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**Operations & Maintenance Manual
For Commercial Use Only**



PRO SERIES RECYCLING EXTRACTOR

- MODEL NO: 98820 PRO500
- MODEL NO: 98822 PRO 500 w/Wand and Combo Tool, and 33' hose
- MODEL NO: 98824 PRO 500 w/Wands and Hose
- MODEL NO: 98826 PRO 500 OZ
- MODEL NO: 98828 PRO 500 OZ w/Wand and 33' Hose
- MODEL NO: 98821 PRO 500 230V
- MODEL NO: 98823 PRO 500 230V w/Perfect Heat
- MODEL NO: 98830 PRO 500 w/Heat and Perfect Heat
- MODEL NO: 98832 PRO 500 w/Heat and Perfect Heat w/Hand Tool, and 33' Hose
- MODEL NO: 98818 PRO750
- MODEL NO: 98836 PRO 750 w/Wand and Combo Tool, and 33' Hose

NOTES

Serial Number

The serial number of the machine is located on the nameplate, located next to pressure regulator. This information is needed when ordering parts or scheduling repairs. Fill in the information below for future reference:

Serial Number _____

Part Number _____

Purchase Date _____



PROTECT THE ENVIROMENT
Please dispose of packaging materials in an enviromentally safe way according to local waste disposal regulations.

Always remember to recycle.

Within 30 days, to activate the warranty, go to;
<https://tornadovac.com/services/warranty-registration-form.aspx>

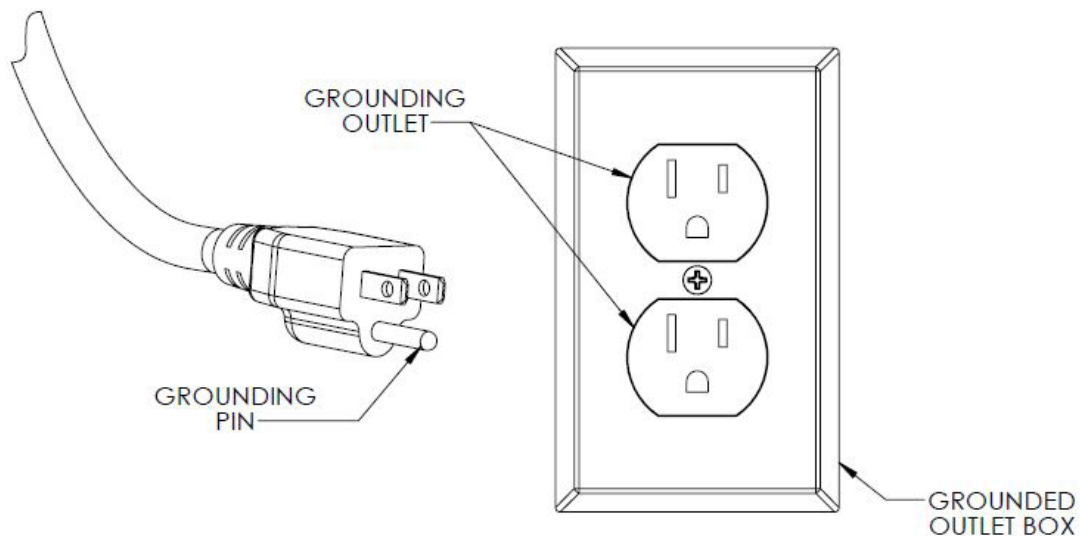
For warranty information go to www.tornadovac.com

GROUNDING INSTRUCTIONS

This appliance must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk electric shock. This machine is equipped with a cord having an equipment -grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the appliance - if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This appliance is for use on a nominal 115-volt circuit, and has a grounding plug that looks like the plug illustrated in sketch A.



A

Your new Tornado unit is a high quality, precision-made product. All parts used in the manufacturing of this unit have passed rigid quality control standards prior to assembly. Please safeguard the original receipt / invoice. If you experience any problems with your unit during the warranty period, the original receipt / invoice will act as proof of purchase. Contact Tornado for any warranty inquiries.

