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|  | TEKNİK ŞARTNAME/ TECHNICAL SPECIFICATION | Döküman No Document No : TS.181 |
| | ALLOYING ELEMENT (Zirconium) | İlk Yayın Tarihi Publish Date : 21/10/2011 Rev. Tarihi Rev. Date : 27/09/2013 Rev. No: : 3 Sayfa/Page : 1 / 3 |

REVİZYON TARİHÇESİ/REVISION HISTORY

| Rev. No | Revizyon Tarihi Revision Date | Revizyon Açıklaması Revision Explanation | Değişen Sayfa Changed Page | Revize Eden Revised By |
|---------|----------------------------------|--|-------------------------------|---------------------------|
| 1 | 21/10/2011 | Responsibility part has been updated. | | |
| 2 | 15/10/2012 | Acceptance criteria for chemical properties has been changed | | |
| 3 | 27/09/2013 | Format has been changed. | | M.DÜNDAR |

1.0. KAPSAM/SCOPE

This specification identifies the required properties of Zirconium (Zr) master alloy added into the liquid aluminum in alloying practices of ASSAN aluminum.

2.0. MALZEME TANIMI VE ÖZELLİKLERİ/ PRODUCT DESCRIPTION AND SPECIFICATIONS

The materials to be delivered shall meet the qualities stipulated in this specification.

2.1. Chemical Composition

It must be in the form of master alloy with aluminum.

| | Min | Max |
|----|------|-------|
| Zr | 9,00 | 11.00 |
| Si | - | 0,300 |
| Fe | - | 0,400 |

2.2. Physical Properties


Shall be in waffle form.

No oxide deposits, swelling or any dirt (rust, mud etc.) should be present on the surface of waffles.

2.3. Dissolution in liquid metal

The recovery rate of Zr element in the metal bath must be above 95% for the application temperature of 700-800 °C at the end of 30 minutes.

| | HAZIRLAYAN/PREPARED BY | KALİTE SİSTEM ONAYI/ OMS APPROVAL | YÜRÜRLÜK ONAYI/ ENFORCEMENT APPROVAL |
|--------------------------------------|------------------------|--------------------------------------|---|
| ÜNVANI/TITLE | ÜPG DİREKTÖRÜ | KYS UZMANI | ÜPG DİREKTÖRÜ |
| ADI-SOYADI/ NAME-SURNAME | MURAT DÜNDAR | GÜLEN KİBAR | MURAT DÜNDAR |
| İMZA/SIGNATURE | | | |
| TEDARİKÇİ ONAYI/APPROVAL OF SUPPLIER | | | |
| TEDARİKÇİ ADI/ SUPPLIER NAME | | MÜHÜR / İMZA/ SIGNATURE | |
| YETKİLİ İSİM/ RESPONSIBLE | | | |
| TARİH/DATE | | | |

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3.0. TEST SERTİFİKASI VE / VEYA KOŞULLARI/ *TEST CERTIFICATE AND/OR CONDITIONS*

The supplier shall provide a test certificate for each material delivered showing the content of the master alloy that comply the specified values above. The following information must be included in the certificate:

Supplier's Name

Assan Order Number

Chemical composition

Product Name (and code, if available)

4.0. TESLİMAT ŞEKLİ/ *DELIVERY CONDITIONS*

4.1. Packaging

Shall be packed in maximum 1.5-ton pallets that are not affected by the environmental conditions (such as rain, moisture, mud and dust) and the packaging shall allow ease of handling by forklift. Each pack or piece should not exceed 15 kg.

| Height (mm) | Length (mm) | Width (mm) |
|----------------|----------------|---------------|
| 1200 | 1100 | 1150 |

4.2. Labeling

The following information should be shown on the label prepared for each skid:

Supplier's Name


Material Name

Net Weight

Shipping date

Production no

| | | | |
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| | HAZIRLAYAN/ <i>PREPARED BY</i> | KALİTE SİSTEM ONAYI/ <i>OMS APPROVAL</i> | YÜRÜRLÜK ONAYI/ <i>ENFORCEMENT APPROVAL</i> |
| ÜNVANI/ <i>TITLE</i> | ÜPG DİREKTÖRÜ | KYS UZMANI | ÜPG DİREKTÖRÜ |
| ADI-SOYADI/ <i>NAME-SURNAME</i> | MURAT DÜNDAR | GÜLEN KİBAR | MURAT DÜNDAR |
| İMZA/ <i>SIGNATURE</i> | | | |
| TEDARİKÇİ ONAYI/ <i>APPROVAL OF SUPPLIER</i> | | | |
| TEDARİKÇİ ADI/ <i>SUPPLIER NAME</i> | | MÜHÜR / İMZA/ <i>SIGNATURE</i> | |
| YETKİLİ İSİM/ <i>RESPONSIBLE</i> | | | |
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5.0. YÜKÜMLÜLÜK/ *OBLIGATION*

The supplier is obligated to meet the requirements indicated in this specification for each lot of materials delivered. The materials that do not meet with the requirements specified shall be returned. ASSAN may charge all the losses originating from the master alloy itself, that does not comply the specification, to the supplier, including all the processing cost so far incurred and any charges endorsed by the customer of ASSAN. In case of any discrepancy related to the quality issue violating the specification, the investigation reports issued by local research institute, TUBİTAK or universities İTÜ, ODTÜ, YTÜ will be employed for resolution.

6.0. SORUMLULUK/ *RESPONSIBILITIES*

The Product and Process Development Department is responsible from checking of certificate provided by the supplier for compliance with the specification. The Cast shop is responsible for checking physical properties and the proper use of the material in prescribed practices.

7.0. DİĞER HUSUSLAR/ *OTHER*

Supplier is obliged to have master alloy be tested in an accredited laboratory once in a year and submit the results to ASSAN.

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