Designation: A 463/A 463M – 06

Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process[1]

This standard is issued under the fixed designation A 463/A 463M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers aluminum-coated steel sheet in coils and cut lengths available with two types of aluminum coating applied by the hot-dip process, with several coating weights [masses].

1.2 Product furnished under this specification shall conform to the applicable requirements of the latest issue of Specification A 924/A 924M, unless otherwise provided herein.

1.3 This specification is applicable to orders in either inch-pound units (as A 463) or SI units [as A 463M]. Values in inch-pound and SI units are not necessarily equivalent. Within the text, SI units are shown in brackets. Each system shall be used independently of the other.

1.4 Unless the order specifies the "M" designation (SI units), the product shall be furnished to inch-pound units.

1.5 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 428/A 428M Test Method for Weight [Mass] of Coating on Aluminum-Coated Iron or Steel Articles

A 480/A 480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

A 902 Terminology Relating to Metallic Coated Steel Products

A 924/A 924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

E 517 Test Method for Plastic Strain Ratio *r* for Sheet Metal

E 646 Test Method for Tensile Strain-Hardening Exponents (n -Values) of Metallic Sheet Materials

3. Terminology

3.1 *Definitions*—See Terminology A 902 for definitions of general terminology relating to metallic-coated steel products.

4. Classification

4.1 The steel sheet is available in several designations, as follows:

4.1.1 Commercial Steel (CS Types A, B, and C),

4.1.2 Forming Steel (FS),

4.1.3 Deep Drawing Steel (DDS),

4.1.4 Extra Deep Drawing Steel (EDDS),

4.1.5 Structural Steel (SS),

4.1.6 High Strength-Low Alloy Steel (HSLAS Type A),

4.1.7 High Strength-Low Alloy Steel (HSLAS Type B),

4.1.8 Ferritic Stainless Steel (FSS Type 409), and

4.1.9 Ferritic Stainless Steel (FSS Type 439).

4.2 Structural Steel (SS) and High Strength-Low Alloy Steels (HSLAS Types A and B) are available in several grades and classes.

4.3 The aluminum coating is available in two types with several coating weights [masses] with coating designations as shown in Table 1.

4.3.1 *Coating Type 1* is manufactured using a coating bath of aluminum–silicon alloy containing 5 to 11 % silicon to promote better adherence. It is intended principally for heat-resisting applications and also for uses where corrosion resistance and heat are involved. It is available as a coating on each of the designations of steel sheet listed in 4.1.

[1] This specification is under the jurisdiction of ASTM Committee A05 on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.11 on Sheet Specifications.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard.**

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TABLE 1 Weight [Mass] of Coating Requirements[A,B]

NOTE 1—Tables X2.1 and X2.2 provide an estimate of coating thickness based on coating weight [mass].

Coating Designation	Minimum Requirement	
	Triple-Spot Test, Total Both Sides	Single-Spot Test, Total Both Sides
	Inch-Pound Units	
	oz/ft^2	oz/ft^2
T1–13	0.13	0.10
T1–25	0.25	0.20
T1–40	0.40	0.30
T1–100	1.00	0.90
T2–LC	no minimum	no minimum
T2–65	0.65	0.60
T2–100	1.00	0.90
	SI Units	
	g/m^2	g/m^2
T1M 40	40	30
T1M 75	75	60
T1M 120	120	90
T1M 300	300	270
T2M LC	no minimum	no minimum
T2M 200	200	180
T2M 300	300	270

[A] The coating designation number is the term by which this product is specified. Because of the many variables and changing conditions that are characteristic of continuous hot-dip coating lines, the weight [mass] of coating is not always evenly divided between the two surfaces of a sheet, nor is the coating evenly distributed from edge to edge. However, normally not less than 40 % of the single-spot test limit will be found on either surface.

[B] No minimum means that there are no established minimum requirements for triple- and single-spot tests, but aluminum coating shall be present.

