

3M Industrial Business
3M™ Abrasives for Stainless Steel Finishing



Systems for Stainless Steel Finishing

The Efficient and Economical Way
to Produce Exceptional Finishes.

3M

3M™ Stainless Steel Finishing System — Weld

Step 1 – Leveling the Weld

Using the following products for weld leveling helps prepare stainless steel for #3 and #4 finishes.

Recommended Starting Points



3M™ Fibre Disc 785C

(Grade 60; 7" diameter)

- Contains 3M™ Cubitron™ Abrasive Grain.
- An excellent starting point for stainless steel and high nickel alloys.
- Includes a grinding aid for cooler running temperatures.



3M™ Fibre Disc 985C

(Grade 60; 7" diameter)

- 3M's most aggressive mineral, 3M™ Cubitron™ Abrasive Grain, makes this the best choice for a long-lasting, high performance disc for stainless steel grinding.
- Includes a grinding aid for cooler running temperatures.
- Sustains high cut rates over long periods of time.

Work Hint: Use the finest grade of abrasive that gets the job done; finer grind lines are easier to remove. Align the grind line scratches with the grain line direction of the original stock. Perpendicular scratches are more difficult to blend; parallel scratches blend easily during finishing. Use a 7" dia. black ribbed faceplate to level the weld quickly and leave fine grind lines.

Alternative Selections



3M™ Flap Disc 947D/747D

(Grade 60; 7" diameter)

- Contains 3M™ Cubitron™ Abrasive Grain.
- An excellent option for stainless steel finishing.
- Exceptional cut life on hard metals.
- Available in convenient "Quick Change" option.



3M™ Roloc™ Disc 777F

(Grade 60)

- Contains 3M™ Cubitron™ Abrasive Grain
- Constructed on a YF-wt., water resistant polyester cloth backing.
- Includes a grinding aid for cooler running temperatures.

Recommended Tools and Speeds:

3M™ Disc Sander (PN20231) — 20,000 RPM (2" dia.)

3M™ Disc Sander (PN20232) — 15,000 RPM (3" dia.)

3M™ Disc Sander (PN28329) — 12,000 RPM (4" dia.)



3M™ Roloc™ Durable Edge Disc 977F

(Grade 60)

- Contains 3M™ Cubitron™ Abrasive Grain
- Reinforced YF-wt. backing for improved edge durability.
- Roloc™ TSM Attachment System features strong metal to metal locking system.

Recommended Tools and Speeds:

3M™ Disc Sander (PN20231) — 20,000 RPM (2" dia.)

3M™ Disc Sander (PN20232) — 15,000 RPM (3" dia.)

Consistent Cutting
with Sharp & Bright
Finishes

Leveling to Final Finish in 3 Easy Steps

Step 2 – Setting the Grain

Use these products to generate a directional scratch to prepare stainless steel for final finishing.

Recommended Starting Point



3M™ Belt 777F (Grade P120)

- Contains 3M™ Cubitron™ Abrasive Grain with polyester cloth backing.
- Contains a grinding aid which enhances performance on stainless steel and other exotic alloys.

Recommended Tools and Speeds:
3M™ Inline Sander (PN28339) — 3,500 RPM
with 3M™ Expander Wheels (PNs 28348 or 28349)

Work Hint: Attempt to stay as close as possible to the weld area to minimize final blending. Be careful when selecting the abrasive grade, as severe grind lines will result in more conditioning time and reduced productivity.

Alternative Selections



3M™ Belt 747D (Grade P120)

- Contains 3M™ Cubitron™ Abrasive Grain.
- Cloth belt constructed on a X-wt. durable cloth backing with semi-flexible handling characteristics.
- Includes a grinding aid for cooler running temperatures.

Recommended Tools and Speeds:
3M™ Rubber Slotted Expander Wheels (PN77720*)
3M™ Die Grinder (PN20239) — 12,000 RPM

*Use with 2" diameter x 1" wide abrasive band or belt.



3M™ Flap Wheels 747D (Grade 80; 3" x 1" x 1/4")

- Contains 3M™ Cubitron™ Abrasive Grain.
- Constructed on a resin-bonded X-wt., durable cloth backing.
- Provides a uniform finish.
- Features a grinding aid for cooler grinding of stainless steel.

Recommended Tools and Speeds:
3M™ Die Grinder (PN20238) — 18,000 RPM (3" dia.)

Step 3 – Final Finishing: Choose

Generate a #3 through a #8 stainless steel finish with these 3M Products.

Recommended Starting Point for #3 Stainless Steel Finish



Scotch-Brite™ Surface Conditioning Belt (A Coarse)

- Premium surface conditioning non-woven web belt.
- Designed for cleaning, finishing, and light deburring.
- Reduces loading and heat build-up which increases life and performance.

Recommended Tools and Speeds:
• 3M™ Inline Sander (PN28338) — 1,600 RPM
with 3M™ Expander Wheel (PN28348) 5" dia.
• 3M™ Inline Sander (PN28339) — 3,500 RPM
with 3M™ Expander Wheel (PN28349) 3.4" dia.

