

<b>AK TUBE – CORPORATE EXTERNAL (SUPPLIER) RAW MATERIAL SPEC REQUIREMENTS</b>	<b>PAGE 1 OF 9</b>	<b>REVISION DATE 8/23/19</b>	<b>NUMBER RM-005</b>
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## 1.0 PURPOSE

The purpose of this specification is to define the requirements for the purchase and/or processing of Raw Material for AK Tube LLC

## 2.0 SCOPE

This specification applies to the purchase and/or processing of Raw Material for AK Tube LLC

## 3.0 SLIT COIL REQUIREMENTS

- 3.1. Coils must be slit to the ordered width with a tolerance of  $\pm .010$ " max. Except 3.1a
  - 3.1 a Carbon Aluminized coils must be slit to the ordered width plus a Minimum of .020-.000"
- 3.2. Maximum burr of .005" allowed on edges.
- 3.3. No rolled edges, scratches or loose-wrapped coils.
- 3.4. Steel gauge check must be taken at a minimum frequency of three times per coil (head, middle, & tail), **OR** steel gauge check with gamma chart throughout coil. Gauge must fall within the specified gauge range.
  - 3.4.1. The high and low readings obtained must be recorded on the coil tag.
- 3.5. Coil Dimensions:
  - 3.5.1. ID of 20" min and 22" max
  - 3.5.2. OD of 72" maximum.
  - 3.5.3. Minimum of 500 PIW.
  - 3.5.4. Maximum 1000 PIW

## 4.0 MATERIAL DEFECTS FOR SLIT COIL

- 4.1. If defects are found in the material during processing, the following actions should be taken:
  - If the defect is a gauge or chemistry problem, slitting should be halted and the AK Tube Purchasing department notified before continuing to process the material. At that time, AK Tube will authorize either rejection or completion of processing.
  - If the defect is visual in nature, including but not limited to rust, stain, lamination, cross breaks, excessive oil (coated stainless), or severe edge wave, slitting should be halted and the AK Tube Purchasing Department must be notified before continuing to process the material. At that time, AK Tube will authorize either rejection or completion of processing.
  - If at any time customer supplied (conversion) material that is non-conforming or defective which has not been identified through AK Tube's standard procedures and is produced into tubing and the non-conformance has a negative impact on the quality of fit, form or function of the tube, AK Tube will not be responsible or held accountable for any non-conforming product that is directly related to the customer supplied raw material.

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## **5.0 MATERIAL QUALITY FOR SLIT COIL**

- 5.1. Material must be free of rust, pits, stains, flaking, lamination or other injurious defects.
- 5.2. Material must be free of coil breaks, stretcher strains, and fluting.
  - Unless otherwise stated in this specification or the AK Tube purchase order, all material must meet the quality chemical, mechanical, and dimensional tolerances per the latest applicable revision of the appropriate ASTM specification:
  - ASTM A568 steel, sheet, carbon, and high-strength, low-alloy, hot-rolled, and cold rolled.
  - ASTM A463 steel, sheet, aluminum-coated, by the hot-dip process.
  - ASTM A653 steel, sheet, zinc-coated (Galvanized) or zinc-iron alloy-coated (Galvannealed) by the hot-dip process.
- 5.3. Welded Coils
  - 5.3.1. Any coils Butt Welded to create a larger OD, must first be approved by AK Tube LLC.
  - 5.3.2. Must be a true weld. No Taping or other forms of attachment will be accepted.
  - 5.3.3. If approved, butt weld MUST be clearly marked on the side wall of the coil to show the location of the weld.
  - 5.3.4. A tag stating “WELDED COIL” must also be attached to the coil tag if this is a welded coil.
  - 5.3.5. Face of the strip must be spray painted on the top and bottom two (2) feet on each side of the weld, so that it is visible when it is paying off. Must use Yellow paint for marking of end welds.
  - 5.3.6. All joined coils MUST be arranged so that the Burr created by the slitting process is oriented the same for each coil. Burr presentation for the entire Master coil created by the welding process MUST be in the same direction.
- 5.4. Heavy Gage High Strength Coils
  - 5.4.1. High Strength material with a gauge above .130” AND strip width greater than 12” must be wrapped “Burr Up, with Bottom Presentation”.
    - Ex: As the coil is paying off from the bottom of the coil, the burr must be towards the ID of the coil.
- 5.5. All coils must be free of chemical treatments
  - 5.5.1. This applies to all purchased and or customer supplied coils

