

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

Process Area: LMF	Number: AL 41.09
Material: Ferrocolumbium (FeCb) (Ferro Niobium)	Effective Date: 05/12/25
Authorized By: Tony Spadafore	Review Date: 05/12/26

1.0 Application:

Ladle addition for alloying purposes.

2.0 Chemical Analysis and Material Properties:

Element	Absolute min.	Preferred min.	Preferred max.	Absolute max.
Columbium	60.0%			70.0%
Tantalum				2.0%
Carbon				0.3%
Manganese				2.0%
Silicon				3.5%
Aluminum				2.0%
Tin				0.15%
Phosphorous				0.15%
Sulfur				0.08%

3.0 Packaging:

- 3.1 10 lb. contained Cb in cans - or bags when cans not available - (all sizing / forms for manual additions), in wooden crates or banded to winged pallets that have horizontal slats extending beyond the vertical 2x4 main members (wings) to facilitate lifting via pallet chain / bar lifting rig. Packages must be stenciled with the North Star BlueScope Raw Materials Number (AL41), contained Cb weight (lbs) per package, and material name (abbreviated) when ordered this way.
- 3.2 3000 – 4400 lb bulk weight supersacks (all sizing and forms approved for bulk addition use). Must be polymesh sacks with lifting loops at top 4 corners, no bottom spout (flat bottom) and no inner liner. Packages must be stenciled with North Star BlueScope Raw Materials Number (AL41), bulk weight (lbs) per package, and material name (abbreviated) when ordered this way. Super sacks must sit on pallets. The super sacks must sit inside the outer edge of all 4 sides of the pallet. NSBSL will not accept any pallets with over hanging super sacks
- 3.3 Pallets must be made of high quality lumber. Slat spacing must not allow for super sacks to fall between the slats. NSBSL will not accept pallets with broken slats.
- 3.4 The North Star BlueScope Steel Raw Material Number must appear on all shipping and billing paperwork.
- 3.5 Flatbed shipping only

4.0 Sizing:

- 4.1 2 inch x down – approved for manual or bulk addition

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 lbs Columbium contained per bag, Tantalum, Silicon and Aluminum.
 - Quantity
 - Name of material
 - Lot number
 - North Star BlueScope Steel Material Number
- 5.1 All chemical constituents not expressed but are contained in the subject material may not exceed 0.5% 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.

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6.0 Relevant Industry Standards (e.g. ASTM):

ASTM A 550

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

Rev.	Date	Description of change	Reason for change:
	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
08	01/19/16	Changed structure to make uniform with other specs and modify packaging to for use in new micro alloy system	Accommodate use in new alloy system
	01/04/17	Reviewed and reauthorized	Annual review
	01/16/18	Reviewed and reauthorized	Annual review
09	02/23/18	Updated Packaging section	Current procedure
	01/28/19	Reviewed and reauthorized	Annual review
	03/09/20	Reviewed and reauthorized	Annual review
	04/23/21	Reviewed and reauthorized	Annual review
	04/12/22	Reviewed and reauthorized	Annual review
	03/07/23	Reviewed and reauthorized	Annual review
	04/11/24	Reviewed and reauthorized	Annual review
	05/12/25	Reviewed and reauthorized	Annual review

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