Work Hint: Finish a small area on the corner of the piece. Examine the finish from several angles. The match, while not exact, will be close. With a little practice you can "feather" in and out of the repair area. A few slow passes should restore the finish. Use the longest stroke that is comfortable. Working with the grain, ease off pressure on both ends of the strokes.

Alternative Selection



Scotch-Brite™ Multi-Finishing Wheel (2S Coarse)

- Produces uniform grain finishes on stainless steel and other metals.
- Highly conformable and tough enough to finish edges and welds.
- Works well on large surfaces.
- 6" wheels are available in 1", 2" and 3" widths.

Recommended Tools and Speeds:
3M™ Inline Sander (PN28338) — 1,600 RPM

Use Your Finish

Recommended Starting Point for #4 Stainless Steel Finish



Scotch-Brite™ Surface Conditioning Belt (A Medium)

- Constructed with a non-woven nylon material.
- Designed for cleaning, finishing and light deburring.

Recommended Tools and Speeds:

- 3M™ Inline Sander (PN28338) — 1,600 RPM with 3M™ Expander Wheel (PN28348) 5" dia.
- 3M™ Inline Sander (PN28339) — 3,500 RPM with 3M™ Expander Wheel (PN28349) 3.4" dia.

Recommended Starting Points for #5– #8 Stainless Steel Finishes

3M™ Trizact™ Abrasive Belts

217EA, 237AA, 327DC, 337DC, 347AC
(Grade A 100)

- 217EA is a flexible belt for intermediate to final finishing, and is for low to medium pressure applications.
- 237AA, 327DC, 337DC and 347AC are perfect choices for dry metalworking applications, and are semi-flexible for intermediate to final finishing.
- All contain a grinding aid to assist in cutting and keeping the workpiece cool.

Recommended Tools and Speeds:

3M™ Inline Sander (PN28339) — 3,500 RPM
with 3M™ Expander Wheels (PNs 28348 or 28349)

Alternative Selections



Scotch-Brite™ Surface Conditioning Belt (S Medium)

- A tough, non-woven nylon abrasive.
- Impregnated web construction.
- Silicon carbide mineral provides a bright and sharp finish.

Recommended Tools and Speeds:

- 3M™ Inline Sander (PN28338) — 1,600 RPM with 3M™ Expander Wheel (PN28348) 5" dia.
- 3M™ Inline Sander (PN28339) — 3,500 RPM with 3M™ Expander Wheel (PN28349) 3.4" dia.



Scotch-Brite™ Multi-Finishing Wheel, (2S Medium)

- Uniform and final finishes on ferrous and non-ferrous metals.
- Designed for cleaning, finishing and light deburring.
- Conformable to work surface.
- Can finish edges and welds as well as large surfaces.
- 6" wheels are available in 1", 2", 3" widths.

Recommended Tools and Speeds:

3M™ Inline Sander (PN28338) — 1,600 RPM

3M™ Trizact™ Abrasive Belts

Trizact abrasives feature three-dimensional structures uniformly distributed over the entire surface of the belt, ensuring consistent performance and the reduction of belt-to-belt variation. Conventional abrasives, which feature randomly arranged minerals, can wear and finish unevenly.

Trizact abrasives were developed with polishing in mind. Trizact belts start sharp and stay sharp, resulting in more predictable finishes and improved, consistent quality in your parts.



Level welds quickly to match #3 and #4 directional mill finishes

In three easy steps, using the 3M finishing system, you can grind and blend welds to match #3 or #4 finishes.



Step 1: Leveling the Weld

Abrasive: 3M™ Fibre Disc 785C, 7", Grade 60, featuring 3M™ Cubitron™ Abrasive Grain.



Step 2: Setting the Grain

Abrasive: Set directional grain with 3M™ Cloth Belt 777F, Grade P120.
Tool: 3M™ Inline Sander (28339) 3,500 RPM with 3M™ Expander Wheel (28348/28349).

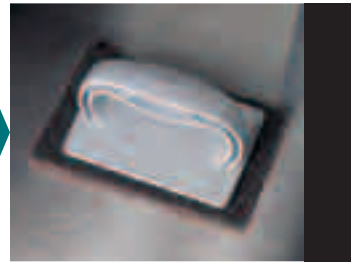


Step 3: Final Finishing

Abrasive: Scotch-Brite™ Surface Conditioning Belt, A MED to blend surface to a #4 finish.

Tool: 3M™ Inline Sander (28338) 1,600 RPM with 3M™ Expander Wheel, 5" dia. (28348)

— or —
3M™ Inline Sander (28339) 3,500 RPM with 3M™ Expander Wheel, 3.4" dia. (28349)



Final Blending and Touch-Up Applications

Use a Scotch-Brite™ Hand Pad 7446 for final blending and touch-up of stainless steel finishing.

Finishing has never been easier

A complete system of 3M tools and accessories to make your finishing job simpler.

3M™ Disc Sanders

3M got the right angle "right" on these new Disc Sanders for metalworking. A 97° head angle (vs. 90°) allows for more comfortable wrist position and improved ergonomics. The lightweight, compact design generates less vibration and allows for better control. Features adjustable directional exhaust. Hard 3M™ Roloc™ Disc Pad and 1/4-inch collet included.



