3M Science. Applied to Life.™

3M™ Superabrasive Wheels for Cutting Tools

Tough tools for your toughest jobs.

September 2015 Edition

The products featured in this catalog are 3M's best "go-to" wheels for cutting tool applications ranging from short runs and re-sharpening to "lights-out" and long production runs. All are instock and are available for fast, two-day shipping within the U.S. **If you require an item that is not listed, please contact your 3M Customer Service Representative at 1-800-736-2500.**

2-Day shipping on stock wheels within the U.S.

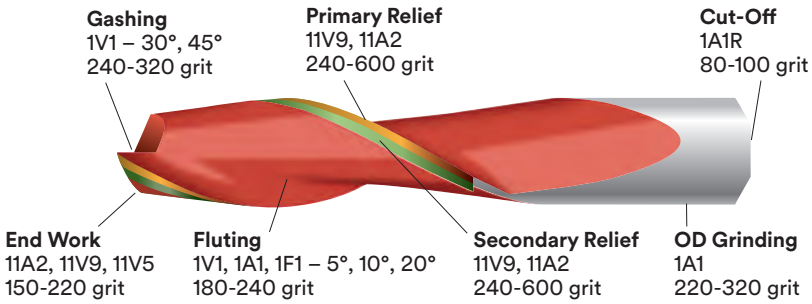
Table of Contents

Glossary

The following is a brief description of terms for the most common round tool grinding applications:

Gashing	Grinding a slot or notch along the cutting face to allow for chip flow.
Fluting	Flutes are the helical or straight grooves in the body of the tool. This provides a pathway to permit the removal of chips, and to allow coolants to reach the cutting surface.
Primary Relief	Removing material directly behind the cutting edge to provide clearance.
Secondary Relief	A slight bevel next to the primary relief.
OD Grinding	Grinding to final diameter.
End Work	Grinding a small clearance, or relief angle on the face (tip) of the tool.
Cut-Off	Using a thin wheel to trim blanks to length. Typically used on the cutting end of the tool when re-grinding and on the shank end when forming a blank.

Typical Abrasive Wheels Used for Round Tool Grinding



When to use Diamond vs. CBN

Diamond	CBN
• Carbide	• Tool steel
• Non-ferrous metals	• High speed steel
• PCD	
• Cermets	
• Polycrystalline CBN/Diamond (PCBN)	

Round tools can be made out of any of these materials. For optimal grinding results, make sure you know what material the tools are made of.

Tips for Optimizing Your Grinding Process

1. Match the Wheels to Your Production/Process

Consider using dedicated wheels vs. one wheel for all applications.

	Length of Production Run		
	Long (Untended)	Medium	Short Runs & Specials
Optimal Wheel Properties	Form holding	Form holding Fast cutting	Fast cutting

2. Match Wheel Size (OD) to the Equipment Capabilities

Diamond Wheels
Smaller diameter wheels can be run at higher RPM to achieve the recommended surface speed (sfpm or mps). This helps utilize more of the available horsepower. With enough HP, you can process faster, without stalling the machine.

CBN Wheels
- The higher the sfpm, the better the grinding performance
- Larger diameters help achieve higher sfpm
- CBN wheel should be run over 8,500 sfpm
- CBN wheels provide higher stock removal at higher surface speeds

3. Diamond Wheels

Slower diamond grinding wheel speeds (sfpm) = faster feeds
The slower surface speed of the grinding wheel means you can increase the feed rate. The wheel acts softer, which produces higher cutting action. This is only true for diamond on carbide.

Diamond Wheel Operating Speeds

Fluting (Hybrid, Resin and Poly Bonds)	Gashing* (Poly or Resin Bonds)	OD & End Work (Poly or Resin Bonds)
2,200 to 3,400 sfpm (11 to 17 mps)	4,500 to 6,500 sfpm (22 to 32 mps)	4,500 to 5,500 sfpm (22 to 28 mps)

*Gashing wheels provide better form retention but less stock removal. Should be run at higher rpm so the wheel will act harder.

4. CBN Wheels

With CBN wheels, faster is better
- For improved performance, operating speed should be 8,500 sfpm (44 mps) or more
- Maximum sfpm to be determined (dependent on machine capability)
- Special speed testing to guard against rotational failure is required over 10,000 sfpm

5. Grinder Considerations

Does it have enough power?
Grinder must be powerful enough to maintain spindle speed at the highest required grinding load.