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## **6.0 BANDING AND TAGGING OF SLIT COIL**

6.1 All coils must be packaged with a minimum of:

- 6.1.1 Three (3) ¾” side bands spaced evenly around the coil in such a manner that they will not damage the slit edge, or allow the coil to telescope. These bands cannot be used to hold wood blocking or spacers. They are only to be used to secure the coil laps.
- 6.1.2 One (1) Bellyband around the circumference of the coil.
- 6.1.3 Material .050” gauge or lighter must have:
  - 6.1.3.1 Corrugated plastic donuts, protecting the sidewall of the coil, under the ¾” sidebands.
  - 6.1.3.2 Protectors around the banding seal to prevent the seal from damaging the material
  - 6.1.3.3 Corner protectors over the edge to prevent banding from damaging outer laps of coil.
- 6.1.4 No VCI coated OR wax paper is to be applied to the sidewall of the coils.
  - 6.1.4.1 If AK Tube requires **VCI treated paper** to prevent rust/condensation on the coil, it must be applied UNDER the ¾” sidewall banding. Treated side of the paper towards the sidewall of the coil.

6.2 Banding used must be steel. No tape or poly banding is permitted.

6.3 Do not mix heats on a lift of coils.

6.4 Each coil must be tagged with, at a minimum, the following information:

- Description of material
- Material width and gauge
- Actual material gauge readings
- Material heat number
- Purchase order number
- Master coil number
- Coil Weight

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## **7.0 LOADING OF SLIT COIL**

- 7.1. Maximum weight of an individual coil or coils combined to make a lift cannot exceed 18,000 lbs.
  - 7.1.1. Any wood spacers touching any coil at any point must be an actual dimension of 4” x 4”.
- 7.2. Stand Up Coils
  - 7.2.1. ONLY coils 12” and wider **may** be shipped standing up.
  - 7.2.2. If stand up coils are combined to ship as a lift”
    - 7.2.2.1. 4” spacers must be used to separate the coils. The 4x4s **MUST** be banded to one of the coils to prevent falling while being lifted.
    - 7.2.2.2. The total width of the coils placed together (Sidewall to Sidewall, including spacers) cannot exceed 63”
    - 7.2.2.3. The Outside diameter of coils bundled as a lift cannot vary by more than 2”. The center “eye” must be aligned to allow for level lifting with crane or forklift.
  - 7.2.3. The maximum weight for coils shipped standing up is **45,000 lbs (Walbridge)** and **30,000 lbs (Columbus)** per lift with a maximum individual coil weight of 18,000 lbs **(Walbridge)** or **10,000 lbs (Columbus)**. **Queretaro cannot accept standing coils at this time.**
- 7.3. Lay Down Coils –
  - 7.3.1. Coils less than 12” wide **must** be shipped lying down.
  - 7.3.2. Coils shipped lying down must be loaded for side unload and have a minimum of 4” clearance between bottom of coil and truck bed.
  - 7.3.3. No skids may be used. Loose 4 x 4 spacers must be used.
  - 7.3.4. Multiple coils may be stacked onto a lift with a minimum of 4” spacers between coils a maximum lift weight of 18,000 lbs. (Walbridge & Columbus)
  - 7.3.5. Multiple coils may be stacked onto a lift with a minimum of 4” spacers between coils a maximum lift weight of **7,000 lb or 3.5 tons** (Queretaro)
- 7.4. All wood spacers and blocks must be covered with a moisture barrier that will protect the coil edges from rust.
- 7.5. All 4 x 4 blocking must be at least 2 ½ feet apart to allow entry of forks.
- 7.6. Coils must be protected from damage during transit.
- 7.7. Tarps and chain protectors must be used.