Part #	Diameter	Max RPM	Motor
20231	2"	20,000	.5 HP
28341	2"	20,000	.3 HP
20232	3"	15,000	1 HP
28329*	2"	12,000	.5 HP

*Also supports 3" and 4" backup pads.

3M™ Inline Sanders

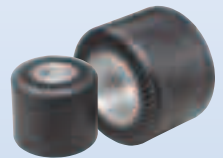
Generate straight line scratches for finishing stainless steel and other metals. These straight shaft sanders can be used with inflatable or slotted wheel accessories. 3M recommends 3M™ Rubber Slotted Expander Wheels (PNs 28348 or 28349).



Part #	Max RPM	Motor
28338	1,600	1 HP
28339	3,500	1 HP

3M™ Rubber Slotted Expander Wheels

Internal slotted rubber drum expands with centrifugal force to keep the belt tight while grinding. Designed with a 1/4" radius to help prevent transition marks from edge of belt. Use #3 Wheel Adaptor Kit (PN45038) to mount to a 3M™ Inline Sander.



Part #	Dimensions	Belt Size
28348	5" x 3-1/2"	3-1/2" x 15-1/2"
28349	3.4" x 3"	3" x 10-11/16"

3M™ File Belt Sander

Uses coated abrasive and Scotch-Brite™ Belts (1/8"–3/4" x 18"–24") for a wide variety of metalworking applications. Steel drive wheel attached. Includes standard attachment arm (PN28368) and rubber drive wheel. 24" belts require 3M™ File Belt Sander Extension (PN28376).



Part #	Max RPM	Motor
28366	22,000	.6 HP

3M™ File Belt Sander Attachment Arm — Corners Style

Sand corners and grooves with contact wheel. Use with coated abrasive and Scotch-Brite™ Belts.



Part #	Belt Size
28372	1/8" or 1/4" x 18"

3M™ File Belt Sander Attachment Arm — Vessel Arm

Sand with contact wheel. Unique large arm used for blending weld seams. Use with coated abrasive and Scotch-Brite™ Belts. Includes tracking/control knob.



Part #	Belt Size
28375	1/4" or 1/2" x 24"

Abrasive and accessory sold separately.

Right Angle Weld Grinding System

3M offers a complete system using coated abrasive and surface conditioning belts for leveling, blending and finishing right angle welds on stainless steel. The advantages of this system are easier access, faster stock removal and less undercutting than other methods such as grinding wheels, cut down wheels, coated abrasive square and cross pads and other products frequently used to finish fittings, manways, frames and bracing.

Step 1: Weld Cut Down

Begin the process by using a 1/4" x 24" 3M™ Belt 977F, grade 50, for cutting down the weld. This belt contains 3M™ Cubitron™ Abrasive Grain and a grinding aid for fast cuts and cooler running on stainless steel.

Tech Tip: Keep tool moving to reduce undercuts, work in the center of the weld leaving a slight transition line of material, or witness, on both sides of the weld.

Step 2: Refinement

Use a 3M™ Belt 777F (Options: 947D and 907EA), grade P120, with a scalloped edge to remove the witness lines and refine the finish. It is critical to leave only a slight transition line during step 1 so the finish can be refined without undercutting.

Tech Tip: 777F P120 works better under lower pressure. It is critical to leave only a slight transition line from step 1 as removing too much material in step 2 can lead to undercutting.

Step 3: Final Finishing

For the final finish, select a Scotch-Brite™ Surface Conditioning Belt.

Tech Tip: Grade A Medium is a good starting point.

Optional Step 4: For Other Finishes

To achieve a pharmaceutical finish, choose 3M™ Trizact™ Belt 237AA in a series of grades A100, A45 and A16. Also to obtain a surface finish of less than 32 micro-inch for dairy applications, refine the repair area after step 2 with a 3M™ Trizact™ 237AA, grade A100, scalloped edge belt followed by a fourth step of Scotch-Brite™ Surface Conditioning Belt in grade A Very Fine.



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Troubleshooting Guide for Stainless Steel Repair

Problem	Solution	Problem	Solution
Heat or warpage	<ul style="list-style-type: none"> • Use coarser grade abrasive • Reduce speed • Use new abrasive • Use harder disc pad 	Flap wheel bounce	<ul style="list-style-type: none"> • Reduce speed and/or pressure • Use smaller wheel
		Multi-finishing wheel bounce	<ul style="list-style-type: none"> • Reduce speed • Dress wheel to round
Edge cutting	<ul style="list-style-type: none"> • Use softer disc pad • Reduce angle of grinder 	Smearing	<ul style="list-style-type: none"> • Reduce speed • Clean or replace contaminated product
Disc scratches show through	<ul style="list-style-type: none"> • Use finer grade leveling disc • Increase speed 	Tool stalling	<ul style="list-style-type: none"> • Check for proper air supply at tool • Increase torque and/or HP of tool
Chatter	<ul style="list-style-type: none"> • Reduce speed and/or pressure 	Streaking on final finish	<ul style="list-style-type: none"> • Use hand pad holder



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