M.A. FORD
High Performance Cutting Tools

*Where **high performance** is the **standard**®*

Custom Tool Division Section
Product Catalog
2020

Including

M.A. FORD
High Performance Cutting Tools
ADVANCED PRODUCT GROUP

www.maford.com

M.A. FORD®
High Performance Cutting Tools

*Where **high performance** is the **standard**®*

For 100 years, M.A. FORD® has been at the cutting edge of tooling design and manufacturing and has developed an enviable global reputation for performance and precision in advanced solid carbide tooling, serving over 60 countries worldwide.

Our innovative cutting geometries, materials and coating technologies are providing effective manufacturing solutions to an expanding and increasingly diverse range of industries from agriculture and construction to aerospace, power generation and automotive, to name but a few.

M.A. FORD® – Where high performance is the standard.®

⚠ **WARNING:** This product can expose you to chemicals including nickel, cobalt, and lead, which are known to the State of California to cause cancer, and chemicals including lead which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

www.maford.com Phone: 800-553-8024 or 563-391-6220 Email: sales@maford.com

Custom Tool Division Page 482-483

Coatings Page 485

M.A. Ford® PCD 486-491

Firearm Arsenal 492-494

Material Conversion Chart Page 498-503

Need a coated tool?

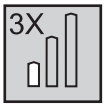
Any uncoated standard catalog tool can be coated - Contact Customer Service for available options.

Icon Glossary

Drill Icons


Solid Carbide


Coolant Fed



Drill Length

Drill Point Angle

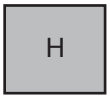
Helix Angle

Coatings

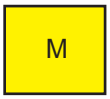
DIN Specs

Workpiece Material Group

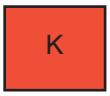
Steels



Hardened Steels (35-65Rc)



Stainless Steels



Cast Iron

Special Alloys

Non-Ferrous

HP Drill Selection Chart See Page 16, 137.
Drill Terminology See Page 176.

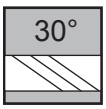
End Mill Icons

Number of Flutes


Center Cutting

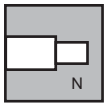

Lengths

Coatings



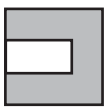
Helix Angle

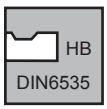

Ball Nose



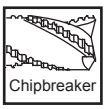
Neck Relief


Corner Radius


Shank



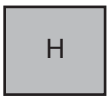
Shank/DIN



Chipbreaker

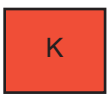
Workpiece Material Group

Steels



Hardened Steels (35-65Rc)

Stainless Steels



Cast Iron

Special Alloys

Non-Ferrous

End Mill Terminology See Page 384.

M.A. FORD®

High Performance Cutting Tools

ADVANCED PRODUCT GROUP

CUSTOM Tool Division

Engineering & Manufacturing Excellence

M.A. Ford® PCD

FIREARMS ARSENAL

BlueSwarf

THE PERFECT CHIP

CERAedge®

CUSTOM Tool Division

Engineering & Manufacturing Excellence

The M.A. Ford® Custom Tool Division focuses on meeting the growing need for unique and increasingly complex special cutting tools. By partnering with select machine tool users the Custom Tool Division develops and supplies custom engineered carbide tools of unmatched quality which meet or exceed their productivity, delivery and utilized cost expectations. Custom tools are proven to increase speeds and feeds, save setup and handling time which in turn leads to faster run times, more efficient manufacturing and most importantly, INCREASED PROFITS.

To support your productivity improvement efforts, we offer the following services:

- Technical assistance in prototype custom tool design.
- Re-engineering of existing custom tooling to optimize tool performance.
- Tool manufacturing lead times which meet or exceed your delivery requirements.
- Immediate response to quotation request.
- Readily available technical phone support.
- Field representative support service.
- Emergency tool service.
- Custom tools of the highest quality.

Custom Tool Division
Advanced Product Group

Meeting the growing need for unique and increasingly complex high performance custom cutting tools in today's industry

Engineering the growing need for unique and increasingly complex high performance custom cutting tools in today's industry

M.A. Ford® 's Custom Tool Division can provide customized tooling solutions designed specifically to your application needs. M.A. Ford's Custom Tool Division can provide a tooling solution that will greatly reduce your machining costs, and improve your bottom line.

We offer application development, design and manufacturing expertise in the following product classifications: All tools in either Solid or Coolant Thru Configurations.

- High Performance Drills and Step Drills.
- Rockbit Drills (Flat Bottom - 150°).
- G-Drills and Step G-Drills.
- Step Reamers.
- Reamers.
- Coolant Thru Specials.
- Firearms Reamers (Chamber - Barrel - Muzzle - Throat).
- Custom End Mills.
- Custom Form Tools.
- Re-conditioning.
- Custom PCD tools.
- Brazed Carbide Tipped Specials.

Call us today to increase your productivity and profits with Custom Tooling

1-877-522-2885

e-mail: customtools@maford.com

QUALITY

intertek
Total Quality. Assured.

CERTIFICATE
OF REGISTRATION

This is to certify that the management system of:

M.A. Ford Mfg. Co., Inc.

Main Site: 7737 N.W. Boulevard
Davenport, Iowa 52808
United States

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

The design and manufacture of precision rotary cutting tools.

Certificate Number:
98-1247g

Initial Certification Date:
30 October 1998

Date of Certification Decision:
11 September 2018

Issuing Date:
11 September 2018

Valid Until:
10 September 2021

ANAB ACCREDITED

Calin Moldovean
President, Business Assurance

Intertek Testing Services NA, Inc.,
900 Chelmsford Street,
Lowell, MA 01851,
USA.

The M.A. Ford® Quality Policy is:

Know our customers.
Know their requirements.
Make continual improvements in satisfying those requirements.

These are the responsibilities of every individual who works at M.A. Ford®.

Steve Morency

Steve Morency, CEO

M.A. FORD®
High Performance Cutting Tools

Coatings

ALtima®
Aluminum Titanium Nitride (AlTiN). ALtima® is the original high performance coating. This coating allows tools to be run at higher speeds and feeds in a wide array of materials. Also, it allows the option of running tools dry due to the high oxidation temperature of the coating.

ALtima® Plus
This Aluminum Titanium Nitride (AlTiN) multi-layer coating has optimized coating structure, with pre and post treatment of the coating for optimized high performance drilling in any ferrous material.

ALtima® 52
Aluminum Titanium Nitride (AlTiN). ALtima® 52 is specially designed for milling hardened steels 52 Rc and above. It has very high hardness and the oxidation temperature of the coating makes this the absolute best choice for hardened steel milling. ALtima® 52 is designed to allow for dry machining.

ALtima® Blaze
Aluminum Chromium Nitride (AlCrN). ALtima® Blaze is designed to allow higher material removal rates. This coating has a higher oxidation temperature than a typical TiAlN coating. It has shown very good results in nickel alloys, titanium, and other difficult to machine materials. Tools coated with ALtima® Blaze can be used in dry machining.

ALtima® Micro
An ultra thin, nano structured, TiAlN coating developed specifically for micro tool applications.

ALtima® Xtreme
Designed for high speed and dry machining.

Fordlube
Titanium DiBoride (TiB_2) is a unique coating with low Aluminum affinity, smooth surface finish and high hardness. It is ideal for Aluminum and Magnesium alloys as it prevents build-up on cutting edge, provides superior chip flow along with extended wear resistance.

Gem+
Recommended for aluminium and aluminium alloys up to 12% Si, non-ferrous metals and composites. Gem+ provides excellent wear resistance and maintains sharp cutting edges.