4.3.2 *Coating Type 2* is a commercially pure aluminum. It is intended principally for use in applications requiring corrosion resistance and is available only as a coating on Commercial Steel, Forming Steel, Structural Steel, and High Strength-Low Alloy Steel.

5. Ordering Information

5.1 Product under this specification shall be ordered to decimal thickness only, and dimensional tolerances of Specification A 924/A 924M shall apply. Specification A 480/A 480M shall apply to FSS (Types 409 and 439) for thickness tolerances only. The following, as required, shall be used to adequately describe the product required.

5.1.1 Name of product (steel sheet, aluminum-coated Type 1 or 2),

5.1.2 Designation of sheet (CS (Types A, B, and C), FS, DDS, EDDS, SS, HSLAS (Type A or B); and FSS (Types 409 and 439)).

5.1.2.1 When a CS type is not specified, Type B will be furnished.

5.1.2.2 When a SS or HSLAS designation is specified, state the type, grade, or class, or combination thereof.

5.1.3 ASTM designation number and year of issue,

5.1.4 Coating designation,

5.1.5 Specify whether oiled or dry or chemically treated, oiled or dry,

5.1.6 Dimensions (show thickness, minimum or nominal; width; and length, if cut lengths). The purchaser shall specify the appropriate table of thickness tolerances in Specification A 924/A 924M that applies to the order, that is, the table of thickness tolerances for ⅜-in. [10-mm] edge distance, or the table of thickness tolerances for 1-in. [25-mm] edge distance. A 480/A 480M shall apply to FSS (Types 409 an 439) for thickness tolerances only.

5.1.7 Coil size requirements (specify maximum outside diameter (OD), acceptable inside diameter (ID), and maximum coil weight),

5.1.8 Application (show part identification and description),

5.1.9 Certification, if required, and heat analysis and mechanical property report, and

5.1.10 Special requirements (if required).

NOTE 1—Typical ordering descriptions are as follows: Steel sheet, aluminum-coated, Forming Steel (FS), ASTM A 463 – __, Coating Designation T1 40, chemically treated dry, minimum 0.040 in. by 34 in. by coil, 48-in. maximum outside diameter, 20-in. inside diameter, 20 000-lb maximum coil weight, for muffler ends.

Steel Sheet, aluminum-coated, Commercial Steel (CS Type A), ASTM A 463M – __, Coating Designation T1M 120, chemically treated dry, minimum 1.00 mm by 920 mm by coil, 1200-mm maximum outside diameter, 500-mm inside diameter, 10 000-kg maximum coil weight, for range heat shield.

NOTE 2—The purchaser should be aware that there are variations in manufacturing practices among the producers and therefore is advised to establish the producer's standard (or default) procedures for thickness tolerances.

6. Chemical Composition

6.1 *Base Metal*:

6.1.1 The heat analysis of the base metal shall conform to the requirements shown in Table 2 for CS (Types A, B, and C), FS, DDS, EDDS, and FSS (Types 409 and 439), Table 3 for SS and HSLAS.

6.1.2 When the amount of copper, nickel, chromium, or molybdenum is less than 0.02 %, report the analysis either as <0.02 % or the actual determined value. When the amount of vanadium, titanium, or columbium is less than 0.008 %, report the analysis as either <0.008 % or the actual determined value. When the amount of boron is less than 0.0005 %, report as <0.0005 % or the actual determined value.

6.1.3 See Specification A 924/A 924M for chemical analysis procedures and product analysis tolerances.

6.1.4 The heat analysis of the base metal for FSS (Types 409 and 439) shall conform to the requirements shown in Table 2.

6.1.5 See Specification A 480/A 480M for chemical analysis procedures and product analysis tolerances for FSS (Types 409 and 439).

6.2 *Coating Bath Composition*:

6.2.1 The bath metal used for Type 1 shall contain an aluminum-silicon alloy containing 5 to 11 % silicon, the balance aluminum.

6.2.2 The bath metal used for Type 2 shall contain commercially pure aluminum.

7. Mechanical Properties

7.1 Structural steel and high strength low alloy steel shall conform to the mechanical property requirements of Table 4 for the type, grade, or class, or combination thereof, specified.

