

**Sheet, High Carbon Spring Steel**

EMPIS Material B4E6 identifies high-carbon spring steel sheet similar to UNS G10950 as follows:

<u>EMPIS designation</u>	<u>Description</u>
B4E6A	Hot rolled and annealed
B4E6B	Hot rolled, annealed, heat treated to requirements
B4E6C2	Hot rolled, unannealed, roll flattened
B4E6C3	Hot rolled, unannealed, roll flattened, special edge control

CHEMICAL COMPOSITION: % (Heat analysis)

Carbon	0.85–1.05
Manganese	0.25–0.50
Phosphorus, max	0.035
Sulfur, max	0.035

The heat (formerly ladle) analysis made by the manufacturer to determine the percentages of the elements required under this specification shall be reported to the purchaser or his representative in a certificate of test when specified on purchase order or otherwise.

A product (formerly check) analysis may be made by the purchaser from a sample representing each lot. The chemical composition thus determined shall conform to the requirements of this specification within the ISS (formerly AISI) standard permissible variations for product analysis.

ADDITIONAL REQUIREMENTS:

Process – Material shall be made by the basic oxygen or electric furnace process unless otherwise specified.

Imperfections – This material shall be free from injurious external and internal imperfections of a nature which will interfere with the purpose for which it is intended.

Condition – EMPIS Material B4E6A shall be in a suitable condition for fabrication and hardening into finished springs by the purchaser.

Anneal – EMPIS Material B4E6A shall be furnace annealed at 1,450 °F minimum temperature.

Heat treatment – EMPIS Material B4E6B shall be B4E6A material which has been heat treated to meet the required properties and tempers otherwise indicated (drawing, etc.).

Finish – EMPIS Materials B4E6C2 and C3 shall have a tightly adherent oxide scale.

Roll flattening – EMPIS Materials B4E6C2 and C3 shall be roll flattened after shearing to specified size.

Edges – EMPIS Material B4E6C3 shall be supplied with edges which are visually free of imperfections and defects, including: burrs, cracks, fissures, irregularities or breaks. Edge may require refinishing to produce a condition similar to a number 4, rounded or a number 6, square edge condition. It is expected the product can be finish processed and utilized without producing edge defects.

REFEREE METHODS:

Chemical composition ASTM A751

TOLERANCES:

Thickness: (1)

Specified width, inch		Specified thickness, inch									
		0.2299–0.1800	0.1799–0.0972	0.0971–0.0822	0.0821–0.0710	0.0709–0.0568	0.0567–0.0509	0.0508–0.0389	0.0388–0.0314	0.0313–0.0195	Up to 0.0194
Over	To incl	Tolerance, inch, plus or minus									
12	15	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.002
15	20	0.008	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.003	0.002
20	32	0.009	0.008	0.007	0.007	0.006	0.006	0.005	0.004	0.003	0.002
32	40	0.009	0.009	0.008	0.007	0.006	0.006	0.005	0.004	0.003	0.002
40	48	0.010	0.010	0.008	0.007	0.006	0.006	0.005	0.004	0.003	0.002
48	60	–	0.010	0.008	0.007	0.007	0.006	0.005	0.004	–	–
60	72	–	0.011	0.009	0.008	0.007	0.007	0.006	0.005	–	–
72	80	–	0.012	0.009	0.008	–	–	–	–	–	–
80	–	–	0.012	0.010	–	–	–	–	–	–	–

(1) Measured at any point on the sheet not less than 3/8 inch from an edge.

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Sheet, High Carbon Spring Steel

TOLERANCES: (Continued)

Width:

Width, inch		Tolerance, inch, plus only (2)
Over	To incl	
12	30	1/8
30	48	3/16
48	60	1/4
60	80	5/16
80	—	3/8

(2) No tolerance under.

Length:

Length, inch		Tolerance, inch, plus only (3)
Over	To incl	
—	15	1/8
15	30	1/4
30	60	1/2
60	120	3/4
120	156	1
156	192	1 1/4
192	240	1 1/2
240	—	1 3/4

(3) No tolerance under.

CERTIFICATE OF TEST:

When requested, the supplier shall submit promptly to the purchaser at the point of delivery a certificate of test showing the results of tests for chemical analysis required by this specification. This certificate shall be addressed to the section, unit, or person specified on the purchase order, and shall contain the EMPIS designation, and the purchase order number, so that the certificate may be identified with the shipment.

PACKING AND MARKING:

All material shall be separated by size for shipment, and carefully packed to avoid damage or loss during shipment. When lift size is not specified on the purchase order, standard lift will be acceptable.

Each shipment shall be legibly marked with the purchase order number, the weight, the manufacturer's name, and the EMPIS designation.