GemX
A CVD diamond coating for composites and aluminum that offers the maximum hardness and wear resistance of any of our coatings.

TiN
Titanium Nitride (TiN). TiN coating has shown good results in low carbon steels and many iron-based applications. It is a very popular coating used in the industry today.

TiCN
Titanium Carbonitride (TiCN). TiCN is a multi-layer coating. Because of the multi-layer composition, TiCN is tougher than TiN, even though TiCN is harder. The added toughness of the TiCN coating makes it a good choice for mechanically stressed edges like in end mill applications. The higher hardness makes TiCN a good choice for abrasive applications where higher wear resistance is required.

CERAedge®
CERAedge® is a unique coating that provides excellent performance in titanium, aluminium, and composites.

Special Coatings
Upon request, M.A. Ford® can provide any commercially available coating. **Any standard uncoated M.A. Ford® cutting tool can be provided with coating if requested.**

Coating Properties

M.A. Ford® Coating	M.A. Ford® Tool Number Designation	Microhardness (HV)	Maximum Service Temp.	Friction Coefficient
ALtima®	A	3100	1100° C / 2012° F	0.42
ALtima® Plus	AP	3200	1100° C / 2012° F	0.25
ALtima® 52	A or AH	3600	1200° C / 2192° F	0.40
ALtima® Blaze	B	3200	1100° C / 2012° F	0.35
ALtima® Micro	AM	3300	900° C / 1652° F	0.30-0.35
ALtima® Xtreme	AX	3800	1100° C / 2012° F	0.30-0.50
Fordlube	F	4000	700° C / 1292° F	0.30
Gem+	GP	4710	500° C / 932° F	0.30
GemX	GX	10000	600° C / 1100° F	0.10
TiN	T	2300	600° C / 1112° F	0.40
TiCN	C	3000	400° C / 752° F	0.40
CERAedge®	CE	3400	1100° C / 2012° F	0.25

M.A. Ford® PCD

M.A. Ford® PCD, a part of M.A. Ford®'s Advanced Product Group, features a wide range of high performance, Polycrystalline Diamond (PCD) tipped tools to improve your productivity.

PCD tooling is ideal for more efficient machining of non-ferrous metals, plastics, composite materials, graphite and other hard to machine and abrasive materials.

M.A. Ford® PCD offers end mills and drills. Special tools are quoted upon request.

M.A. Ford® PCD is dedicated to continually developing innovative products manufactured with efficient state-of-the-art technology while offering great value and top quality at reasonable prices.

High Performance PCD Diamond Tools

- DES (M.A. Ford® PCD End Mill Square) Series - 1 & 2 Flutes, see page 487
- DES (M.A. Ford® PCD End Mill Square) Series - Multi-Flute, see page 488
- DEB (M.A. Ford® PCD End Mill Ball) Series, see page 489
- Custom Tool Division - Custom Tooling Solutions
  - DWD (M.A. Ford® PCD Cross Center Tip Drill) Series, see page 490
  - PCD Specials, see page 491

Inch	
D1	Tolerance
1/8" - 3/16"	+0/-.001
1/4" & above	+0/-.002

Inch	
D2	Tolerance (h6)
1/8" - 3/16"	+0/-.00031
1/4" - 3/8"	+0/-.00035
1/2" - 5/8"	+0/-.00043
3/4"	+0/-.00051

Inch	
L1	Tolerance
All Sizes	+/- .040

Inch	
L2	Tolerance
All Sizes	+.040/-.000

Inch	
R	Tolerance
All Sizes	+0/-.001

Metric	
D1	Tolerance
3mm - 20mm	+0/-.050

Metric	
D2	Tolerance (h6)
3mm	+0/-.006
4mm - 6mm	+0/-.008
8mm - 10mm	+0/-.009
12mm - 16mm	+0/-.011
20mm	+0/-.013

Metric	
L1	Tolerance
All Sizes	+/- 1

Metric	
L2	Tolerance
All Sizes	+1/-0

Metric	
R	Tolerance
All Sizes	+0/-.025

M.A. Ford® PCD End Mill Numbering System - Inch

First Character	Second Character	Third Character	Fourth Character	Fifth Character	Sixth Character	Seventh Character	Eighth Character
Diamond	End Mill	No. of Flutes	End Style	Nominal Cutting Diameter	Nominal Cutting Diameter	Nominal Cutting Diameter	Nominal Cutting Diameter
D	**E**	**1**	**S**	**1**	**2**	**5**	**0**
	E=End Mill		S=Square End B=Ball End				

M.A. Ford® PCD End Mill Numbering System - Metric

Diamond	End Mill	No. of Flutes	End Style	Metric	Nominal Cutting Diameter	Nominal Cutting Diameter	Nominal Cutting Diameter	Nominal Cutting Diameter
D	E	1	S	M	0	3	0	0
	E=End Mill		S=Square End B=Ball End					

DES (M.A. Ford® PCD End Mill Square) Series

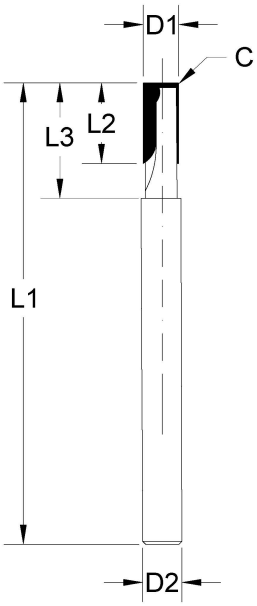
A straight flute PCD tipped end mill available with 1 or 2 flutes depending on tool size and configuration. These end mills combine a PCD tip with a carbide body for maximum rigidity and optimal performance. Offers excellent results in CFRP (Carbon-Fiber-Reinforced Polymer), fiberglass, aluminum and other very abrasive materials.

Standard Flute PCD Flat End Mills - Inch

Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	C	# of Flutes
DE1S1250	90100	1/8	1/8	1-1/2	1/4	.625	.005	1
DE1S1875	90101	3/16	3/16	2	5/16	.875	.005	1
DE2S2500	90102	1/4	1/4	2	3/8	.875	.010	2
DE2S3750	90103	3/8	3/8	2-1/2	1/2	1	.010	2
DE2S5000	90104	1/2	1/2	3	5/8	1-3/8	.010	2
DE2S6250	90105	5/8	5/8	3-1/2	7/8	1-3/4	.010	2
DE2S7500	90106	3/4	3/4	4	1	2	.015	2

Additional sizes available upon request.
Multi-flute styles on page 488.



Standard Flute PCD Flat End Mills - Metric

Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	C	# of Flutes
DE1SM0300	90107	3	3	38	6	14	.130	1
DE1SM0400	90108	4	4	50	6	15	.130	1
DE2SM0500	90109	5	5	50	8	18	.250	2
DE2SM0600	90110	6	6	64	10	22	.250	2
DE2SM0601	90111	6	6	64	15	26	.250	2
DE2SM0800	90112	8	8	64	10	24	.250	2
DE2SM0801	90113	8	8	64	15	29	.250	2
DE2SM1000	90114	10	10	75	15	30	.250	2
DE2SM1200	90115	12	12	75	15	30	.250	2
DE2SM1201	90116	12	12	75	25	40	.250	2
DE2SM1600	90117	16	16	92	20	42	.250	2
DE2SM2000	90118	20	20	100	25	50	.250	2

Additional sizes available upon request.
Multi-flute styles on page 488.