Is it sufficiently rigid?
- Machine must be rigid; less than .0002" deflection under side load
- Machine must be able to handle the expected tolerance of the tool
- Bearings must be in good condition

6. Coolant Delivery System

- Coolant speed and pressure are just as important as coolant flow (100 psi is a good place to start)
- Position coolant nozzle to flow between the grinding wheel and the part being ground right at the point of contact
- Clean coolant is critical — contamination causes coolant to break down and affects part finish
- Maintain constant and consistent coolant temperature. Variation of more than ± 5°F causes excessive variation in the tolerance of the tools.
- Over-design the system where possible to optimize the flow, volume and speed of clean coolant to the grinding zone
- Dry grinding is not recommended

7. Troubleshooting

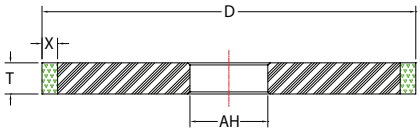
Problems	Potential Causes	Remedies
Loading of superabrasive wheel (frequent dressing cycles)	Poor dressing	Re-dress and follow dressing recommendations.
	Poor filtration, insufficient coolant	Follow coolant recommendations.
	High speed on superabrasive grinding wheel	Slow down wheel speed.
	Feeds too light	Increase removal rate.
	Grinding wheel is too hard	Change to a softer wheel.
Excessive wear of superabrasive wheel	Insufficient coolant at the grinding interface	Improve volume, pressure, nozzle design and placement.
	Low wheel speed	Increase wheel speed so it will act harder.
	Excessive feed rate	Reduce depth of cut.
	Grinding wheel is too soft	Change to a harder or thicker wheel. Increase wheel speed so it will act harder.
Excessive heat or burned workpiece	Insufficient coolant at the grinding interface	Improve volume, pressure, nozzle design and placement.
	Grinding wheel speed too fast	Decrease wheel speed.
	Excessive feed rate	Reduce depth of cut.
	Grinding wheel is too hard	Change to a softer wheel.
	Insufficient or misdirected coolant	Follow coolant recommendations.
Poor workpiece surface finish	Balance, run-out, vibration	Check spindle bearings or other machine components. Check balance and trueness of wheel.
	Grinding wheel is too coarse	Change to a finer grit wheel.
	Wheel face is loaded or glazed	Condition wheel with dressing stick.
	Poor filtration, insufficient coolant	Follow coolant recommendations.
	Grinding wheel is too soft	Change to a harder or thicker wheel. Increase wheel speed so it will act harder.

3M™ Fluting Wheels

Flutes are the helical or straight grooves in the body of the tool. This provides a pathway to permit the removal of chips, and to allow coolants to reach the cutting surface.

The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. **These wheels are recommended for wet applications.** For dry applications or wheel configurations/grades not listed here, please contact your 3M Customer Service Representative at 1-800-736-2500.

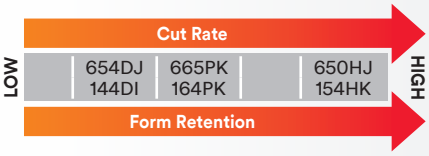
Shape – 1A1



Dimensions D × T × AH* (inches)	Abrasive	Grade	Bond	Prod ID	UPC (051141-)
4 × 1/4 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31270-5
			Polyimide	665PK	54806-7
			Resin	654DJ	31288-0
4 × 3/8 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31273-6
			Polyimide	665PK	54809-8
			Resin	654DJ	31291-0
4 × 1/2 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31267-5
			Polyimide	665PK	54803-6
			Resin	654DJ	31285-9
	CBN	B180	Hybrid	154HK	55465-5
			Polyimide	164PK	55466-2
			Resin	144DI	55467-9
5 × 1/4 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31279-8
			Polyimide	665PK	54823-4
			Resin	654DJ	31297-2
5 × 3/8 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31282-8
			Polyimide	665PK	54828-9
			Resin	654DJ	54800-5
5 × 1/2 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	31276-7
			Polyimide	665PK	54820-3
			Resin	654DJ	31294-1
	CBN	B180	Hybrid	154HK	55468-6
			Polyimide	164PK	55469-3
			Resin	144DI	55470-9
5 × 3/4 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	54916-3
			Polyimide	665PK	54917-0
			Resin	654DJ	54918-7
6 × 1/2 × AH X = 3/8	Diamond	D220	Hybrid	650HJ	55462-4
			Polyimide	655PK	55464-8
			Resin	654DJ	55463-1
	CBN	B180	Hybrid	154HK	55471-6
			Polyimide	164PK	55472-3
			Resin	144DI	55473-0

*Arbor hole is made to customer spec. Please specify on order.

Fluting Wheel Performance Characteristics
3M has six standard constructions that are ideal for a variety different operations.