7.2 The typical mechanical properties for CS (Types A, B, and C), FS, DDS, EDDS and FSS (Types 409 and 439), steel

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TABLE 2 Chemical Requirements

Designation	Composition, %—Heat Analysis Element, max (unless otherwise shown)												
	C	Mn	P	S	Al[A]	Cu[B]	Ni[B]	Cr[B]	Mo[B]	V	Cb[C]	Ti	B
CS Type A[D,E,F]	0.10	0.60	0.030	0.035	. . .	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
CS Type B[D,F]	0.02 to 0.15	0.60	0.030	0.035	. . .	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
CS Type C[D,F]	0.08	0.60	0.10	0.035	. . .	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
FS[F]	0.02 to 0.10	0.50	0.020	0.030	. . .	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
DDS[G,H]	0.06	0.50	0.020	0.025	0.01, min	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
EDDS[I,H]	0.02	0.40	0.020	0.020	0.01, min	0.20	0.20	0.15	0.06	0.008	0.008	0.30	. . .
FSS Type 409[J]	0.030	1.00	0.040	0.020	. . .	0.50	0.50	10.5 to 11.7	0.60	...	...	[J]	. . .
FSS Type 439[K]	0.07	1.00	0.040	0.030	0.15	0.50	0.50	17.0 to 19.0	0.06	...	...	[K]	. . .

[A]Where an ellipsis (. . .) appears in the table, there is no requirement, but the analysis result shall be reported.
[B]The sum of copper, nickel, chromium, and molybdenum shall not exceed 0.50 % on heat analysis. When one or more of these elements are specified, the sum does not apply; in which case, only the individual limits on the remaining elements shall apply. This requirement does not apply to Types 409 and 439.
[C]For steels having a carbon content of 0.02 % or less, the limit for columbium is 0.045 % maximum.
[D]For CS, specify Type B to avoid carbon levels below 0.02 %.
[E]CS Type B describes the typical commercial quality product previously included in this specification.
[F]When a deoxidized steel is required for the application, the purchaser has to option to order CS to a minimum of 0.01 % total aluminum.
[G]Furnished either as stabilized or not-stabilized steel at the producer's option.
[H] DDS and EDDS are available only as Coating Type 1 steel sheet.
[I]Shall be furnished as a stabilized steel.
[J]Shall contain silicon 1.00 % maximum, nitrogen 0.030 % maximum, and titanium [6 × (carbon + nitrogen)] minimum to 0.50 % maximum.
[K]Shall contain silicon 1.00 % maximum, nitrogen 0.04 % maximum, titanium + columbium [0.20 + 4 × (carbon + nitrogen)] minimum to 1.10 % maximum.

TABLE 3 Chemical Requirements[A]

Designation	Composition, %—Heat Analysis Element, max (unless otherwise shown)										
	C	Mn	P	S	Cu[B]	Ni[B]	Cr[B]	Mo[B]	V[C]	Cb[C,D]	Ti
SS											
Grade 33 [230]	0.20	. . .	0.40	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 37 [255]	0.20	. . .	0.10	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 40 [275]	0.25	. . .	0.10	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 50 [340](Classes 1 and 2)	0.25	. . .	0.20	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 50 [340](Class 3)	0.25	. . .	0.04	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 80 [550]	0.20	. . .	0.04	0.04	0.20	0.20	0.15	0.06	0.008	0.008	0.30
HSLAS Type A[E]											
Grade 50 [340]	0.20	1.20	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 60 [410]	0.20	1.35	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 70 [480]	0.20	1.65	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 80 [550]	0.20	1.65	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
HSLAS Type B[E,F]											
Grade 50 [340]	0.15	1.20	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 60 [410]	0.15	1.20	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 70 [480]	0.15	1.65	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30
Grade 80 [550]	0.15	1.65	. . .	0.035	0.20	0.20	0.15	0.06	0.008	0.008	0.30