## **8.0 WIDE BAND COIL CRITERIA**

- 8.1. ID=20” Minimum to 24” Maximum
- 8.2. OD=72” Maximum and 36” Minimum
- 8.3. Width=62” Maximum Width & 20” Minimum
- 8.4. A minimum of 500 PIW is required.
- 8.5. A maximum coil weight cannot exceed – 44,000 lbs.

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## **9.0 WIDE BAND COIL LOADING**

- 9.1. Coils must be loaded for crane unload.
- 9.2. Coils must be protected from damage in transit.
- 9.3. Tarps and chain protectors must be used.

## **10.0 WIDE BAND COIL PACKAGING**

- 10.1. All coils must be packaged to ensure safe transportation and handling in a manner that will not damage the coil.
- 10.2. Each coil must be tagged with, as a minimum, the following information:
  - Description of material
  - Material width and gauge
  - Material heat number
  - Purchase order number
  - Master coil number
  - Coil weight

## **11.0 MATERIAL QUALITY FOR WIDE BAND COIL**

- 11.1. Material must be free of rust, pits, stains, flaking, lamination or other injurious defects.
- 11.2. Material must be free of coil breaks, stretcher strains, and fluting.
  - Unless otherwise stated in this specification or the AK Tube purchase order, all material must meet the quality chemical, mechanicals, and dimensional tolerances per the latest applicable revision of the appropriate ASTM specification:
  - ASTM A568 steel, sheet, carbon, and high-strength, low-alloy, hot-rolled, and cold rolled.
  - ASTM A463 steel, sheet, aluminum-coated, by the hot-dip process.
  - ASTM A653 steel, sheet, zinc-coated (Galvanized) or zinc-iron alloy-coated (Galvannealed) by the hot-dip process.
- 11.3. All coils must be free of chemical treatments
  - 11.3.1 This applies to all purchased and or customer supplied coils

## **12.0 SHIPPING DOCUMENTS**

- 12.1. The following documents must accompany all shipments:
  - A packaging slip that contains the AK TUBE purchase order number
  - Description of the material (type, gauge and width)
  - List of each coil or lift with the corresponding weight and heat number of each.
  - The number of coils in each lift must be noted.
  - The raw material heat number for each coil, chemistry and mechanicals (if required), and country of origin. This information must be included on the Bill of Lading or Material Certification.
  - If the material was processed with a deviation from AK Tube, the waiver form must accompany the shipment.

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### **13.0 DEVIATIONS FOR WIDE BAND MATERIAL**

- 13.1. Any deviation to these specifications must be communicated to the AK Tube purchasing department. If approved by AK Tube, a signed completed waiver form will be forwarded to your facility. This form must accompany all shipments of material covered by the deviation. AK owned coils do not require a waiver form.
- 13.2. Any authorization to ship nonconforming material must be communicated with a customer waiver form (8.3.4-SA-05-F) completed by AK Tube. A copy of this form must accompany the material when shipped to AK Tube. AK owned coils do not require a waiver form.

### **14.0 ON TIME DELIVERY REQUIREMENTS SLIT AND WIDE BAND**

- 14.1. AK Tube requires 100% on time delivery.
- 14.2. Criteria for On-time delivery are as follows:
  - 14.2.1. Order quantity +/- 10%
  - 14.2.2. Delivery Received two (2) working days prior to due date through due date of purchase order.
- 14.3. With approval of AK Tube, this requirement may be waived through the deviation process.
- 14.4. On time delivery performance will be monitored on a monthly basis and reported to the supplier monthly upon request.

### **15.0 QUALITY PERFORMANCE**

- 15.1. Quality performance for nonconforming raw material will be monitored on a monthly basis and reported to the supplier monthly upon request.
- 15.2. Cumulative quality performance goals are .5% rejection rate maximum for a calendar year.
- 15.3. Rejection rates in excess of 2% in any month may result in a request for written corrective action depending upon the severity and impact.
- 15.4. Any rejection may result in a request for written corrective action based upon the severity and impact.

### **16.0 MATERIAL CERTIFICATION**

- 16.1. All material certifications must be traceable to the producing mill and certified by an A2LA certified laboratory.
- 16.2. If not originally provided with shipment, upon request by AK Tube, the producing mill or A2LA laboratory certification must be provided within 48 hours of such request.