654DJ/144DI
- Phenolic resin bond
- Good cut rate/stock removal
- Holds shape
- Use for lower temperature operations
- Can be run with water
- Ideal for small re-grind shops or in-house re-sharpening

665PK/64PK
- Polyimide resin bond
- Higher cut rate/fast stock removal
- Better form retention
- Designed for higher temperature operations

650HJ/154HK
- Hybrid bond
- Fastest cut rate
- Best form retention
- Designed for higher temperature operations than polyimide bond
- Reduced frequency of dressing and minimal “white sticking” required
- Ideal for long, uninterrupted runs

3M™ Fluting Wheels

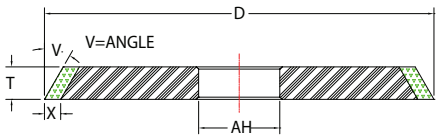
The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. **These wheels are recommended for wet applications.** For dry applications or wheel configurations/grades not listed here, please contact your 3M Customer Service Representative at 1-800-736-2500.

Dimensions D × T × AH* (inches)	Abrasive	Grade	Bond	Prod ID	UPC (051141-)
4 × 1/4 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31268-2
			Polyimide	665PK	54804-3
			Resin	654DJ	31286-6
4 × 1/4 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31269-9
			Polyimide	665PK	54805-0
			Resin	654DJ	31287-3
4 × 3/8 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31271-2
			Polyimide	665PK	54807-4
			Resin	654DJ	31289-7
4 × 3/8 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31272-9
			Polyimide	665PK	54808-1
			Resin	654DJ	31290-3
4 × 1/2 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31265-1
			Polyimide	665PK	54801-2
			Resin	654DJ	31283-5
4 × 1/2 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31266-8
			Polyimide	665PK	54802-9
			Resin	654DJ	31284-2
4 × 1/2 × AH X = 3/8 V = 0°–20°**	CBN	B180	Hybrid	154HK	55474-7
			Polyimide	164PK	55475-4
			Resin	144DI	55476-1
5 × 1/4 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31277-4
			Polyimide	665PK	54821-0
			Resin	654DJ	31295-8
5 × 1/4 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31278-1
			Polyimide	665PK	54822-7
			Resin	654DJ	31296-5
5 × 3/8 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31280-4
			Polyimide	665PK	54826-5
			Resin	654DJ	31298-9
5 × 3/8 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31281-1
			Polyimide	665PK	54827-2
			Resin	654DJ	31299-6
5 × 1/2 × AH X = 3/8 V = 10°	Diamond	D220	Hybrid	650HJ	31274-3
			Polyimide	665PK	54818-0
			Resin	654DJ	31292-7
5 × 1/2 × AH X = 3/8 V = 20°	Diamond	D220	Hybrid	650HJ	31275-0
			Polyimide	665PK	54819-7
			Resin	654DJ	31293-4
5 × 1/2 × AH X = 3/8 V = 0°–20°**	CBN	B180	Hybrid	154HK	55477-8
			Polyimide	164PK	55478-5
			Resin	144DI	55479-2
5 × 3/4 × AH X = 3/8 V =10°	Diamond	D220	Hybrid	650HJ	54919-4
			Polyimide	665PK	54920-0
			Resin	654DJ	54921-7
6 × 1/2 × AH X = 3/8 V = 0°–20° **	CBN	B180	Hybrid	154HK	55480-8
			Polyimide	164PK	55481-5
			Resin	144DI	55482-2

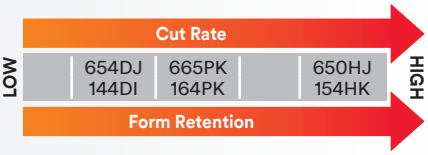
*Arbor hole is made to customer spec. Please specify on order.
**Please specify angle.

Flutes are the helical or straight grooves in the body of the tool. This provides a pathway to permit the removal of chips, and to allow coolants to reach the cutting surface.

Shape – 1V1



Fluting Wheel Performance Characteristics
3M has six standard constructions that are ideal for a variety different operations.



