



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

409 Alloy

<u>409.2</u> ^{25,33}		
Si	9.0 - 10.0	
Fe	0.6 - 1.3	
Cu	0.10	
Mn	0.10	
Mg		
Cr		
Ni		
Zn	0.10	
Ti		
Sn		
Others EA	0.10	
Others Tot	0.20	
Al	BAL	

Footnote *25 / 409.2 & 445.2 are used to coat steel.

Footnote *33 / See last page for description

Questions? – CALL 708.757.4200

Great Ingot = Great Castings



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

413 Alloy

<u>413.0</u> ¹¹		<u>413.2</u> ³³	
Si	11.0 - 13.0	Si	11.0 - 13.0
Fe	2.0	Fe	0.7 - 1.1
Cu	1.0	Cu	0.10
Mn	0.35	Mn	0.10
Mg	0.10	Mg	0.07
Cr		Cr	
Ni	0.50	Ni	0.10
Zn	0.50	Zn	0.10
Ti		Ti	
Sn	0.15	Sn	0.10
Others EA		Others EA	
Others Tot	0.25	Others Tot	0.20
Al	BAL	Al	BAL

Footnote *11 / A360.1, A380.1 and A413.1 ingot is used to produce 360.0 and A360.0; 380.0 and A380.0; 413.0 and A413.0 castings, respectively.

Footnote *33 / See last page for description

Questions? – CALL 708.757.4200

Great Ingot = Great Castings



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

A413 Alloy

<u>A413.0</u> ¹¹		<u>A413.1</u> ^{11,33}		<u>A413.2</u> ³³	
Si	11.0 - 13.0	Si	11.0 - 13.0	Si	11.0 - 13.0
Fe	1.3	Fe	1.0	Fe	0.6
Cu	1.0	Cu	1.0	Cu	0.10
Mn	0.35	Mn	0.35	Mn	0.05
Mg	0.10	Mg	0.10	Mg	0.05
Cr		Cr		Cr	
Ni	0.50	Ni	0.50	Ni	0.05
Zn	0.50	Zn	0.40	Zn	0.05
Ti		Ti		Ti	
Sn	0.15	Sn	0.15	Sn	0.05
Others EA		Others EA		Others EA	
Others Tot	0.25	Others Tot	0.25	Others Tot	0.10
Al	BAL	Al	BAL	Al	BAL

Footnote *11 / A360.1, A380.1 and A413.1 ingot is used to produce 360.0 and A360.0; 380.0 and A380.0; 413.0 and A413.0 castings, respectively.

Footnote *33 See last page for description

Questions? – CALL 708.757.4200

Great Ingot = Great Castings



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

B413 Alloy

<u>B413.0</u>		<u>B413.1</u> ³³	
Si	11.0 - 13.0	Si	11.0 - 13.0
Fe	0.50	Fe	0.40
Cu	0.10	Cu	0.10
Mn	0.35	Mn	0.35
Mg	0.05	Mg	0.05
Cr		Cr	
Ni	0.05	Ni	0.05
Zn	0.10	Zn	0.10
Ti	0.25	Ti	0.25
Sn		Sn	
Others EA	0.05	Others EA	0.05
Others Tot	0.20	Others Tot	0.20
Al	BAL	Al	BAL

Footnote *33 See last page for description

Questions? – CALL 708.757.4200



Great Ingot = Great Castings

Main Office/Plant
900 E 14th Street
Chicago, Hts, IL 60411
PH 708.757.4200
FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net

Direct - 708.898.9903

Direct - 330.495.7770 - fax 330.491.0308

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

435 Alloy

<u>435.2</u> ^{27,33}	
Si	3.3 - 3.9
Fe	0.40
Cu	0.05
Mn	0.05
Mg	0.05
Cr	
Ni	
Zn	0.10
Ti	
Sn	
Others EA	0.05
Others Tot	0.20
Al	BAL

Footnote*27 / Used with zinc to coat steel.

Footnote *33 / See last page for description

Questions? – CALL 708.757.4200



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

443 Alloy

<u>443.0</u>		<u>443.1</u> ³³		<u>443.2</u> ³³	
Si	4.5 - 6.0	Si	4.5 - 6.0	Si	4.5 - 6.0
Fe	0.8	Fe	0.6	Fe	0.6
Cu	0.6	Cu	0.6	Cu	0.10
Mn	0.50	Mn	0.50	Mn	0.10
Mg	0.05	Mg	0.05	Mg	0.05
Cr	0.25	Cr	0.25	Cr	
Ni		Ni		Ni	
Zn	0.50	Zn	0.50	Zn	0.10
Ti	0.25	Ti	0.25	Ti	0.20
Sn		Sn		Sn	
Others EA		Others EA		Others EA	0.05
Others Tot	0.35	Others Tot	0.35	Others Tot	0.15
Al	BAL	Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

A443 Alloy

<u>A443.0</u>		<u>A443.1</u> ³³	
Si	4.5 - 6.0	Si	4.5 - 6.0
Fe	0.8	Fe	0.6
Cu	0.30	Cu	0.30
Mn	0.50	Mn	0.50
Mg	0.05	Mg	0.05
Cr	0.25	Cr	0.25
Ni		Ni	
Zn	0.50	Zn	0.50
Ti	0.25	Ti	0.25
Sn		Sn	
Others EA		Others EA	
Others Tot	0.35	Others Tot	0.35
Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