[A]Where an ellipsis (. . .) appears in the table, there is no requirement, but the analysis result shall be reported.
[B]The sum of copper, nickel, chromium and molybdenum shall not exceed 0.50 % on heat analysis. When one or more of these elements are specified the sum does not apply; in which case, only the individual limits on the remaining elements shall apply.
[C]The limits do not apply when HSLAS is specified.
[D]For steels having a carbon content of 0.02 % or less, the limit for columbium is 0.045 % max.
[E]Steel conforming to this designation commonly contains the strengthening elements columbium, nitrogen, phosphorus, or vanadium added singly or in combination.
[F]The producer has the option to treat these steels by means of small alloy additions to effect sulfide inclusion control.

sheet designations are listed in Table 5. These mechanical property values are nonmandatory. They are solely to provide the purchaser with as much information as possible to make an informed decision on the steel to be specified. Values outside these ranges are to be expected.

7.3 When base metal mechanical properties are required, all tests shall be conducted in accordance with the methods specified in Specification A 924/A 924M.

7.4 *Bending Properties*:

7.4.1 *Minimum Cold Bending Radii*—Structural steel sheet is commonly fabricated by cold bending. There are many interrelated factors that affect the ability of a steel to cold form over a given radius under shop conditions. These factors include: thickness, strength level, degree of restraint, relationship to rolling direction, chemistry, and base metal microstructure. Appendix X1 lists the suggested minimum inside radius for 90° cold bending for these steel sheets. They presuppose "hard way" bending (bend axis parallel to rolling direction) and

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TABLE 4 Mechanical Requirements, Base Metal (Longitudinal)

Inch-Pound Units

Designation	Grade	Yield Strength, min, ksi	Tensile Strength, min, ksi[A]	Elongation in 2 in., min, %[A]
SS	33	33	45	20
	37	37	52	18
	40	40	55	16
	50 (Class 1)	50	65	12
	50 (Class 2)	50	. . .	12
	50 (Class 3)	50	70	12
	80[B]	80[C]	82	. . .
HSLAS Type A	50	50	60[D]	20
	60	60	70[D]	16
	70	70	80[D]	12
	80	80	90[D]	10
HSLAS Type B	50	50	60[D]	22
	60	60	70[D]	18
	70	70	80[D]	14
	80	80	90[D]	12

SI Units

Designation	Grade	Yield Strength, min, MPa	Tensile Strength, min, MPa[A]	Elongation in 50 mm, min, %[A]
SS	230	230	310	20
	255	255	360	18
	275	275	380	16
	340 (Class 1)	340	450	12
	340 (Class 2)	340	. . .	12
	340 (Class 3)	340	480	12
	550[B]	550[C]	570	. . .
HSLAS Type A	340	340	410[D]	20
	410	410	480[D]	16
	480	480	550[D]	12
	550	550	620[D]	10
HSLAS Type B	340	340	410[D]	22
	410	410	480[D]	18
	480	480	550[D]	14
	550	550	620[D]	12

[A] Where an ellipsis (. . .) appears, there is no requirement.
[B] If the hardness result is 85 HRB or higher, no tension test is required.
[C] As there is no discontinuous yield curve, the yield strength should be taken as the stress at 0.5 % elongation under load or 0.2 % offset.
[D] If a higher tensile strength is required, the user should consult the producer.

TABLE 5 Typical Ranges of Mechanical Properties (Nonmandatory) (Longitudinal Direction)[A,B]

Designation	Yield Strength		Elongation, %	r_m Value[C]	n Value[D]
	ksi	[MPa]			
CS Type A	25/50	[170/345]	≥20	[E]	[E]
CS Type B	30/50	[205/345]	≥20	[E]	[E]
CS Type C	25/55	[170/380]	≥15	[E]	[E]
FS	25/45	[170/310]	≥26	1.0/1.4	0.17/0.21
DDS[F]	20/35	[140/240]	≥32	1.2/1.7	0.19/0.24
EDDS[F]	18/30	[125/205]	≥38	1.5/2.0	0.21/0.26
FSS Type 409	25/50	[170/345]	≥20	[E]	[E]
FSS Type 439	30/60	[205/415]	≥22	[E]	[E]