654DJ/144DI
- Phenolic resin bond
- Good cut rate/stock removal
- Holds shape
- Use for lower temperature operations
- Can be run with water
- Ideal for small re-grind shops or in-house re-sharpening

665PK/64PK
- Polyimide resin bond
- Higher cut rate/fast stock removal
- Better form retention
- Designed for higher temperature operations

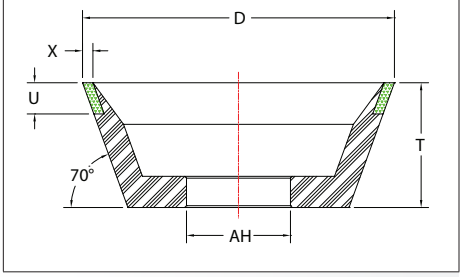
650HJ/154HK
- Hybrid bond
- Fastest cut rate
- Best form retention
- Designed for higher temperature operations than polyimide bond
- Reduced frequency of dressing and minimal "white sticking" required
- Ideal for long, uninterrupted runs

3M™ Primary & Secondary Relief Wheels

Cutting edges are typically "relieved" to enhance chip clearance. Primary relief involves removing material directly behind the cutting edge. For secondary relief, a slight bevel is ground next to the primary relief.

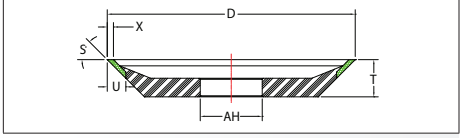
The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. **These wheels are recommended for wet applications.** For dry applications or wheel configurations/grades not listed here, please contact your 3M Customer Service Representative at 1-800-736-2500.

Shape – 11V9

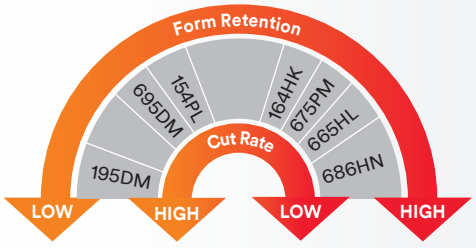


Shapes 12V9 and 11V5 are also commonly used for gashing (see page 7).

Shape – 12V9

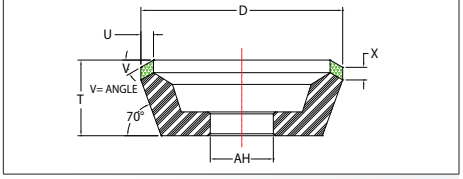


Wheel Performance Characteristics



- Less Form Retention
- Shorter Production Runs
- Free Cutting
- Fast Cutting
- Best Form Retention
- Close Tolerances
- Long Wheel Life
- Long Production Runs
- Slower Cut Rate

Shape – 11V5



Dimensions D × T × AH* (inches)	Abrasive	Grade	Bond	Prod ID	UPC (051141-)
3-3/4 × 1-1/2 × AH X = 1/8 U = 3/8	Diamond	D220	Hybrid	686HN	54864-7
			Polyimide	675PM	54837-1
			Resin	695DM	54869-2
		D280	Hybrid	686HN	54865-4
			Polyimide	675PM	54838-8
			Resin	695DM	54870-8
		D320	Hybrid	686HN	54866-1
			Polyimide	675PM	54839-5
			Resin	695DM	54871-5
		D400	Hybrid	686HN	54867-8
			Polyimide	675PM	54840-1
			Resin	695DM	54872-2
	CBN	B220	Hybrid	164HK	31244-6
			Polyimide	154PL	31233-0
			Resin	195DM	31254-5
5 × 1-3/4 × AH X = 1/8 U = 7/16	Diamond	D320	Hybrid	686HN	54868-5
			Polyimide	675PM	54855-5
			Resin	695DM	54887-6
		D220	Hybrid	686HN	54927-9
	CBN	B220	Hybrid	164HK	31251-4
			Polyimide	154PL	31239-2
			Resin	195DM	31261-3
4 × 3/4 × AH X = 1/8 U = 3/8 S = 30°	Diamond	D320	Hybrid	665HL	54814-2
			Polyimide	675PM	54847-0
			Resin	695DM	54879-1
	CBN	B220	Hybrid	164HK	31250-7
			Polyimide	154PL	31236-1
			Resin	195DM	31258-3
4 × 3/4 × AH X = 1/8 U = 3/8 S = 45°	Diamond	D320	Hybrid	665HL	54813-5
			Polyimide	675PM	54846-3
			Resin	695DM	54878-4
	CBN	B220	Resin	195DM	31257-6
5 × 3/4 × AH X = 1/8, U = 3/8 S = 30°	Diamond	D320	Hybrid	665HL	54831-9
			Polyimide	675PM	54856-2
			Resin	695DM	54888-3
5 × 3/4 × AH X = 1/8, U = 3/8 S = 30°	CBN	B220	Hybrid	164HK	31252-1
			Polyimide	154PL	31240-8
			Resin	195DM	31262-0
5 × 3/4 × AH X = 1/8, U = 3/8 S = 45°	Diamond	D320	Hybrid	665HL	54832-6
			Polyimide	675PM	54857-9
			Resin	695DM	54889-0
5 × 3/4 × AH X = 1/8, U = 3/8 S = 45°	CBN	B220	Hybrid	164HK	31253-8
			Polyimide	154PL	31241-5
			Resin	195DM	31263-7
4 × 1-1/2 × AH U = 1/4, X = 1/4 V = 30°	Diamond	D320	Hybrid	665HL	54895-1
			Polyimide	675PM	54894-4
			Resin	695DM	54893-7

*Arbor hole is made to customer spec. Please specify on order.

