

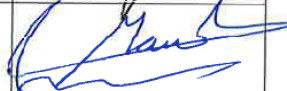


## Raw Material Specification

### Aluminum Extrusions & Forging of AA 7075 Alloy

Approved By: SHEQ Manager

#### Work Instructions

	Name	Job Title	Date	Signature/Stamp
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<b>Reviewed by:</b>	Kiran Kumar	Material Lab Engineer, SHEQ	05/03/2020	
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## 1 PURPOSE

- The purpose of this work instruction is to provide a detailed description Raw Material Specification of Aluminum Extrusion and Forgings AA 7075 Alloy

## 2 SCOPE

- This scope applies only to Material Specification Aluminum Extrusion and Forgings AA 7075 Alloy

## 3 CROSS REFERENCES

- N/A

## 4 ABBREVIATIONS & DEFINITIONS

ASTM:	American Society for Testing and Materials
EN:	European Standard
NDT	Non Destructive Test
MTC	Material Test Certificate

## 5 RESPONSIBILITIES

- The “Material Lab Engineer” is responsible to implement and maintain this work instructions document.

## 6 RESOURCES:

- NA

## 7 BREAKDOWN AND ITEMS LIST

- NA

## 8 WORK INSTRUCTIONS

	Specification	Reference Standard																																							
Material	Aluminum Extrusions and Forgings of AA7075 Alloy	EN 573-3																																							
Chemical Composition	<table border="1"> <thead> <tr> <th>Element</th><th>Symbol</th><th>Alloy EN-AW-7075</th></tr> </thead> <tbody> <tr> <td>Silicon</td><td>Si</td><td>0.4 Max</td></tr> <tr> <td>Iron</td><td>Fe</td><td>0.5 Max</td></tr> <tr> <td>Copper</td><td>Cu</td><td>1.2-2.0</td></tr> <tr> <td>Manganese</td><td>Mn</td><td>0.3 Max</td></tr> <tr> <td>Magnesium</td><td>Mg</td><td>2.1-2.9</td></tr> <tr> <td>Chromium</td><td>Cr</td><td>0.18-0.25*</td></tr> <tr> <td>Nickel</td><td>Ni</td><td>-</td></tr> <tr> <td>Zinc</td><td>Zn</td><td>5.1-6.1</td></tr> <tr> <td>Titanium</td><td>Ti</td><td>0.20 Max</td></tr> <tr> <td>Others Each</td><td>-</td><td>0.05</td></tr> <tr> <td>Other Total</td><td>-</td><td>0.15</td></tr> <tr> <td>Aluminium</td><td>Al</td><td>Balance</td></tr> </tbody> </table> <p>Note : 0.35 Max can be acceptable as per AMS -QQ-A-367</p>	Element	Symbol	Alloy EN-AW-7075	Silicon	Si	0.4 Max	Iron	Fe	0.5 Max	Copper	Cu	1.2-2.0	Manganese	Mn	0.3 Max	Magnesium	Mg	2.1-2.9	Chromium	Cr	0.18-0.25*	Nickel	Ni	-	Zinc	Zn	5.1-6.1	Titanium	Ti	0.20 Max	Others Each	-	0.05	Other Total	-	0.15	Aluminium	Al	Balance	AMS-QQ-A-367
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Shape and Size	Length and size as per the purchase order Dimensional Tolerance as per the Reference Standard Twist on Extrusions: 0.5 ° Maximum per meter Wall Thickness Variation: ± 5% Max Straightness : max 5mm Per Meter	ASTM A484/ A484M																																							
Heat treatment Condition	T6: Solution heat treated and then artificially aged (For Forging/ Extrusions) T6511: Solution heat treated, stress-relieved by stretching and artificially aged(For Extrusions) T61: Solution heat treated and then artificially aged.(For Forging)	ASTM B918 MIL-H-6088G MIL-A-22771D																																							
Delivery Condition	<ul style="list-style-type: none"> <li>Hardness: 135BHN /84 HRB Min</li> <li>Tensile Strength , Rm MPa 540 Min</li> <li>Yield Strength 0.2%, Rp MPa 460Min</li> <li>Elongation: 7% Min</li> </ul>	EN 755-2 ASTM E10 ASTM B557-10 EN586-2																																							
Surface Defect	Shall be Free from any Surface cracks, Dragging marks																																								
Inspection Report	<ul style="list-style-type: none"> <li>The supplier shall provide the raw material certificate that includes the information below:               <ul style="list-style-type: none"> <li>Material Specification.</li> <li>Dimensions of the Raw material.</li> <li>Heat Number</li> <li>Chemical Composition</li> <li>Heat treatment condition cycle parameters (time and temperature).</li> <li>Mechanical properties(Hardness , Tensile, Impact)</li> </ul> </li> </ul>	EN 10204:2001 Inspection certificate 3.1																																							

	<ul style="list-style-type: none"> <li>- X-Ray Inspection Report <ul style="list-style-type: none"> <li>▪ Certificate of Compliance with reference to our Purchase Order.</li> </ul> </li> </ul>	
NDT Inspection	<p>Extrusion and Forgings shall be free from Internal defects like Inclusion, Cracks, Blow holes, Lap, Micro Porosity, shrinkage etc</p> <p>X- Ray Inspection Forgings:</p> <p>Pre-Production Part Inspection for Forgings:</p> <ul style="list-style-type: none"> <li>• Continuous 10 good forgings components produced shall be tested for X-Ray, Inspection report for the whole Component and the images shall be submitted.</li> <li>• Any internal defect of size more than 0.5mm shall be rejected.</li> </ul> <p>Serial Production Part Inspection for Forgings</p> <ul style="list-style-type: none"> <li>• For every batch, 5% shall be tested for x-ray inspection and Inspection report for the whole Component and the images shall be submitted.</li> </ul> <p>X-Ray Inspection Extrusions: Applicable only for extrusions, which are specially made for Caracal components. Bought out items of standard extrusions like rods, pipes, slabs, plates are exempted from the inspection</p> <p>Pre-Production Part Inspection for Extrusions</p> <ul style="list-style-type: none"> <li>• Out of 10 extrusions, 2 extrusions with a minimum length of 3 meters shall be taken for testing; a length of 4 inches shall be X-Ray inspected. Inspection report and images shall be submitted.</li> </ul> <p>Serial Production Part Inspection for Extrusions</p> <ul style="list-style-type: none"> <li>• Out of 20 extrusions, 1 Extrusion with a minimum length of 3 meters shall be taken for testing; a length of 4 inches shall be X-Ray inspected. Inspection report and images shall be submitted.</li> <li>• Based on the pre-production part inspection, sampling plan for x-ray inspection shall be reviewed.</li> </ul>	ASTM E-155-00
Packing	<ul style="list-style-type: none"> <li>• Each bar or block shall be permanently labeled with the material grade and Heat number.</li> <li>• Bars shall be protected by oil and prepared for sea transportation.</li> </ul>	

**9 RELATED RECORDS & REPORTS**

FORM ID NUMBER	RECORD REPORT NAME
NA	NA

**10 DISTRIBUTION OF DOCUMENT**

No.	Receivers of document
1	Material Lab
2	HST
3	Procurement

**11 DOCUMENT REVISION HISTORY**

Revision	Page/ Paragraph	Changes description
00	-	Initial Issue