[A] The typical mechanical property values presented here are nonmandatory. They are intended solely to provide the purchaser with as much information as possible to make an informed decision on the steel to be specified. Values outside of these ranges are to be expected. The purchaser may negotiate with the supplier if a specific range or a more restrictive range is required for the application.
[B] These typical mechanical properties apply to the full range of steel sheet thicknesses. The yield strength tends to increase and some of the formability values tend to decrease as the sheet thickness decreases.
[C] r_m *Value*—Average plastic strain ratio as determined by the method in Test Method E 517.
[D] n *Value*—Strain-hardening exponent as determined by the method in Test Method E 646.
[E] No typical mechanical properties have been established.
[F] DDS and EDDS are available only as Coating Type 1 steel sheet.

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reasonably good shop forming practices. Where possible, the use of larger radii or "easy way" bends are recommended for improved performance.

7.4.2 Fabricators should be aware that cracks may initiate upon bending a sheared edge. This is not considered to be a fault of the steel but is rather a function of the induced cold-work.

8. Coating Properties

8.1 *Coating Weight [Mass]*—Coating weight [mass] shall conform to the requirements as shown in Table 1 for the specific coating designation.

8.2 *Coating Weight [Mass] Tests*:

8.2.1 Coating weight [mass] tests shall be performed in accordance with the requirements stated in Specification A 924/A 924M.

8.2.2 The referee method to be used shall be Test Method A 428.

8.3 *Coating Bend Test*:

8.3.1 The bend test specimens of coated sheet shall be capable of being bent through 180° in any direction without flaking of the coating on the outside of the bend only. For all designations the coating bend test inside diameter shall be equal to twice the thickness of the specimen. Flaking of the coating within 0.25 in. [6 mm] of the edge of the bend specimen shall not be cause for rejection.

8.3.2 Coating bend test specimens shall be taken in accordance with Specification A 924/A 924M.

9. Retests and Disposition of Non-Conforming Material

9.1 Retests, conducted in accordance with the requirements of the section on Retests and Disposition of Non-Conforming Material of Specification A 924/A 924M, are permitted when an unsatisfactory test result is suspected to be the consequence of the test method procedure.

9.2 Disposition of non-conforming material shall be subject to the requirements of 9.2 of Specification A 924/A 924M.

10. Dimensions and Permissible Variations

10.1 All dimensions and permissible variations shall comply with the requirements of Specification A 924/A 924M.

11. Keywords

11.1 aluminum-coated steel; coatings—aluminum; metallic coatings; steel sheet—aluminum coated

APPENDIXES

(Nonmandatory Information)

X1. BENDING PROPERTIES

X1.1 Table X1.1 shows suggested minimum inside radii for cold bending.

TABLE X1.1 Suggested Minimum Inside Radii for Cold Bending[A]

NOTE 1—t = radius equivalent to the steel thickness.

NOTE 2—The suggested radii should be used as minimums for 90° bends in actual shop practice.

Designation	Minimum Inside Radius for Cold Bending
CS, FS, DDS, EDDS, and FSS	0 t
SS	1½ t

[A] Material that does not perform satisfactorily when fabricated in accordance with the requirements of Table X1.1 may be subject to rejection pending negotiation with the steel supplier.

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X2. RELATIONSHIP BETWEEN COATING WEIGHT [MASS] AND THICKNESS

X2.1 *Aluminum Type 1 Coatings*—Table X2.1 provides factors for converting between coating weight [mass] and thickness, and between values in inch-pound units and SI units.

TABLE X2.1 Conversion Factors Between Coating Weight [Mass] and Thickness[A]

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	g/m^2	mils	μm
1.0	305.15[B]	3.98	101.09[B]
0.00328[B]	1.0	0.01304[B]	0.33128[B]
0.25126[B]	76.672[B]	1.0	25.4[B]
0.00989[B]	3.0186[B]	0.03937[B]	1.0

[A] One ounce of Type 1 aluminum coating per square foot of surface corresponds to an average coating thickness of 0.00398 in., based on a density of 0.109 $lb/in.^3$. All other values in Table X2.1 are based on this relationship and on standard inch-pound to SI conversions.