3M™ Gashing Wheels

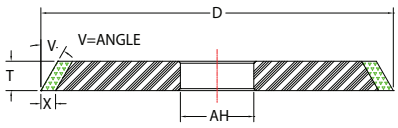
The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. **These wheels are recommended for wet applications.** For dry applications or wheel configurations/grades not listed here, please contact your 3M Customer Service Representative at 1-800-736-2500.

Gashing involves grinding a slot or notch along the cutting face to allow for chip flow.

Dimensions D × T × AH* (inches)	Abrasive	Grade	Bond	Prod ID	UPC (051141-)
4 × 1/4 × AH X = 3/8 V = 30°	Diamond	D280	Hybrid	665HL	54810-4
			Polyimide	675PM	54842-5
			Resin	695DM	54875-3
4 × 3/8 × AH X = 3/8 V = 20°	Diamond	D320	Hybrid	665HL	54815-9
			Polyimide	675PM	54848-7
			Resin	695DM	54880-7
4 × 3/8 × AH X = 3/8 V = 30°	Diamond	D320	Hybrid	665HL	54816-6
			Polyimide	675PM	54849-4
			Resin	695DM	54881-4
	CBN	B220	Polyimide	154PL	31237-8
			Resin	195DM	31259-0
4 × 3/8 × AH X =3/8 V = 45°	Diamond	D320	Hybrid	665HL	54817-3
			Polyimide	675PM	54850-0
			Resin	695DM	54882-1
	CBN	B220	Polyimide	154PL	31238-5
			Resin	195DM	31260-6
5 × 3/8 × AH X = 3/8 V = 20°	Diamond	D320	Hybrid	665HL	54833-3
			Polyimide	675PM	54858-6
			Resin	695DM	54890-6
5 × 3/8 × AH X = 3/8 V = 30°	Diamond	D320	Hybrid	665HL	54834-0
			Polyimide	675PM	54859-3
			Resin	695DM	54891-3
	CBN	B220	Polyimide	154PL	31242-2
5 × 3/8 × AH X = 3/8 V = 45°	Diamond	D320	Hybrid	665HL	54835-7
			Polyimide	675PM	54860-9
			Resin	695DM	54926-2
	CBN	B220	Polyimide	154PL	31243-9
			Resin	195DM	31264-4
6 × 3/8 × AH X = 3/8 V = 30°	Diamond	D280	Hybrid	665HL	54836-4
			Polyimide	675PM	54861-6
			Resin	695DM	54892-0

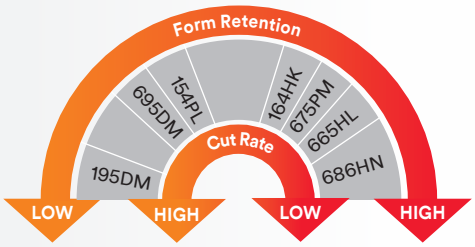
*Arbor hole is made to customer spec. Please specify on order.

Shape – 1V1



Shape 12V9 is also commonly used for gashing (see page 6).

Wheel Performance Characteristics
3M™ Superabrasive Wheels are available in a variety of constructions, each with its own unique characteristics. Choose the 3M Wheel with the best balance of form retention and cut rate for your application.



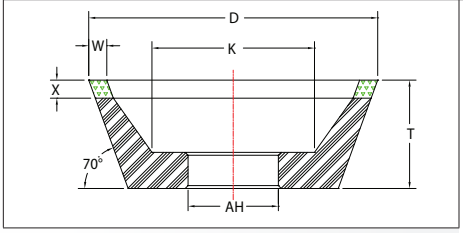
- Less Form Retention
- Shorter Production Runs
- Free Cutting
- Fast Cutting
- Best Form Retention
- Close Tolerances
- Long Wheel Life
- Long Production Runs
- Slower Cut Rate

3M™ Wheels for End Work

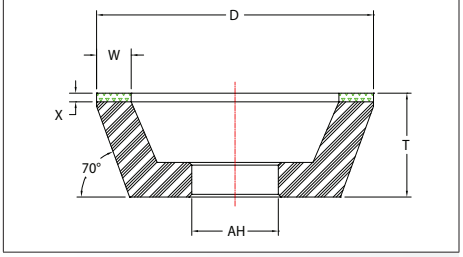
End work involves grinding a small clearance, or relief angle on the face (tip) of the tool to reduce the contact area between the tool and the workpiece.