TECH
Page 489

DES (M.A. Ford® PCD End Mill Square) Series

A straight flute PCD tipped end mill available from 3 flutes to 9 flutes depending on tool size and configuration. These end mills combine a PCD tip with a carbide body for maximum rigidity and optimal performance. Offers excellent results in CFRP (Carbon-Fiber-Reinforced Polymer), fiberglass, aluminum and other very abrasive materials.

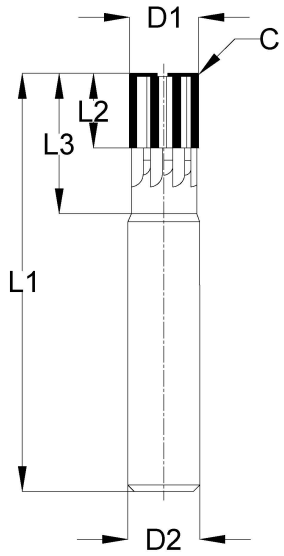
Standard Multi-Flute PCD Flat End Mills - Inch

Non-Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	C	# of Flutes
DE3S3750	90143	3/8	3/8	2-1/2	1/2	1	.010	3
DE5S3750	90144	3/8	3/8	2-1/2	1/2	1.15	.010	5
DE3S5000	90145	1/2	1/2	3	1/2	1-1/4	.010	3
DE5S5000	90146	1/2	1/2	3	1/2	1-1/4	.010	5
DE7S5000	90147	1/2	1/2	3	1/2	1-1/4	.010	7
DE9S5000	90148	1/2	1/2	3	1/2	1-1/4	.010	9
DE3S6250	90149	5/8	5/8	3-1/2	5/8	1-1/2	.010	3
DE5S6250	90150	5/8	5/8	3-1/2	5/8	1-3/8	.010	5
DE7S6250	90151	5/8	5/8	3-1/2	5/8	1-3/8	.015	7
DE9S6250	90152	5/8	5/8	3-1/2	5/8	1-3/8	.015	9

Additional sizes available upon request.

1 and 2 flute styles on page 487.



Standard Multi-Flute PCD Flat End Mills - Metric

Non-Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	C	# of Flutes
DE3SM0800	90153	8	8	64	11	26	.250	3
DE3SM1000	90154	10	10	75	13	30	.250	3
DE5SM1000	90155	10	10	75	13	30	.250	5
DE3SM1200	90156	12	12	75	13	32	.250	3
DE5SM1200	90157	12	12	75	13	32	.250	5
DE7SM1200	90158	12	12	75	13	32	.250	7
DE9SM1200	90159	12	12	75	13	32	.250	9
DE3SM1600	90160	16	16	92	16	38	.250	3
DE5SM1600	90161	16	16	92	16	42	.250	5
DE7SM1600	90162	16	16	92	16	42	.250	7
DE9SM1600	90163	16	16	92	16	37	.250	9

Additional sizes available upon request.

1 and 2 flute styles on page 487.

TECH
Page 489

DEB (M.A. Ford® PCD End Mill Ball) Series

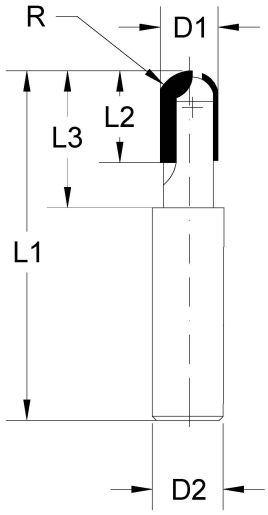
A straight flute PCD tipped ball nose end mill available in 1 or 2 flutes depending on tool size. These end mills combine a PCD tip with a carbide body for maximum rigidity and optimal performance. Offers excellent results in CFRP (Carbon-Fiber-Reinforced Polymer), fiberglass, aluminum and other very abrasive materials.

Standard Flute PCD Ball End Mills - Inch

Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	# of Flutes
DE1B1250	90119	1/8	1/8	1-1/2	1/4	.650	1
DE1B1875	90120	3/16	3/16	2	5/16	.875	1
DE2B2500	90121	1/4	1/4	2	3/8	.875	2
DE2B3750	90122	3/8	3/8	2-1/2	1/2	1	2
DE2B5000	90123	1/2	1/2	3	5/8	1-1/2	2
DE2B6250	90124	5/8	5/8	3-1/4	7/8	1-3/4	2
DE2B7500	90125	3/4	3/4	4	1	2	2

Additional sizes available upon request.



Standard Flute PCD Ball End Mills - Metric

Center Cutting

Tool No.	EDP	D1	D2	L1	L2	L3	# of Flutes
DE1BM0300	90126	3	3	38	6	15	1
DE1BM0400	90127	4	4	50	6	17	1
DE1BM0500	90128	5	5	50	8	20	1
DE2BM0600	90129	6	6	64	10	24	2
DE2BM0800	90130	8	8	64	10	27	2
DE2BM1000	90131	10	10	75	15	35	2
DE2BM1200	90132	12	12	75	15	35	2
DE2BM1600	90133	16	16	92	20	42	2
DE2BM2000	90134	20	20	100	25	50	2

Additional sizes available upon request.

Safety Note
Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded.

CFRP Milling Parameters

DES & DEB Series

Diameter	Speed	Speed	Feed
inch	SFM	RPM	IPT
3/16	450	9168	0.0030
1/4	450	6876	0.0040
3/8	450	4584	0.0045
1/2	450	3438	0.0050
5/8	450	2750	0.0060

DES & DEB Series

Diameter	Speed	Speed	Feed
mm	SMM	RPM	mmPT
5	140	9168	0.0800
6	140	6876	0.1000
10	140	4584	0.1150
12	140	3438	0.1300
16	140	2750	0.1500

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

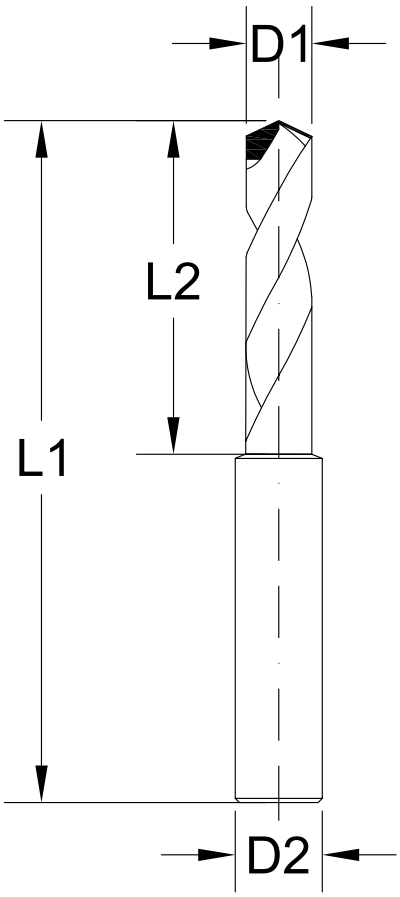
To order M.A.Ford® PCD Specials contact M.A. Ford® Custom Tool Division

DWD (M.A.Ford® PCD Cross Center Tip Drill)

The cross center tip drill offers excellent performance in CFRP (Carbon-Fiber-Reinforced Polymer), fiberglass, aluminum and other very abrasive materials. Available as a special from 1/8" to 5/8" and 3mm to 16mm.