IMPORTANT SAFETY INSTRUCTIONS

READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE USING THIS UNIT

Read and understand this owner's manual and all labels on the unit before operating. Safety is a combination of common sense, staying alert and knowing how your unit works. Use this unit only as described in this manual. Use only manufacturer's recommended attachments. To reduce the risk of personal injury or damage to your unit use only Tornado recommended accessories.

SAFETY INSTRUCTIONS

These guidelines are provided for your protection and convenience. Please read them carefully. If you have any questions regarding the use of your equipment call Technical Service at 800.880-2913 (ext. 3). Failure to adhere to instructions provided can potentially void any warranties. Precautions and safety warnings are provided for your protection. Failure to observe these warnings could result in personal injury and damage to the equipment. When using an electrical appliance, basic safety precautions should always be followed.



WARNING! To reduce the risk of electric shock, fire, or injury:

1. Operators must read and understand this manual completely before operating the equipment.
2. Make sure all caution, warning, and instructional decals are in place and legible. Replace damaged or missing labels.
3. Do not leave unit when plugged in. Unplug from outlet when not in use and before servicing.
4. Connect to a proper grounded outlet only. (See Grounding Instructions.)
5. Do not use with damaged cord or plug.
6. Do not handle plug or unit with wet hands.
7. Do not pull or carry by cord, use cord as a handle, close a door on cord, or pull cord around sharp edges or corners. Do not run appliance over cord. Keep cord away from heated surfaces.
8. Turn off all controls before unplugging.
9. Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
10. Do not put any object into openings. Do not use with any opening blocked; keep free of dust, lint, hair, and anything that may reduce air flow.
11. Do not pick up anything that is burning or smoking, such as cigarettes, matches, or hot ashes.
12. Do not use without filters in place.
13. Use extra care when cleaning stairs.
14. Do not use to pick up flammable or combustible liquids such as gasoline or use in areas where they may be present.
15. Do not expose to rain. Store indoors.
16. If unit is not working as it should, has been dropped, damaged, left outdoors, or dropped into water, take it to a local Tornado service center.

PRO SERIES Technical Specifications

Model	98820	98822	98824	98826
Tank Size	13 Gallon	13 Gallon	13 Gallon	13 Gallon
Heater	No	No	No	No
Perfect Heat	No	No	No	No
Ozone	No	No	No	Yes
Tools*	No	Yes	Yes**	No
Power	115V/20A	115V/20A	115V/20A	1115V/20A
Power Cords	(1) 25' Detachable	(1) 25' Detachable	(1) 25' Detachable	(1) 25' Detachable
Vacuum Motor	Dual 2 Stage	Dual 2 Stage	Dual 2 Stage	Dual 2 Stage
CFM	101	101	101	101
Waterlift	150"	150"	150"	150"
Solution Pump	100-500 P.S.I.	100-500 P.S.I.	100-500 P.S.I.	100-500 P.S.I.
Body Construction	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank
Front Wheels	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters
Rear Wheels	2-12" Dia	2-12" Dia	2-12" Dia	2-12" Dia
Weight	124 lbs.	124 lbs.	124 lbs.	124 lbs.
Dimensions	38" x 22" x 41"	38" x 22" x 41"	38" x 22" x 41"	38" x 22" x 41"

*Tools include - 11" Rapid Recovery Wand (Type R, 2 Jet) (77000), 3" Combination Tool (77001), and 33' Flexible Hose (77220).