The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. **These wheels are recommended for wet applications.** For dry applications or wheel configurations/grades not listed here, please contact your 3M Customer Service Representative at 1-800-736-2500.

Shape – 11V2



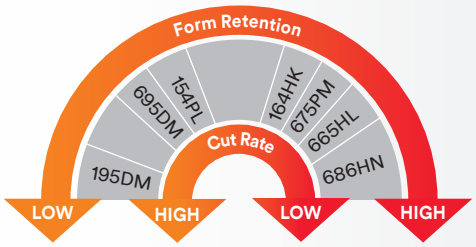
Shape – 11A2



Dimensions D × T × AH* (inches)	Abrasive	Grade	Bond	Prod ID	UPC (051141-)
4 × 1-1/2 × AH X = 1/4 W = 1/4	Diamond	D220	Hybrid	665HL	54862-3
			Polyimide	675PM	54841-8
			Resin	695DM	54873-9
		D320	Hybrid	665HL	54863-0
			Polyimide	675PM	54843-2
			Resin	695DM	54876-0
4 × 1-1/2 × AH X = 1/4 W = 1/4	CBN	B220	Hybrid	164HK	31248-4
			Polyimide	154PL	31234-7
			Resin	195DM	31255-2
4 × 1-1/4 × AH X = 1/4 W = 1/4	Diamond	D320	Hybrid	665HL	54811-1
			Polyimide	675PM	54844-9
			Resin	695DM	54922-4
		D220	Resin	695DM	54874-6
4 × 1-1/4 × AH X = 1/4 W = 1/4	CBN	B220	Hybrid	164HK	31249-1
			Polyimide	154PL	31235-4
			Resin	195DM	31256-9
4 × 1-1/4 × AH X = 1/4 W = 3/8	Diamond	D320	Hybrid	665HL	54812-8
			Polyimide	675PM	54845-6
			Resin	695DM	54877-7
4 × 1-1/4 × AH X = 1/4 W = 3/8	CBN	B220	Hybrid	164HK	54923-1
			Polyimide	154PL	54924-8
			Resin	195DM	54925-5
5 × 1-1/2 × AH X = 1/4 W = 1/4	Diamond	D220	Hybrid	665HL	54824-1
			Polyimide	675PM	54851-7
			Resin	695DM	54883-8
		D320	Hybrid	665HL	54829-6
			Polyimide	675PM	54853-1
			Resin	695DM	54885-2
5 × 1-1/2 × AH X = 1/4 W = 3/8	Diamond	D220	Hybrid	665HL	54825-8
			Polyimide	675PM	54852-4
			Resin	695DM	54884-5
		D320	Hybrid	665HL	54830-2
			Polyimide	675PM	54854-8
			Resin	695DM	54886-9

*Arbor hole is made to customer spec. Please specify on order.

Wheel Performance Characteristics
3M™ Superabrasive Wheels are available in a variety of constructions, each with its own unique characteristics. Choose the 3M Wheel with the best balance of form retention and cut rate for your application.



- Less Form Retention
- Shorter Production Runs
- Free Cutting
- Fast Cutting

- Best Form Retention
- Close Tolerances
- Long Wheel Life
- Long Production Runs
- Slower Cut Rate

3M™ Trizact™ Diamond Polishing Wheel 685DC —Improving Tool Performance

Breakthrough technology allows fast, dependable CNC polishing of cutting tools!

The new 3M™ Trizact™ Diamond Polishing Wheel 685DC is based on an advanced 3M technology that delivers a smooth, mirror finish on carbide and other tool materials. It can make polishing easier, more efficient and consistent, by replacing hand-polishing methods such as SiC brushes, stones and abrasive pastes. And it is designed for use on a variety of CNC grinding machines, for seamless integration into existing manufacturing processes.