1. Fill in information requested on drawing.
2. E-mail M.A. Ford at sales@maford.com.

☐ **Request approval drawing**



D1= _____

D2= _____

L1= _____

L2= _____

Customer Name: _____

Phone: _____ e-mail: _____

Distributor: _____

Quantities (2 pc. minimum) _____

M.A. Ford® PCD

To order M.A.Ford® PCD Specials contact M.A. Ford® Custom Tool Division

PCD Specials

Drills and Step Drills • Reamers and Step Reamers • Form Tools • Step and Multi-Step Tools • Re-conditioning and Re-tipping

Contact: M.A. Ford® Custom Tool Division
Ph: 877-522-2885
Fax: 877-502-9521
customtools@maford.com

FIREARMS ARSENAL

The Custom Tool Division currently manufactures a variety of custom firearm solid carbide cutting tools. All of our firearms tools are custom made for the manufacturer's application. All tools are designed from customer prints or basic concepts provided from SAAMI specifications.

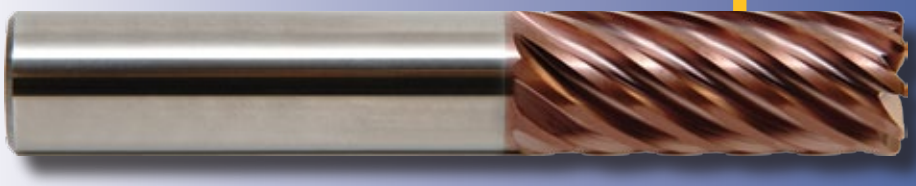
Tapered Pin Reamers	Made to order sizing	
180 Slide Finishing End Mills	1/4" - 1"	6.0 - 20.0 mm
380 9 Flute Finishing End Mills	3/8" - 3/4"	8.0 - 20.0 mm
334 Magazine Rougher	1/4" - 1"	N/A
Rail Cutters	Made to order sizing	
Chamber Reamers	Made to order sizing	
Slot Cutters	Made to order sizing	
279 Ball Nosed End Mills	1/8" - 3/4"	3.0 - 16.0 mm

Tapered Pin A-2 Sight Post Reamers

180 Series *Slide Finishing End Mill*

Designed specifically to machine Titanium, Inconel, and similar materials.

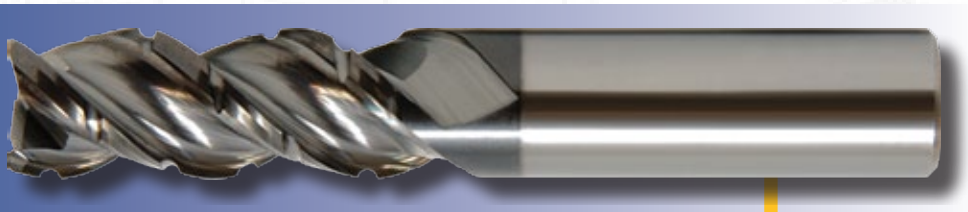
For full offering see pages 205-209.



380 Series *9 Flute Finishing End Mill*

For full offering see page 183.

Uneven number of flutes reduces harmonics to provide stable machining zones.



334 Series *Magazine Well Rougher*

Chipbreaker design provides better part finish than a traditional knuckle rougher.

For full offering see page 234.

Rail Profile Cutter

Chamber Reamers

Made to order from 22 LR to 50 BMG.
Piloted & Non-piloted options available.

Slot Cutters

Used for cutting notches and key ways.

279 Series
Ball Nose End Mill

For radius grooves and cylinder fluting.

For full offering see pages 204.

BLUESWARF DASHBOARDS™

Stop Guessing. Start Knowing.

The BlueSwarf Dashboard™ is a revolutionary new product that dramatically improves the performance of milling using the science of machining dynamics. Dashboards™ control the dynamic frequencies and vibrations that limit milling operations and generate chatter.

EXPERT ANALYSIS - BlueSwarf Dashboards™ are a system of patented and proven services that begin with onsite measurements of your milling tools by M.A. Ford® and analysis by our staff of Ph.D.-level engineers. Interactive Dashboards™ are delivered for first time right and fully optimized machining.

- Eliminate Chatter.
- Increase Metal Removal Rates.
- Increase Tool Life.
- Improve surface finishes.
- Faster Set-Ups.
- Reduce Energy Consumption.

Fully interactive BlueSwarf Dashboards™ allow users, without extensive knowledge of chatter theory or mechanical vibrations, to take full advantage of the available improvements in process efficiency. BlueSwarf Dashboards™ allow process planners and programmers to select high-efficiency milling parameters for maximized material removal rates in a science-based pre-process manner, rather than relying on trial and error testing.

For more information on BlueSwarf Harmonics Analysis contact your local M.A. Ford® Representative.

M.A. Ford® is an Authorized and Certified BlueSwarf Service Provider.

Made in USA

ISO 9001:2015 Certified

CERAedge®

Ceramic Coating with Extreme Properties

- Hardness that makes it the 3rd hardest material when compared to industrial diamonds.
- Toughness that is comparable to Titanium.
- Lubricity that approaches Teflon.
- Extreme heat tolerance.
- Non-reactive to Titanium.

Coating Properties

M.A. Ford® Coating	Microhardness (HV)	Maximum Service Temp.	Friction Coefficient	Coating Thickness	Color
CERAedge®	3400	1100° C / 2012° F	.25	2-3 Microns	Light Gray

CERAedge® Applications

Titanium-clad composite material:

Hardness and lubricity ideal for composites
Toughness that allows excellent machining of Titanium
CERAedge® is perfect for machining of
Titanium-clad composites!

See Standard Offering of these Products with CERAedge® coating		See Page
138CE	Series End Mills	246
207CE	Brad and Spur Point Drill	81

Aluminum and high silicon aluminum materials:

Hardness and lubricity extend tool life by increasing wear and resistance.

Test Data

Material Machined: 6061 Aluminum Extrusion
M.A. Ford® Tool: 138 Series, 3 Flute End Mill, 1/2" (12.7 mm) OD
RPM: 22,000 RPM
IPM: 300 (7,620 mm/minute)

	Competitor's Lubricious Coating	M.A. Ford® CERAedge® Coated
Parts Produced/Tool	5	42
Linear Inches/Tool (Linear m/tool)	10,690 (272)	92,976 (2,360)

M.A. FORD®
High Performance Cutting Tools

See something you would like to try?

Complete this form to request your FREE tool!*

Company Information:	
Company Name:	End User:
Requested By:	Contact Name:
Address:	Ship to Address:
City, State, Zip:	City, State, Zip:
Phone:	Phone: Ship Via:
Fax:	Fax:
e-mail Address:	e-mail Address:

M.A. Ford® Sales Rep.: _____

M.A. Ford® Trial Tool Requested:

Qty/Tool # _____ Qty/Tool # _____

Comments: _____

_____

_____

Additional Information:			
Application Description:			
Machine Type	Horizontal ☐	Vertical ☐	Other ☐
RPM		Horsepower	
Condition	Good ☐	Fair ☐	Poor ☐
Material:		Hardness	
Coolant?	Yes ☐	No ☐	Type

Current Tooling Appraisal:	
Current Tool:	
Mfg.	Part #
Feed Rate:	
RPM:	
Width/Depth of Cut:	
Hole Depth:	
No. Holes Produced:	
No. Parts Produced:	
Production Rate:	

*All requests subject to approval. An M.A. Ford® representative will contact you to discuss your application.