[B] Weight [mass] to thickness conversions are reliable to only two significant figures. Inch-pound to SI conversions are reliable to five significant figures. A greater number of digits are shown in Table X2.1 to reduce errors due to rounding when calculating equivalencies for coating weight [mass] or thickness greater than unity.

X2.2 *Aluminum Type 2 Coatings*—Table X2.2 provides factors for converting between coating weight [mass] and thickness, and between values in inch-pound units and SI units.

TABLE X2.2 Conversion Factors Between Coating Weight [Mass] and Thickness[A]

Coating Weight [Mass]		Coating Thickness	
oz/ft^2	g/m^2	mils	μm
1.0	305.15[B]	3.74	94.996[B]
0.00328[B]	1.0	0.012256[B]	0.31131[B]
0.26738[B]	81.591[B]	1.0	25.4[B]
0.010527[B]	3.2122[B]	0.03937[B]	1.0

[A] One ounce of Type 2 aluminum coating per square foot of surface corresponds to an average coating thickness of 0.00374 in., based on a density of 0.116 $lb/in.^3$. All other values in Table X2.2 are based on this relationship and on standard inch-pound to SI conversions.

[B] Weight [mass] to thickness conversions are reliable to only two significant figures. Inch-pound to SI conversions are reliable to five significant figures. A greater number of digits are shown in Table X2.2 to reduce errors due to rounding when calculating equivalencies for coating weight [mass] or thickness greater than unity.

X3. RATIONALE FOR CHANGES IN PRODUCT DESIGNATIONS

X3.1 Subcommittee A05.11 has revised the designations used to classify the various products available in each hot-dip coated specification. The previous "Quality" designations (Commercial Quality (CQ), Drawing Quality (DQ), etc.,) have been replaced with designations and descriptions more closely related with product characteristics. Many of the former "Quality" specifications described the steel only in terms of limited chemical composition, which in some cases was identical for two or more qualities. The former designations also did not reflect the availability of new steels that are the result of the use of new technologies, such as vacuum degassing and steel ladle treatments.

X3.1.1 The former "Quality" designators, defined in very broad qualitative terms, did not provide the user with all of the information needed to select the appropriate steel for an application. The new designations are defined with technical information, such as specific chemical composition limits and typical nonmandatory mechanical properties. These steel characteristics are important to users concerned with the weldability and formability of the coated steel products. The typical mechanical properties included in the new designation system are those indicated by the tension test. These properties are more predictive of steel formability than other tests, such as the hardness test, which may not compensate adequately for product variables such as substrate thickness and coating weight.

X3.1.2 The new designations also provide the user with the flexibility to restrict the steels applied on any order. For example, a user can restrict the application of ultra-low carbon steels through the selection of an appropriate "type" designator.

X3.1.3 There is a limited relationship between the former and current system of designation. Some of the reasons for this limited relationship are the following: the addition of steels not previously described in ASTM specifications; restrictions placed on ranges of chemical composition; the addition of typical mechanical properties; and the enhanced capability of steel producers to combine chemical composition and processing methods to achieve properties tailored to specific applications.

X3.1.4 The changes in designation are significant, which may create transition issues that will have to be resolved. Continuing dialogue between users and producers will have to be maintained to assist in the transition to the new designation system. A user with concerns about the appropriate coated steel to order for a specific application should consult with a steel supplier or producer.

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SUMMARY OF CHANGES

Committee A05 has identified the location of selected changes to this standard since the last issue (A 463/A 463 - 01a) that may impact the use of this standard. (November 15, 2006)

(*1*) Added new Section 9.
(*2*) Added boron reporting requirement to Table 2.
(*3*) Defined boron reporting precision in 6.1.2.

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