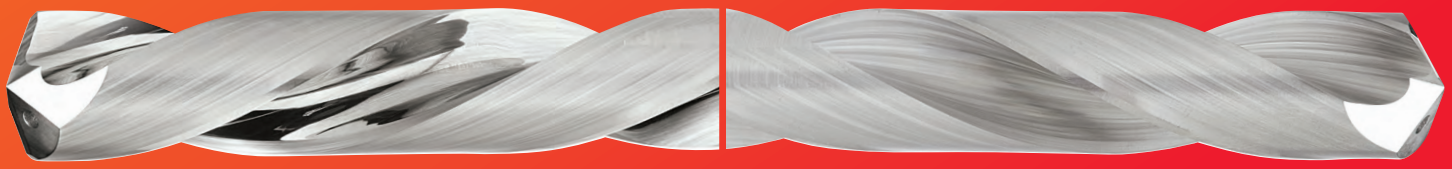
With the development of the 3M Trizact Diamond Polishing Wheel 685DC, tool manufacturers now have the potential to add new value to their products, by building in more customer-pleasing features, including:

- Improved chip flow, reduced loading — especially beneficial for tough-to-machine materials
- Less heat and friction — tools last longer
- Cleaner, more consistent cut
- Improved tool aesthetics

3M Trizact Diamond Polishing Wheels are loaded with diamond particles throughout the entire wheel. As the wheel wears, fresh, sharp diamonds are constantly exposed to the workpiece, resulting in faster, more consistent cutting throughout the life of the wheel.

Polishing Benefits

Polishing round tools to a mirror finish can significantly improve tool life and quality by helping the tool stay cooler and sharper. In addition, a polished tool allows chips to evacuate more easily — particularly on titanium, aluminum, composites and wood.



Tool Polished with 685DC

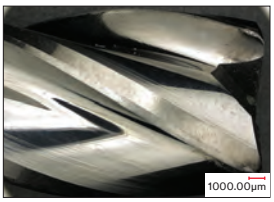
Conventional Tool Finish
Tools supplied by Form Tool Technology, Inc.

Cutting Edge Quality Comparison

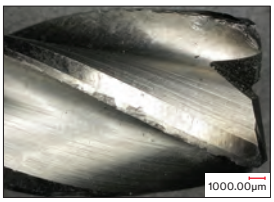
Tool Description:
1/2 inch 4 flute carbide end mill

Application Description:
Slot milling, 1/2 inch depth, 15-5 stainless steel

Note: Polished tool performance may vary by application.



Used Polished End Mill



Used Unpolished End Mill

Ordering Information

Contact: Superabrasives@mmm.com

Wheel Shape: 1A8

Diameter: 3, 4, 5, 6, 7 and 8"

Thickness: 1/8–3/4" (in 1/16" increments)

Arbor Holes: Sized to your specification, with a minimum 1/2" diameter.

Made-to-order (not in stock).
Not eligible for 2-Day shipping.

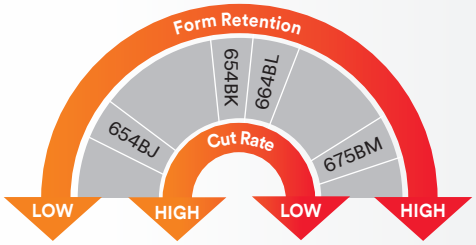
3M™ Cut-Off Wheels

Cut-Off wheels are thin abrasive wheels used to trim blanks to length. They are typically used on the cutting end of the tool when re-grinding and on the shank end when forming a blank.

The wheels listed in this catalog are in stock and intended as a general starting point for the application indicated. Many other wheel configurations and grades are available. Contact your 3M Customer Service Representative at 1-800-736-2500.

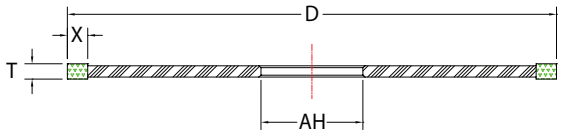
Shape – 1A1R

Cut-Off Wheel Performance Characteristics



- Less Form Retention
- Shorter Production Runs
- Free Cutting
- Fast Cutting
- Best Form Retention
- Long Wheel Life
- Long Production Runs
- Slower Cut Rate

Dimensions D × T × AH (inches)	Abrasive	Grade	Prod ID	UPC
6 × 0.35 × 1-1/4 X = .25	Diamond	D100	654BJ	051141-54951-4
			654BK	051141-30581-3
			675BM	051141-54952-1
		D120	664BL	051141-54953-8
		D220	654BJ	051141-54954-5



Truing & Dressing

3M™ Dressing Wheels

Silicon carbide dressing wheels are used to true and dress superabrasive grinding wheels.