Please send this form to M.A. Ford® 7737 Northwest Blvd. Davenport, IA 52806 or
Fax to: 800-892-9522 / 563-386-7660.
Form available on line at www.maford.com

Material Conversion Chart

	USA	France	Brazil	German W-nr	German DIN	UK	Spain	Japan JIS
FREE MACHINING STEEL	12L13	S250Pb		1.0718	9SMnPB28		F.2112 -	
	1108	10F1		1.0721	10S20	210M15	F.2121 -	
	11L08	10PbF2		1.0722	10SPb20		F.2122 -	
				1.0723	15S20	210A15	F.210F.	
	1215	S300	1215	1.0736	9SMn36	240M07 EN 1B	F.2113-	
	12L14	S300Pb		1.0737	9MnPb36		F.2114 -	
LOW CARBON STEEL	1010	AF34C10/XC10	1010	1.0301	C10	045M10		
	1015	AF37C12/XC18	1015	1.0401	C15	080M15;040A15	F.111	
	1020	AF42C20/XC25	1020	1.0402	C22	055M15 EN2C	F.112	
	1025	AF50C30		1.0406	C25	070M26	F.221	
	1212			1.0711	9S20	220M07		
	1213	S250	1213	1.0715	9SMn28	230M07	F.2111 -	
	1010	XC10	1010	1.1121	Ck10	040A10	F.1510 -	
	1022/1518	20M5		1.1133	20Mn5	120M19	F.1515 -	
	1015	XC15 / C15E	1015	1.1141	Ck15	080M15 EN 32C	F.1511 -	
	10201023	XC25 / C22E	1020	1.1151	Ck22	050A20	F.1120 -	
	1025	XC25 / C25E		1.1158	Ck25	070M26	F.1120 -	
	A350-LF5	15N6 / 15Ni6		1.5622	14Ni6		F.2641 -	
	3310/9314	12NC15		1.5752	14NiCr14	655M13/A12 EN 36A		
MEDIUM CARBON STEEL	1035	AF55C35 /XC38	1035	1.0501	C35	060A35	F.113	
	1045	AF65C45 /C45	1045	1.0503	C45	080M46	F.114	
	1040	AF60C40 C40	1040	1.0511	C40		F.114.A	
	1055	C55	1055	1.0535	C55	070M55		
	1060	AF70C55 / C60	1060	1.0601	C60	080A62 EN 43D	F.115	
	1140	35MF6	1140	1.0726	35S20	212M36 EN 8M	F.210G.	
	1146	45MF4		1.0727	45S20	212M44		
	9255	51S7		1.0903	51Si7	250A53 EN 45	F.1450 -	
	9255	55S7	9254	1.0904	55Si7		F.1440-	
	9260	60S7		1.0909	60Si7	250A58	F.1441 -	
	9262	60SC7		1.0961	60SiCr7	250A61	F.1442 -	
	1330/1536	35M5 / 30Mn5		1.1165/66	30Mn5/34Mn5	120M36/150M28	F.1203	
	1335	40M5 / 36Mn5	1541	1.1167	36Mn5	150M36 EN 15	F.1203 -	
	1330	20M5 / 28Mn6	1330	1.117	28Mn6	150M28 EN 14A		
	1035	XC32 / C35R	1035	1.118	Cm35	080M36	F.1135 -	
	1040	XC42H1 / C40E	1040	1.1186	Ck40	060A40/080A40		S 40 C
	1045	XC42H1 / C45/XC45	1045	1.1191	Ck45	080M46/060A47	F.1140 -	S 45 C
	1045	XC42H1 /C45R	1045	1.1201	Cm45	080M46	F.1145 -	
	1055	XC55H1 / C55E	1055	1.1203	Ck55	060A57/070M55	F.1150 -	S55C
	1050	XC48H1 / C50E	1050	1.1206	Ck50	080M50		
	1050	XC48H1TS	1050	1.1213	Cf53	060A52		
	1060	XC60 / C60E/2C60	1060	1.1221	Ck60	060A62	F.511/F.512	S58C
	1070	XC68	1070	1.1231	Ck67	060A67		
ALLOY STEEL	1080/1078/1086	XC75 / C75E/XC90	1074	1.1248/1269	Ck75	060A78	F.513/514/515	
	1095	XC100	1095	1.1274	Ck101	060A96		
	4135/4142	34CD4 /42CD4		1.233	35CrMo4/47CrMo4	708A37/M40		SCM435TK
	3135/3140	35NC6		1.571/.5711	36NiCr6/40NiCr6	640A35/M40 EN111A		
	8620/8720	20NCD2	8620	1.6523/43	21NiCrMo2	805M20/A20 EN 362	F.1522 -	SNCM220(H)
	8740	40NCD2	8640	1.6546	40NiCrMo22	311-Type7	F.1204 -	SNCM240
		18NCD6		1.6587	17CrNiMo8	820A16	F.1560 -	
	5132	32C4 / 34Cr4		1.7033	34Cr4	530A32 EN18B	F.8221 /F.224	SCR430(H)
	5135	38C4 / 37Cr4	5135	1.7034	37Cr4	530A36	F.1201 -	
	5140	42C4 / 41Cr4	5140	1.7035	41Cr4	530M40/A40 EN 18	F.1202 -	SCR440(H)
	5140	42C4TS	5140	1.7045	42Cr4	530A40	F.1202 -	SCR440
	5115	16MC5	5115	1.7131	16MnCr5	527M17	F.1515 -	
	5155	55C3		1.7176	55Cr3	527A60 EN 48	F.1431 -	SUP9(A)
	4130	25CD4 / 25CrMo4	4130	1.7218	25CrMo4	1717CDS110	F.8330 -	SCM420/430
	4135/4137	35CD4 / 34CrMo4		1.722	34CrMo4	708A37 EN 19B	F.8231 -	
	4140/4142	42CD4 / 42CrMo4	4140	1.7225	42CrMo4	708M40 EN 19A	F.8232 -	
	4150	50CrMo4	4150	1.7228	50CrMo4	708A47		
	6150	50CV4 / 51CrV4	6151	1.8159	50CrV4	735A50 EN 47	F.1430 -	

