the treatment. Where trapping of air or oxygen cannot be avoided multiple treatment shall be employed.

Note :

a) Electrolyte and operating conditions

The electrolyte shall consist of a solution of Sulphuric Acid to specification IS : 266 : 1993 with a concentration of 80 to 200 grams per litre. The current density shall be between 1.0 to 3 Amps / dm² at 10 to 25 volts, D.C. and the operating temperature shall be 20 to 25°C.

The water used shall be free from chloride for preparing the electrolyte. However, chloride in the electrolyte shall not exceed the equivalent of 0.2 gram per litre of Sodium Chloride. The dissolved aluminium shall not exceed 40 grams per litre for the Sulphuric Acid concentration given above.

The electrolyte shall be agitated by suitable mechanical means or by air, free from dust and oil to maintain a uniform temperature throughout. The electrolyte shall be kept clean and free from suspended matter by decantation.

DOCUMENTATION
CENTER

CONTROL BY 191F
SIG. *Deena Srinivasan*
DATE 13/6/24

PAGE 2/5

C
O
R
P
O
R
A
T
E

S
T
A
N
D
A
R
D
S

D
E
P
T

I
T
I

L
I
M
I
T
E
D

C
O
P
Y
R
I
G
H
T

R
E
S
E
R
V
E
D



STANDARD

ANODIZING ON ALUMINIUM AND ALUMINIUM ALLOYS

SPEC.No . B 639

ISSUE No.6

12 OCT 2001

C
O
R
P
O
R
A
T
E

S
T
A
N
D
A
R
D
S

D
E
P
T
M
E
N
T

L
I
M
I
T
E
D

C
O
P
Y
R
I
G
H
T

R
E
S
E
R
V
E
D

b) Cathode

The cathode shall consist of:

- i) The tank itself. When rivetted tanks are used, contact shall be effected at several points. Lead sheets as per specifications IS : 405 (Part 1) : 1992 may be used as tank lining. They shall be secured to the cathode rails in such a manner as to prevent their movement due to agitation of the electrolyte.

2.6 Rinsing and Drying

Immediately after the treatment, the parts shall be rinsed in clean running water at room temperature, followed by washing in hot water at 50 to 60° C (except parts treated as an aid to inspection) and dried in a dust-free atmosphere.

2.7 Dyeing

Dyeing shall normally be done by immersing the parts in the relevant dye immediately after rinsing but without allowing the parts to dry. Any suitable inorganic or proprietary organic dyes may be used for dyeing the anodic film. The dyed parts shall be dried using blow air.

2.8 Sealing

The anodized parts (undyed parts) shall be sealed by immersion in one of the following solution for periods and temperature indicated against each :

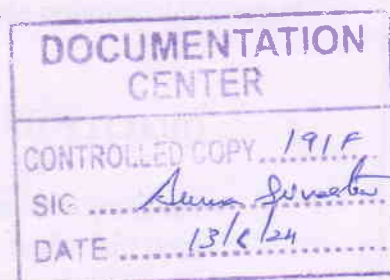
2.8.1 Demineralised water or distilled water

Temperature : 94 to 98°C
Duration : 20 to 60 minutes
pH : 6 to 6.5

2.8.2 Potassium dichromate or sodium dichromate 40 to 60 grams / litre in demineralised or distilled water (one litre)

Temperature : 94 to 98°C
Duration : 5 to 10 minutes
pH : 5.5 to 6.5

The pH value of the solution shall be maintained by the addition of boric acid or acetic acid.





STANDARD

ANODIZING ON ALUMINIUM AND ALUMINIUM ALLOYS

SPEC.No . B 639

ISSUE No.6

12 OCT 2001

2.9 Rinsing and Drying

After sealing, the parts shall be rinsed thoroughly in clean running water at room temperature (except in case of sealing by demineralised or distilled water) and then dried in a dust-free atmosphere.

2.10 Stripping of Anodic Coatings

Stripping solution shall be of any one of the following composition in distilled water :

- | | |
|--------------------------------|-------------|
| a) Phosphoric acid (S.G. 1.75) | 3.5 % V / V |
| Chromic acid (A.R.Quality) | 2.0 % W / V |

Note : This solution shall be used at boiling point.

- | | |
|--------------------|------------|
| b) Sulphuric acid | 10 % V / V |
| Potassium Fluoride | 4 % W / V |

Note : This solution shall be used at room temperature at aqueous condition.

- | | |
|--|------------|
| c) Sulphuric acid | 10 % V / V |
| Commercial hydrofluoric acid (50/60% HF) | 1% V / V |

Note : This solution shall be used at room temperature at aqueous condition.

3 QUALITY OF FINISH

The films obtained shall, immediately after rinsing and drying, but before any sealing, be such that when dyed with Methyl Violet Blue, or any other suitable dye with vigorous rubbing with a damp cloth shall not produce any appreciable loss of colour. The dye shall be applied either by using violet endorsing ink on a rubber pad or by a copying pencil rubbed over the moistened anodised surface.

DOCUMENTATION
CENTER

CONTROLLED COPY 191P
SIG
DATE 13/6/24



STANDARD

ANODIZING ON ALUMINIUM AND ALUMINIUM ALLOYS

SPEC.No . B 639

ISSUE No.6

12 OCT 2001

C
O
R
P
O
R
A
T
E

S
T
A
N
D
A
R
D
S

D
E
P
T

I
T
I

L
I
M
I
T
E
D

C
O
P
Y
R
I
G
H
T

R
E
S
E
R
V
E
D

4 Method for the Measurement of average thickness of anodic coatings

4.1 Test piece

The test piece shall, if possible, possess a total surface of not less than 32 sq. cm and shall be of such shape that the surface area of the coating is readily determinable.

4.2 Method

Weigh the clean and dry anodized test piece in gram to the nearest mg. and immerse in the stripping solution as given in clause 2.10 until constant weight is attained, which usually takes not more than 10 minutes. Wash the test-piece in hot, distilled water, dry and re- weigh.

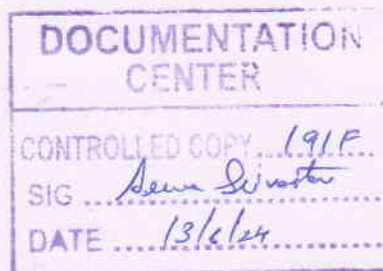
The loss of weight shall be taken as the weight of the anodic coating.

4.3 Calculation

The average thickness shall be given by : $T = \frac{W}{ad}$

where T = Thickness of coating in cm,
w = weight of coating in gram,
a = Surface area of the cathode coating in sq. cm,
d = Density of coating in g / ml. (taken as 2.5).

Note : This method is not suitable for coatings sealed with organic materials which cannot be removed without damage to the film. In such cases a separately prepared test piece shall be taken.



PREPARED	<i>[Signature]</i>	CEQ (NV)	Ref: B 639 ISS No:5	PAGE 5/5
CHECKED	<i>[Signature]</i>	CEQ (D)	Dated:15-12-1994+A1	
APPROVED	<i>[Signature]</i>	DGM (QV)	and Review.	