** = Wand and Hose only

PRO SERIES Technical Specifications

Model	98828	98821	98823	98830
Tank Size	13 Gallon	13 Gallon	13 Gallon	13 Gallon
Heater	No	No	No	Yes
Perfect Heat	No	No	Yes	Yes
Ozone	Yes	No	No	Yes
Tools*	Yes	No	No	No
Power	115V/20A	230V/20A	230V/20A	115V/20A
Power Cords	(1) 25' Detachable	(1) 25' Detachable	(1) 25' Detachable	(2) 25' Detachable
Vacuum Motor	Dual 2 Stage	Dual 2 Stage	Dual 2 Stage	Dual 2 Stage
CFM	101	101	101	101
Waterlift	150"	150"	150"	150"
Solution Pump	100-500 P.S.I.	100-500 P.S.I.	100-500 P.S.I.	100-500 P.S.I.
Body Construction	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank
Front Wheels	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters
Rear Wheels	2-12" Dia	2-12" Dia	2-12" Dia	2-12" Dia
Weight	124 lbs.	124 lbs.	124 lbs.	124 lbs.
Dimensions	38" x 22" x 41"	38" x 22" x 41"	38" x 22" x 41"	38" x 22" x 41"

*Tools include - 11" Rapid Recovery Wand (Type R, 2 Jet) (77000), 3" Combination Tool (77001), and 33' Flexible Hose (77220).

PRO SERIES Technical Specifications

Model	98832	98818	98836
Tank Size	13 Gallon	13 Gallon	13 Gallon
Heater	No	Yes	No
Perfect Heat	Yes	No	No
Ozone	No	No	No
Tools*	Yes	No	Yes
Power	115V/20A	115V/20A	115V/20A
Power Cords	(1) 25' Detachable	(1) 25' Detachable	(1) 25' Detachable
Vacuum Motor	Dual 2 Stage	Single 3 Stage	Single 3 Stage
CFM	101	97	97
Waterlift	150"	135"	135"
Solution Pump	100-500 P.S.I.	100-750 P.S.I.	100-750 P.S.I.
Body Construction	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank	Powder-coated aluminum chassis and rotationally-molded polyethylene tank
Front Wheels	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters	2-4" Dia Swivel Casters
Rear Wheels	2-12" Dia	2-12" Dia	2-12" Dia
Weight	124 lbs.	128 lbs.	128 lbs.
Dimensions	38" x 22" x 41"	38" x 22" x 41"	38" x 22" x 41"

*Tools include - 11" Rapid Recovery Wand (Type R, 2 Jet) (77000), 3" Combination Tool (77001), and 33' Flexible Hose (77220).

SET UP INSTRUCTION

Filter Installation

There are three filters in the Pro 500/750: inlet filter, main filter and pump protection filter. It is imperative to the efficient operation of the Pro 500/750 that the filters are installed properly.

Pump Protection Filter – Position on brass fitting on the filter mound. Slide it down.

Main Filter – Wet the rim of the filter and position it on the filter mound. (white plastic disc) Twist and slide over the mound by pushing downward.

Inlet Filter – Position on top of the tank.


OPERATING INSTRUCTIONS

1. Remove lid and inlet filter.
2. Check main filter. Make sure the main filter is installed snugly.
3. Fill tank with water to a desired level. Use solution level gauge. Maximum water temperature to be used is 130° F (54° C).
4. Add in-tank cleaner per chemical label use instructions. In addition, pre-spraying is often desirable and will assist in producing the fastest and best cleaning results. See chemical product labels for more information.

Note: Use caution when moving machine (especially on inclines) with fluid in the tank to prevent fluid from entering vacuum standpipe at back of machine tank and flooding the vacuum.