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

Material Conversion Chart

	USA	France	Brazil	German W-nr	German DIN	UK	Spain	Japan JIS
HIGH STRENGTH ALLOY STEEL	A355Cl.D	30CAD6.12		1.8507	34CrAlMo5	905M31	F.1741 -	
	A355Cl.A	40CAD6.12		1.8509	41CrAlMo7	905M39 EN 41B	F.1740 -	
		18NC13		1.5755	31NiCr14	653M31	F.123	
	9840	40NCD3		1.6511	36CrNiMo4	816M40 EN 110	F.1280	
	4340		4340	1.6562	40NiCrMo73	817M40		SNCM 447
		30CND8		1.658	30CrNiMo8	823M30		
	4340	35NCD6	4340	1.6582	34CrNiMo8	817M40 EN 24	F.1272	SNCM 447
		35NCD14		1.6746	32NiCrMo145	830M31	F.1262	
		35NCD16		1.6747	30NiCrMo166	835M30	F.1260	
		30CD12		1.8515	31CrMoV139	722M24 EN 40B	F.1712	
				1.8523	39CrMoV139	897M39 EN 40C		
STRUCTURAL STEEL	A570 (36)	E24-2NE / S235JRG2	A36	1.0038	RSt37-2	4360-40C		STKM 12A
	A570 (40)	E28-2 / S275JR		1.0044	St44-2	4360-43A/B	A 430B	SM 400 A;B;C
	A570 (50)	A50-2 / E295		1.005	St50-2	4360-50B		SS490
		A60-2 / E335-A70-2/E360		1.006/.007	St60-2/St70-2	4360-55E		
	A284/A573/A611	E24-3;-4 / S235J2G3		1.0116	St37-3	4360-40C/D-1449-37C	A360 C;D	
	A366/1012/A619	DC01		1.033/.0333	St12/13	1449 -2/3/4CR	AP 00/02	
	A620	DC04		1.0338	St14	1449 1CR; 2CR	AP 04	
	A516Gr.65;-55;	A37CP;AP / P235GH		1.0345	H I	1501Gr.161-360/400	A 37 RC I;RA II	
		A42CP;AP / P265GH		1.0425	H II	161-400;	A42 RC I	
	A537	A52CP;AP / P335GH		1.0473	19Mn6		A 47 RB II	
	A516 (70)	A48CP;AP / P295GH		1.0481	17Mn4		A 47 RC I; RA II	
		E36-3/4 / S355J2G3		1.057	St52-3	4360-50B;50C;50D	A 510 C;D	
	A204 (A)	15D3 / 15Mo3		1.5415	15Mo3	1501-240	F.2601 -	
	4520			1.5423	16Mo5	1503-245-420	F.2602 -	
	A350-LF3	12N14 / 12Ni14		1.5637	10Ni14	1501-503-690	F.152	
	3115	10NC6		1.5713	13NiCr6			
	3415	14NC11		1.5732	14NiCr10		F.1540	
	A182-F11;F12	15CD3.05		1.7335	13CrMo44	620Gr.27;31	F.2631	
	A387 (12)	15CD4.5		1.7337	16CrMo44	620Gr.27		
	A182F22	10CrMo9-10		1.738	10CrMo910	622Gr.31;45	TU.H	
	A633Gr.E	E420RIFP / S420N		1.8902	StE420	4360-55E	AE 420 KG	
	A633Gr.E	E460RIFP / S460N		1.8905	StE460		AE 460 KG	
HIGH TEMPERATURE ALLOYS	330	Z12NCS37.18		1.4864	X12NiCrSi3616	NA17	F.3313	
				1.4865	G-X40NiCrSi3818	330C40		
	B163	Z8NC3221		1.4876	X10NiCrAlTi3320	NA15(H)	F.3545	
	4544/SB127/164	NU30		2.436	NiCu30Fe	3072-76/NA13		
	4676			2.4375	NiCu30Al	3072-76/NA18/3146		
	5388 C	NC 17 DWY		2.4602	NiCr17Mo17FeW			
		NC 20 T		2.463	Ni-Cr20Ti	HR5/203-4/703-B		
		NC 20 TA		2.4631	NiCr20TiAl	HR 401HR601/736B		
		NCKD 20 ATV		2.4634	NiCo20Cr15MoAlTi	HR 3/5007		
	687	NCKD 20 AT		2.4636	NiCo15Cr15MoAlTi			
		NCK 20 D		2.465	NiCr20Co19MoTi	HR 10		
	5660C	Z8 NCDT 42		2.4662	NiCr15MoTi			
	5536E	Nc 22 FeD		2.4665	NiCr22Fe18Mo	HR 6/204		
		NC 19 FeNb		2.4668	NiCr19Fe19NbMo	HR 8		
	5542G	NC 15 Fe TNb		2.4669	NiCr16FeTi	HR 505		
	5391A	NC 13 AD		2.467	G-NiCr13Al6MoNb	HC 203		
		NK 15 CAT		2.4674	NiCo15Cr10MoAlTi	HC 204		
	5540	NC 15 Fe		2.4816	NiCr15Fe	3072-76		
	5581	NC 22 FeDNB		2.4856	NiCr22Mo9Nb			
		NC 21 FeDU		2.4858	NiCr21Mo	3072-76		
		NC 19 KDT		2.4973	NiCr19Co11MoTi			
	684	NCK 19 DAT		2.4983	NiCr18Co18MoAlTi			
TITANIUM TITANIUM ALLOYS		T-35		3.7024/25	Ti 99,8	TA.1	Ti-PO1	
		T-U2		3.7124	TiCu2	TA.21-24/52-55/58	Ti-P11	
		T-A6ZD		3.7154	TiAl6Zr5Mo0,5Si0,2	TA.43/44	Ti-P67	
		T-A4DE		3.7184	TiAl4Mo4Sn2Si0,5	TA.45-51/57	Ti-P68	
	4941/42/51/4902	T-40		3.7034/35	Ti 99,7	TA.2/3/4/5	Ti-PO2	
	4901/21	T-60		3.7064/65	Ti99,5	TA.6/7/8/9	Ti-PO4	
	491128/35/54/65/67	T-A6V		3.7164/65	TiAl6V4	TA.10-13/28/56	Ti-P63	
	4900	T-50				DTD 5023/5283		

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

For product information, call your local distributor.

Material Conversion Chart

	USA	France	Brazil	German W-nr	German DIN	UK	Spain	Japan JIS
STAINLESS STEELS	410S	Z3014		1.4001	X7Cr14	403S17	F.8401	
	405	Z6CA13 / Z6CrAl13		1.4002	X6CrAl13	405S17	F.3111	
	416	Z12CF13 / Z12CrS13		1.4005	X12CrS13	416S21	F.3411	SUS 416
	410/CA-15	Z12C13 / Z12Cr13	410	1.4006	X10Cr13	410S21 ENEN 56A	F.3401	SUS 410
	430	Z8C17 / Z6Cr17		1.4016	X6Cr17	430S15 EN 60	F.3113	SUS 430
	420	Z20C13 / Z20Cr13	420	1.4021	X20Cr13	420S37	F.3402	SUS 420
		Z40C14 / Z40Cr14		1.4034	X46Cr13	420S45 EN 56D	F.3405	
	431	Z15CN16.02		1.4057	X20CrNi172	431S29 EN 57	F.3427	
	430F	Z10CF17		1.4104	X12CrMoS17		F.3117	
	434	Z8CD17.01		1.4113	X6CrMo17	434S17		
	440C	Z100CD17		1.4125	X105CrMo17			
	304/304H	Z6CN18.09	304	1.4301	X5CrNi1810	304S15 EN 58E	F.3451	SUS304
	308; 305	Z8CN18.12		1.4303	X5CrNi1812	305S19	F.3513	
	303	Z10CNF18.09	303	1.4305	X10CrNiS189	303S21 EN 58M	F.3508	SUS303
	304L	Z2CN18.10/Z3CN19.10M		1.4306	G-X2CrNi189/1911	304S12/S11/C12	F.3503	SCS19
	CF-8	Z6CN18.10M		1.4308	G-X6CrNi189	304C15		
	301	Z12CN17.07	302	1.431	X12CrNi177	301S21	F.3517	
	304LN	Z2CN18.10Az		1.4311	X2CrNiN1810	304S62		
		Z10CN18.9M		1.4312	G-X10CrNi188	302C25		
	CA6-NM	Z4CND13.4M		1.4313	G-X5CrNi134	425C11		
	316/316L	Z6CND17.11	316	1.4401	X5CrNiMo17122	316S16/S31 EN 58J	F.3543	SUS316
	316L	Z2CND 18.13	316L	1.4404	X2CrNiMo17132	316S11/S12	F.3533	SUS316 L
	316LN	Z2CND 17.12Az		1.4406	2CrNiMoN17122	316S61		SUS316LN
	CF-8M			1.4408	G-X6CrNiMo1810	316C16	F.8414	
	316LN	Z2CND17.13Az		1.4429	X2CrNiMo17133	316S62		SUS316LN
	316L	Z2CND17.13		1.4435	X2CrNiMo18143	316S11/S12	F.3533	SUS316LN
	316	Z6CND17.12		1.4436	X5CrNiMo17133	316S16	F.3534	SUS316
	317L	Z2CND19.15		1.4438	X2CrNiMo18164	317S12		SUS317L
	329		329 (DUPLEX)	1.446	X8CrNiMo275		F.3309	SUS329
	XM8/430Ti	Z8CT17		1.451	X6CrTi17		F.3114	
	409	Z6CT12		1.4512	X5CrTi12	409S19		
	321	Z6CNT18.10	321	1.4541	X6CrNiTi1810	321S12/S31 EN 58B	F.3523	SUS321
	630	Z6CNU17.04		1.4542	X5CrNiCuNb1714			SUS630
	347	Z6CNNb18.10		1.455	X6CrNiNb1810	347S17/S31 EN 58F	F.3552	SUS347
	316Ti	Z6CNDT17.12		1.4571	X6CrNiMoTi17122	320S31/S17 EN 58J	F.3552	
	316Ti			1.4573	X10CrNiMoTi1812	320S33		
	316Cb	Z6CNDNb17.12/19.13		1.458	X6CrNiMoNb17122	318S17		
	HNV3	Z45CS9		1.4718	X45CrSi93	401S45 EN52	F.3220	
		Z10C13		1.4724	X10CrAl13	403S17	F.13152	
		Z40CSD10		1.4731	X40CrSiMo102		F.3221	
	430	Z10CAS18		1.4742	X10CrAl18	430S15	F.3153	SUS430
	HNV6	Z80CSN20.02		1.4747	X80CrNiSi20	443S65 EN 59	F.3222	
	446	Z10CAS24		1.4762	X10CrAl24		F.3154	SUH446
	309	Z15CNS20.12		1.4828	X15CrNiSi2012	309S24		
	309S	Z15CN24.13		1.4833	X7CrNi2314	309S24		
	314/310	Z15CNS25.20	314	1.4841	X15CrNiSi2520		F.3310	
	310S	Z12CN25.20	310	1.4845	X12CrNi2521	310S24	F.331	
	HK			1.4848	G-X40CrNiSi2520	310C40	F.8452	
	EV8	Z52CMN21.09		1.4871	X53CrMnNiN219	349S54	F.3217	
		Z35CNWS14.14		1.4873	X45CrNiW189	331S40	F.3211	
	321	T6CNT18.12(B)		1.4878	X12CrNiTi189	321S20	F.3523	SUS321
	A353	Z8N9		1.5662	X8Ni9	1501-509;510	F.2645	
	2515	Z18N5		1.568	12Ni19			

