

## ***NORTH STAR BLUESCOPE STEEL LLC* Material Specification**

Process Area: LMF	Number: AL 17.17
Material: Standard (High Carbon) Ferromanganese - (FeMn) Grade B	Effective Date: 01/16/18
Authorized By: Jim Fox	Review Date: 01/16/19

### **1.0 Application:**

Ladle addition for alloying purposes.

### **2.0 Chemical Analysis and Material Properties:**

<b>Element</b>	<b>Absolute min.</b>	<b>Preferred min.</b>	<b>Preferred max.</b>	<b>Absolute max.</b>
Manganese	75.0%			82%
Carbon				7.5%
Silicon				1.2%
Phosphorous				0.35%
Sulfur				0.05%
Arsenic				0.30%
Tin				0.02%
Lead				0.05%
Chromium				0.50%

### **3.0 Packaging:**

- 3.1 Bulk Dump Truck, trucks must be tarped and material dry - each shipment to be identified with lot number.
- 3.2 50lb. bags - 4000lb. per pallet (when ordered this way)
- 3.3 The North Star BlueScope Steel Raw Material Number must appear on all shipping and billing paperwork.

### **4.0 Sizing:**

- 4.1 2 in. By ½ in. with 10% max retained on 3” screen (not to be larger than 4”) and less than 10% passing ½” screen. (Review sizing verbage at time of contract bids)
- 4.2 **Glencore** to supply 3 ½ in. by ¼ in with 10% max. retained on 4” screen(not larger than 4.5”) and less than 10% passing ¼ ” screen
- 4.3 **Minerais** to supply 2 x ¼ in with 10% max. retained on 3” screen (not to be larger than 4”) and less than 10% passing ¼ ”
- 4.4 **Considar** to supply 2 ½ in by ½ in with 10% max retained on 3” screen (not to be larger than 4”) and less than 10% passing ½” screen.
- 4.5 2 in. By ½ in. for 50lb. bags

### **5.0 Certification and Control:**

- 5.1 Each lot received to include statements of conformity and certification. These documents must be handed in at the scales and include:
  - Certification for Manganese, Carbon, Silicon, Phosphorous, and Sulfur.
  - Quantity
  - Name of material
  - Lot number
- 5.1 All chemical constituents not expressed but are contained in the subject material may not exceed 0.5% (except for Al) collectively. Any material lot exceeding 0.5% must have prior approval by purchasing before shipment is made and analysis included on certification.
- 5.2 Material is subject to inspection at North Star BlueScope Steel to test adherence to specification.
- 5.3 All material supplied to this specification must be equivalent in all respects to the material on which approval was originally granted.

### **6.1 Relevant Industry Standards (e.g. ASTM):**

Prepared by: Kevin Jessing	Page 1 of 2
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ASTM A99 Grade B

### **7.0 Hazardous Material:**

If this material is hazardous or requires special handling or storage, this information must be clearly labeled on containers and shipping documents. MSDS Sheets must also be sent to purchasing manager for new materials.

### **8.0 Attachments/Reference Documents:**

N/A

<b>Rev</b>	<b>Date</b>	<b>Description of change</b>	<b>Reason for change:</b>
	12/07/11	Reviewed and reauthorized	Annual review
	12/14/12	Reviewed and reauthorized	Annual review
	12/17/13	Reviewed and reauthorized	Annual review
	11/20/14	Reviewed and reauthorized	Annual review
	10/22/15	Reviewed and reauthorized	Annual review
	01/04/17	Reviewed and reauthorized	Annual review
	01/16/18	Reviewed and reauthorized	Annual review