***GC** = Green Silicon Carbide Premium quality for longer life
C = Black Silicon Carbide Standard quality, softer construction provides freer and faster cut

Dimensions D × T × AH (inches)	Abrasive	Grade*	Prod ID	UPC
8 × 1/2 × 1-1/4	Silicon Carbide	C80	400TI	051141-54900-2
		GC80	400TI	051141-54906-4
8 × 1/4 × 1-1/4	Silicon Carbide	C80	400TI	051141-54901-9
			400TK	051141-54910-1
		GC80	400TI	051141-54907-1
			400TG	051141-54896-8
			400TH	051141-54898-2
		GC220	400TI	051141-54905-7
8 × 3/4 × 1-1/4	Silicon Carbide	C80	400TI	051141-54902-6
			400TK	051141-54911-8
		GC80	400TI	051141-54908-8
8 × 3/8 × 1-1/4	Silicon Carbide	C80	400TI	051141-54903-3
			400TK	051141-54912-5
		GC80	400TH	051141-54899-9
			400TG	051141-54897-5
			400TI	051141-54909-5
		GC120	400TI	051141-54904-0

3M™ Dressing Sticks

The most common means of dressing superabrasive wheels. Made of aluminum oxide or silicon carbide in popular sizes.

1/2 × 1/2 × 4	Aluminum Oxide	AO500	200TK	051141-54914-9
1/2 × 1/2 × 4		AO220	200TH	051115-20807-2
3/4 × 3/4 × 4		AO150	200TG	051115-20808-9
3/4 × 3/4 × 4		AO500	200TK	051141-54915-6
1 × 1 × 6		AO220	200TH	051115-20809-6
1/2 × 1/2 × 3	Silicon Carbide	SC320	200TI	051141-54913-2

3M™ DSD Truing Tools

Made of a 3M proprietary alloy, excellent for truing resin bond diamond and CBN wheels. Will true straight ODs, angles or sides of wheels. Must be used without coolant.

Application	Size D × L (inches)	UPC
For use with 3M™ Holding Blocks	1/4 × 1-3/4	051115-20817-1
	3/8 × 1-3/4	051115-20818-8
	1/2 × 2	051115-20819-5
For thru-feed truing and dressing of resin bond centerless wheels	5/8 × 2	051115-20820-1

3M™ Holding Blocks

Used to mount 3M™ DSD Truing Tools for truing resin bond diamond and CBN wheels.

Application	For Use With	UPC
Standard-Duty	1/4 in. or 3/8in. diameter tools	051115-20821-8
Heavy-Duty	3/8 in. or 1/2 in. diameter tools	051115-20822-5

Custom Wheel Request

1. Are you manufacturing new tools or resharpening?

☐ Manufacturing ☐ Resharpening

2. What is your application?

☐ Fluting ☐ OD Grinding ☐ Step Grinding
☐ Gashing ☐ Primary Relief ☐ Other _____
☐ End Work ☐ Secondary Relief

3. What kind of material are you grinding?

☐ Carbide ☐ High Speed Steel ☐ Other _____

4. What type of equipment are you using?

☐ CNC Grinder ☐ Manual Tool & Cutter ☐ Other _____

If CNC Grinder...what is the model?

☐ ANCA – HP _____ ☐ Walters – HP _____
☐ Rollomatic – HP _____ ☐ Tru Tech – HP _____
☐ Other _____ – HP _____

5. What type of coolant are you using?

☐ Straight Oil ☐ Water Based ☐ Other _____
Chilled? ☐ Yes ☐ No

6. What is the size/grade of your wheels(s)?

Wheel Shape	Diameter	Thickness	Hole	Grade	Also Specify:
1F1					Radius:
1V1					Face Angle:
11A2					Rim Width:
12A2					Rim Width:
11V9					
12V9					
1A1R					
Other:					

7. What do you want to change/accomplish?

☐ Cut Faster ☐ Better Finish ☐ Less Frequent Sticking
☐ Run Longer Without Re-truing ☐ Other _____

8. Which wheels have you tried?

Which 3M wheels in this brochure have you tested? _____

_____

If none, what wheels do you currently use? _____

_____

Can't find what you need?

If you don't see what you need in this catalog, simply provide us with the information to the left, and we'll help you select the optimal product for your application.

Contact 3M Customer Service for more information:

E-mail superabrasives@mmm.com
Fax 973-884-0392
Phone 800-736-2500

To place an order, specify:

Shape, Dimension, Mineral, Grade, Product ID

Product Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

Warranty, Limited Remedy and Disclaimer: Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability: Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

3M Abrasive Systems Division
3M Center, Building 21-1W-10
St. Paul, MN 55144-1000

Phone 1-866-279-1235
Web 3M.com/superabrasives

Issued: 9/15 61-5002-8282-9