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Material Conversion Chart

	USA	France	Brazil	German W-nr	German DIN	UK	Spain	Japan JIS
TOOL STEELS	A532IBNiCr-LC			0.962	G-X260NiCr42	Grade2A		
	A532IANiCr-HC			0.9625	G-X330NiCr42	Grade2B		
	A532IDNi-HiCr			0.963	G-X300CrNiSi952	Grade2C;D;E		
	A532IID20%CrMo-LC			0.9645	G-X260CrMoNi2021	Grade3C		
	A532IIIA25%Cr			0.965	G-X260Cr27	Grade3D		
	A532IIIA25%Cr			0.9655	G-X300CrMo271	Grade3E		
	W108	Y190;Y180		1.1525	C80W1			
	W110	Y1105		1.1545	C105W1			SK3
	W112	Y2120		1.1663	C125W		F.5123	
	W1			1.175/.1625	C75W/C80W1	BW1A/BW1B	F.1507	
	L3	Y100C6	52100	1.2067	100Cr6	BL3	F.5230	
	D3	Z200C12	420 (1.2083)	1.208	X210Cr12	BD3	F.5212	
	L2			1.221	115CrV3			
	H11	Z38CDV5	H11	1.2343	X38CrMoV51	BH11	F.5317	
	H13	Z40CDV5	H13	1.2344	X40CrMoV51	BH13	F.5318	SKD61
	A2	Z100CDV5	A2	1.2363	X100CrMoV51	BA2	F.5227	SKD12
	H10	32DCV28	H10	1.2365	X32CrMoV33	BH10	F.5313	
	D2	Z160CDV12	D2	1.2379	X155CrVMo121	BD2		
		105WC13		1.2419	105WCr6		F.5233	
			D6 (VC131)	1.2436	X210CrW12		F.5213	
	O1		O1 (VND)	1.251	100MnCrW4	BO1	F.5220	SKS 31
	S1		S1 (VW3)	1.2542	45WCrV7	BS1	F.5241	
		55WC20		1.255	60WCrV7			
	H21	Z30WCV9	H20/H21	1.2581	X30WCrV93	BH21	F.5323	SKD5
				1.2601	X165CrMoV12		F.5211	
	H12	Z35CWDV5	H12	1.2606	X37CrMoW51	BH12		
	L6	55NCDV7	(VMO)	1.2713	55NiCrMoV6		F.528	
	W210	Y1105V		1.2833	100V1	BW2		
	2	90MV8		1.2842	90MnCrV8	BO2		
	T15			1.3202	S12-1-4-5	BT15	F.5563	
		Z130WKCDV10-10-04-03		1.3207	S10-4-3-10		F.553	
		Z85WDKCV06-05-05-04-02	M35	1.3243	S6-5-2-5		F.5613	
	M41	Z110WKCDV07-05-04-04-02		1.3246	S7-4-2-5		F.5613	
	M42	Z110DKCWV09-08-04-02-01	M42	1.3247	S2-10-1-8	BT42	F.5615	
	M33/M34			1.3249	S2-9-2-8	BM34	F.5611	
	T4	Z80WKCV18-05-04-01		1.3255	S18-1-2-5	BT4	F.5530	
	T5			1.3265	S18-1-2-10	BT5	F.5540	
	M3	Z90WDCV06-05-04-03		1.3342	SC6-5-2			
	M2	Z85WDCV06-05-04-02	M2	1.3343	S6-5-2	BM2	F.5603	
	M3Class2	Z130WDCV06-05-04-04	M3:2	1.3344	S6-5-3		F.5605	
	H41/M1	Z85DCWV08-04-02-01		1.3346	S2-9-1	BM1		
	M7	Z100DCWV09-04-02-02	M7	1.3348	S2-9-2		F.5607	
	T1	Z80WCV18-04-01		1.3355	S18-0-1	BT1	F.5520	
	A128(A)	Z120M12 / Z120Mn12		1.3401	X120Mn12		F.82551	
	52100	100C6	52100	1.3505	100Cr6	534A99	F.1310	
HARDENED STEEL								
CAST ALUMINIUM	319,2	A-S5U		3.2151	G-AlSi6Cu4	LM4/LM22	L-2660	
	380,1	A-S9U3		3.2161	G-AlSi8Cu3	LM24	L-2630	
		A-S4G		3.2341	G-AlSi5Mg	DTD716B		
	A356.2	A-S7G0,3		3.2371	G-AlSi7Mg	2L99/LM25		
		A7-S10G		3.2373	G-AlSi9Mg			
	A360	A-S10G		3.2381	G-AlSi10Mg	LM9	L-2560	
	413,1	A-S12U		3.2583	G-AlSi12Cu	LM20	L-2530	
	514.1	A-G6		3.3561	G-AlMg5	LM5		
	A413	A-S13		3.3581	G-AlSi12	LM6	L-2520	
	520	A-G10-Y4		3.3591	G-AlMg10	LM10	L-2310	
	390				AlSi17Cu4			
	393				AlSi18-25CuNiMg	LM28/LM29		