### **17.0 FAILURE TO COMPLY**

- 17.1. Failure to comply with any of these specifications may result in a rejection and claim or refusal to unload material. Non-compliance with this specification, depending upon the severity, may result in a request for written corrective action. Material that is refused at AK Tube receiving for noncompliance will be returned to the supplier facility.

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**18.0 REFERENCES:**

CONTRACT REVIEW	7.2.2-SA-01-I
CHANGE MANAGEMENT PROCESS	7.1.4-QA-01-I
SUPPLIER EVALUATION AND DEVELOPMENT	7.4.3-PC-02-I
CONTROL OF CUSTOMER SUPPLIED PRODUCT	7.5.4-SA-01-I
Customer Waiver Form	8.3.4-SA-05

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REV #	REVISION DATE	REVISION SUMMARY	AFFECTED PAGES
0	1/15/10	New Raw Material Spec created out of the consolidation of RM-001, 002, 003 and RM-004 per Tom Greco; added corrugated plastic donuts – CA#1195	All
1	1/18/10	Added 8.1 & 8.2 ID/OD Min/Max	3
2	2/5/10	7.2.2.2 change 40” to 62” – width of coils side by side cannot exceed per Tom Greco	3
3	3/2/10	Added: No VCI coated OR wax paper is to be applied to the sidewall of the coils. If AK Tube requires <b>VCI treated paper</b> to prevent rust/condensation on the coil, it must be applied UNDER the 3/4” sidewall banding. Treated side of the paper towards the sidewall of the coil. Per Tom Greco	3
4	3/16/10	Added “Walbridge Only” to the heading to ensure this does not cause confusion for Columbus customers: per John Osadchuk	All
5	4/16/10	Under Section 10.2 – removed “ <i>Actual material gauge readings</i> ” per Ken Howe	5
6	10/5/10	Added section 5.4 – This is to identify proper way to wrap the heavy gauge coils.	3
7	1-19-11	Per Ken H. Section 12.1 Bullet point #5, Change “This information may be included on the packing slip or on a separate certification.” To “This information must be included on the Bill of Lading or Material Certification.” Removed Production Manager from approval section as he is also the Manufacturing Manager.	5,8
8	3/28/12	Added section 5.3.6 regarding coil burr	2
9	5/16/12	Added section to exclude chemical treated coils from being sent to AK Tube for both slit and wide band coils Added references to work instructions including RM-005	2 5 8
10	6/13/13	4.1: added – “If at any time customer supplied (conversion) material that is non-conforming or defective which has not been identified through AK Tube’s standard procedures and is produced into tubing and the non-conformance has a negative impact on the quality of fit, form or function of the tube, AK Tube will not be responsible or held accountable for any non-conforming product that is directly related to the customer supplied raw material.	1
11	8/26/13	4.1 added: “excessive oil (coated stainless)”; 11.2 and 12.1 changed “physicals” to “mechanicals”.	1, 5, 6
12	12/7/15	3.1 a added: “Carbon Aluminized coils must be slit to the ordered width plus a Minimum of .020-.000” 7.2.2.2 changed 62” to 65”- width of coils side by side	1 4
13	8/11/16	Clarified sections 14.0 & 15.0	6 & 7
14	4/11/17	Removed obsolete Deviation form & reference (step 4.2)	2
15	3/22/19	Replaced deviation form in 13.2 with customer waiver form (added to references) & added clause regarding AK owned coils	6 & 7
16	7/11/19	Updated total width of coils placed together – reduced from 65” to 63”; added bullet 7.3.5 with QRO requirements; specified bullet 7.3.4 as Wal & Col; updated approval block & Header – now Corporate document	4,8,9
17	8/23/19	Clarified 18.1.1 and 18.1.2 Maximum lift weights for 3 plants.	4

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### APPROVALS

Signature	Title	Date
	Operations Manager - Walbridge	
	Operations Manager - Columbus	
	Operations Manager - Queretaro	
	VP Purchasing/Procurement	