B443 Alloy

<u>B443.0</u>		<u>B443.1 ³³</u>	
Si	4.5 - 6.0	Si	4.5 - 6.0
Fe	0.8	Fe	0.6
Cu	0.15	Cu	0.15
Mn	0.35	Mn	0.35
Mg	0.05	Mg	0.05
Cr		Cr	
Ni		Ni	
Zn	0.35	Zn	0.35
Ti	0.25	Ti	0.25
Sn		Sn	
Others EA	0.05	Others EA	0.05
Others Tot	0.15	Others Tot	0.15
Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

C443 Alloy

<u>C443.0</u>		<u>C443.1 ³³</u>		<u>C443.2 ³³</u>	
Si	4.5 - 6.0	Si	4.5 - 6.0	Si	4.5 - 6.0
Fe	2.0	Fe	1.1	Fe	0.7 - 1.1
Cu	0.6	Cu	0.6	Cu	0.10
Mn	0.35	Mn	0.35	Mn	0.10
Mg	0.10	Mg	0.10	Mg	0.05
Cr		Cr		Cr	
Ni	0.50	Ni	0.50	Ni	
Zn	0.50	Zn	0.40	Zn	0.10
Ti		Ti		Ti	
Sn	0.15	Sn	0.15	Sn	
Others EA		Others EA		Others EA	0.05
Others Tot	0.25	Others Tot	0.25	Others Tot	0.15
Al	BAL	Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

444 Alloy

<u>444.0</u>		<u>444.2 ³³</u>	
Si	6.5 - 7.5	Si	6.5 - 7.5
Fe	0.6	Fe	0.13 - 0.25
Cu	0.25	Cu	0.10
Mn	0.35	Mn	0.05
Mg	0.10	Mg	0.05
Cr		Cr	
Ni		Ni	
Zn	0.35	Zn	0.05
Ti	0.25	Ti	0.20
Sn		Sn	
Others EA	0.05	Others EA	0.05
Others Tot	0.15	Others Tot	0.15
Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

A444 Alloy

<u>A444.0</u>		<u>A444.1</u> ³³		<u>A444.2</u> ³³	
Si	6.5 - 7.5	Si	6.5 - 7.5	Si	6.5 - 7.5
Fe	0.20	Fe	0.15	Fe	0.12
Cu	0.10	Cu	0.10	Cu	0.05
Mn	0.10	Mn	0.10	Mn	0.05
Mg	0.05	Mg	0.05	Mg	0.05
Cr		Cr		Cr	
Ni		Ni		Ni	
Zn	0.10	Zn	0.10	Zn	0.05
Ti	0.20	Ti	0.20	Ti	0.20
Sn		Sn		Sn	
Others EA	0.05	Others EA	0.05	Others EA	0.05
Others Tot	0.15	Others Tot	0.15	Others Tot	0.15
Al	BAL	Al	BAL	Al	BAL

Footnote *33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
900 E 14th Street
Chicago, Hts, IL 60411
PH 708.757.4200
FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

xxx.0 Casting Spec -- xxx.1 Secondary Ingot Spec -- xxx.2 Primary Ingot Spec

445 Alloy

<u>445.2</u> ^{25,33}	
Si	6.5 - 7.5
Fe	0.6 - 1.3
Cu	0.10
Mn	0.10
Mg	
Cr	
Ni	
Zn	0.10
Ti	
Sn	
Others EA	0.10
Others Tot	0.20
Al	BAL

Footnote *25 / 409.2 & 445.2 are used to coat steel.

Footnote*33 / See last page for description



Great Ingot = Great Castings

Main Office/Plant
 900 E 14th Street
 Chicago, Hts, IL 60411
 PH 708.757.4200
 FX 708.757.3933
www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net
 Direct - 708.898.9903

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net
 Direct - 330.495.7770 - fax 330.491.0308

Questions? – CALL 708.757.4200

Great Ingot = Great Castings

***33 -- Identifiers for 3xx.x & 4xx.x Foundry Ingot
 Containing Structure Modifiers**

One of the applicable suffixes in the table below should be added to the registered alloy designation whenever a structure modifier is intentionally added to that alloy.

Alloy Designation Suffix	Structure Modifying Element	Chemical Composition Limits	
		Min (%)	Max (%)
N	Na	0.003	0.080
S	Sr	0.005	0.080
C	Ca	0.005	0.150
P	P	—	0.060

The letter suffix follows and is separated from the registered foundry ingot designations by a hyphen (e.g. "A356.1 - S").

In cases where more than one modifier is intentionally added, only the modifier of greater concentration shall be identified by suffix letter affixed to the registered alloy designation.

When a foundry alloy is sold with a suffix added to its alloy designation, the modifying element's concentration is not to be included in "Others, EA" or "Others, TOT".



Great Ingot = Great Castings

Main Office/Plant
900 E 14th Street
Chicago, Hts, IL 60411
PH 708.757.4200
FX 708.757.3933

www.trialco.net

Mr. Jay Armstrong / President / armstrong@trialco.net

Mr. Richard A. Milnes / Director of Sales / milnes@trialco.net

Direct - 708.898.9903

Direct - 330.495.7770 - fax 330.491.0308

It is not intended that these structure modifier identifiers be treated as new alloy registration, nor should these designations be listed.