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Material Conversion Chart

	USA	France	Brazil	German W-nr	German DIN	UK	Spain	Japan JIS
WROUGHT ALUMINIUM	1200	A4		3.0205	Al99	1C	L-3001	
	1050A	A5		3.0255	Al99,5	1B	L-3051	
	1350A	A5/L		3.0257	E-Al	1E	L-3052	
	1080A	A8		3.0285	Al99,8	1A	L-3081	
	1199	A99		3.0385	Al99,98R	1		
	3004	A-M1G		3.0526	AlMnMg1	N4	L-3820	
	2014	A-U4SG		3.1255	AlCuSiMn	H15	L-3130	
	2117	A-U2G		3.1305	AlCu2,5Mg0,5	3L86/HR13	L-3180	
	2017A	A-U4G		3.1325	AlCuMg1	H14	L-3120	
	2024	A-U4G1		3.1355	AlCuMg2	2L98	L3140	
	2003	A-U4Pb		3.1645	AlCuMgPb		L-3121	
	2011	A-U5PbBi		3.1655	AlCuBiPb	FC1	L-3182	
	6101B			3.2305	E-AlMgSi	91E	L-3431	
	6463	A85-GS		3.2307	Al99,85MGsI	BTR6		
	6181	A-SGMO,7		3.2315	Al-Si1 Mg	H30	L-3451	
	6060			3.3206	AlMGSi0,5	H9	L-3441	
	6101C	A-GS/L		3.3207	E-AlMgSi0,5	BTRE6		
	5005A	A-G0,6		3.3315	AlMg1	N41	L-3350	
	5050B	A-G1,5		3.3316	AlMg1,5	3L44	L-3380	
	5052	A-G2,5C		3.3523	AlMg2,5	N5Mg3,5	L-3360	
	5251	A-G2M		3.3525	AlMg2Mn0,3	N4		
	5754	A-G3M		3.3535	AlMg3		L-3390	
	5454	A-G2,5MC		3.3537	AlMg2,7Mn	N51		
	5083	5083		3.3547	AlMg4,5Mn	N8	L-3321	
	5056A			3.3555	AlMg5	N6	L-3320	
	7020	A-Z5G		3.4335	AlZn4,5Mg1	H17	L-3741	
	7075	A-Z5GU		3.4365	AlZnMgCu1,5	2L95	L-3710	
SG / NODULAR CAST IRON	60-40-18	FGS-400-12		0.704	GGG-40	420/12		
		FGS370-17		0.7043	GGG-40.3	370/17		
	65-45-12	FGS500-7		0.705	GGG-50	500/7		FDC500
	80-55-06	FGS 600-3		0.706	GGG-60	600/3		
	100-70-03	FGS 700-2		0.707	GGG-70	700/2		FDC700
	120-90-02	FGS 800-2		0.708	GGG-80	800/2		
		MB 35-7		0.8035	GTW-35-04	W 340/3		
		MB 40-10		0.804	GTW-40-05	W 410/4		
				0.8045	GTW-45-07			
	32 510	MN 35-10		0.8135	GTS-35-10	B 340/12		
		MP 50-5		0.8145	GTS-45-06	P 440/7		
		MP 60-3		0.8155	GTS-55-04	P 540/5		
				0.8165	GTS 65-02			
	70 003	MP 70-2		0.817	GTS 70-02	P 690/2		
GREY / WHITE CAST IRON	A48-40B	Ft25D / FGL250		0.6025	GG25	Grade 260	FG 25	
	A48-20B	Ft10D / FGL100		0.601	GG10		FG 10	
	A48-25B	Ft15D / FGL150		0.6015	GG15	Grade 150	FG 15	
	A48-30B	Ft20D / FGL200		0.602	GG20	Grade 220	FG20	
	A48-45B	Ft30D / FGL300		0.603	GG30	Grade 300	FG 30	
	A48-50B	Ft35D / FGL350		0.6035	GG35	Grade 350	FG35	
	A48-60B	Ft40D / FGL400		0.604	GG40	Grade 400		
BRONZE ALUMINIUM- BRONZE TIN BRONZE	C 60 800	CuAl6		2.0918	CuAl5As			
	C 61 000	CuAl8		2.092	CuAl8			
	C 61 400	CuAl7Fe2		2.0932	CuAl8Fe3	CA 106		
	C 62 300	CuAl9Fe3Mn2		2.0936	CuAl10Fe3Mn2	CA 105		
	C 95 200	CuAl9Fe3		2.094	CuAl10Fe	AB 1		
	B 505	CuAl9Fe3		2.094	G-FeAlBzF50	AB 1		
		CuAl9Mn2		2.096	CuAl9Mn2			
	C 63 200	CuAl9Ni5Fe3Mn		2.0966	CuAl10Ni5Fe4	CA 104		
	C 95 800	CuAl9Ni5Fe		2.097	G-NiAlBzF50	AB 2		
		CuAl11Ni5Fe5		2.0978	CuA11Ni6Fe5			
	C 94100	CuPb20Sn5		2.1188	G-CuPb20Sn	LB5		

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BRASS	C 21000/34500	CuZn5		2.022/2.032	CuZn5	CZ 125/101		
	C 85700	CuZn40-Y30		2.034	G-CuZn37Pb	PCB 3		
	C 28000/38500	CuZn40/44Pb2		2.036/2.041	CuZn40/44Pb2	CZ 109/CZ130		
	C 68700	CuZn22Al2		2.046	CuZn20Al2	CZ 110		
	C 44300			2.047	CuZn28Sn1	CZ 111		
	C 46400			2.053	CuZn38Sn1	CZ 112		
	C 67400			2.055	CuZn40Al2	CZ 114		
	C 86400			2.0591	G-CuZn38Al	PCB1, DCB 3		
	C 86400	CuZn40-Y30		2.0592	G-CuZn35Al1	HTB 1		
	C 86300			2.0598	G-CuZn25Al5	HTB 3		
	C 90500			2.105	G-CuSn10Zn	G1		
	C 90800	CuSn12		2.1052	G-CuSn12	Pb2		
	C 91700			2.106	G-CuSn12Ni	CT2		
	C 90250			2.1086	G-CuSn10	CT1		
	C 93200	CuSn7Pb6Zn4		2.109	G-CuSn7ZnPb			
	C 92410			2.1093	G-CuSn6ZnNi	LG4		
	C 83600	CuPb5Sn5Zn5		2.1096	G-CuSn5ZnPb/RG5	LG2		
	C 93700	CuPb10Sn10		2.1176	G-CuPb10Sn	LB2		
	C 93800			2.1182	G-CuPb15Sn	LB1		
COPPER COPPER/NICKEL ALLOYS	C 96200			2.0815	G-CuNi10			
	C 71300	CiNi25		2.083	CuNi25	CN 105		
	C 96400			2.0835	G-CuNi30	CN 2		
	C 72150	CuNi44		2.0842	CuNi44Mn1			
	C 70600	CuNi10Fe1Mn		2.0872	CuNi10Fe1Mn	CN 102		
	C 71500	CuNi30Mn1Fe		2.0882	CuNi30Mn1Fe	CN 107		
	C 17000	CuBe1,7		2.1245	CuBe1,7	CB 101		
	C 17200	CuBe1,9		2.1247	CuBe2			
	C 17500			2.1285	CuCo2Be	C 112		
	C 71640	CuNi30Fe2Mn2			CuNi30Fe2Mn2	CN 108		
	OF	Cu-c1/C2		2.004	OF-Cu	Cu-OF C 103/110		
	C 11000	Cu-a1/A2		2.006	E-Cu57	Cu-ETP-2 C 101		
	C 11000	Cu-a1		2.0065	E-Cu58	Cu-ETP-2 C 101		
	C 1200	Cu-b2		2.0076	SW-Cu			
	C 12200	Cu-b1		2.009	SF-Cu	Cu-DHP C 106		

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Notes

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