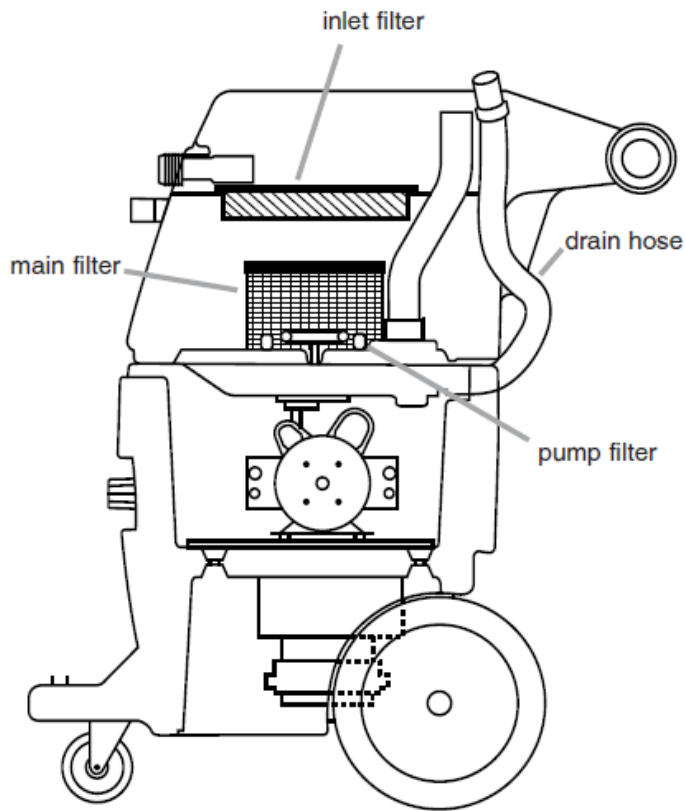
The user MUST ONLY use chemicals that have been specifically formulated to work with CFR technology machines.

5. Prime pump by re-circulating fluid through priming hose, included, for 15-30 seconds. Re-circulating the fluid primes the pump and expels trapped air from the system.
6. Replace inlet filter and lid
7. Attach hose assembly to machine. Connect fluid hose to the quick-disconnect found on the front of machine.
8. Attach the desired tool to the valve end of the hose assembly.
9. Close tank cover lid, turn on vacuum and pump switches.
10. Clean surface with tool attached to hose assembly.
11. During the cleaning process, the fluid level will be reduced and the lower level float switch will shut off the pump. When the pump shuts off, drain and rinse tank, rinse main filter, refill with fresh water and cleaning chemical, and continue cleaning.

 **CAUTION!** When cleaning, monitor foam in the machine's tank. Areas cleaned with other cleaning equipment or chemicals may cause excessive foam to collect in the tank.

 **WARNING! EXCESSIVE FOAM IN THE TANK MAY CAUSE VACUUM MOTOR FLOODING AND MACHINE DAMAGE.**

Pour one to two ounces of Defoam directly into the tank or into the vacuum hose while the vacuum is running. Defoam has been specifically formulated to work with this machine. When finished cleaning, perform the daily maintenance procedure. Be sure that all filters are cleaned thoroughly and replaced in machine. Leave lid off for drying.



Perfect Heat System

⚠ WARNING! The Perfect Heat™ Plus System can produce very hot water that could damage some delicate fabrics and fibers. Please ensure the surface being cleaned will not be damaged by applying hot water up to 200° F (93° C).

This machine is equipped with the Perfect Heat™ Plus System for heating the cleaning solution. This system uses a combination of the patent pending Perfect Heat™ coils and an inline electrical heater.

Operation:

1. Follow operating instructions steps for filling the machine with water and cleaning solution.
2. Turn on electrical heater, switch is located on panel.
3. Pre-heat machine for 5-10 minutes before use.

NOTE: There is a valve in the upper compartment that either sends the water through the heating components, or bypasses them. The machine is preset in the “HOT” position. To clean with cold water, turn the valve to “COLD” or UP position. This should be done prior to filling the tank with water. For general cleaning, it is recommended leaving the valve in the “HOT” or down position and cleaning with hot water.

MAINTENANCE

Daily Maintenance

To maintain optimum performance, the equipment, tools and filters should be cleaned after each use. Replace any filters that cannot be cleaned or are damaged. Nozzles that cannot be cleared should be discarded. Wipe down the equipment with a damp cloth to keep clean and preserve the appearance.

1. Wands and Tools

Rinse opening of tool with water to eliminate any debris.

Wand only – open and clean in-line strainer.

A. Disconnect the In-line Strainer by using the quick disconnect coupler.

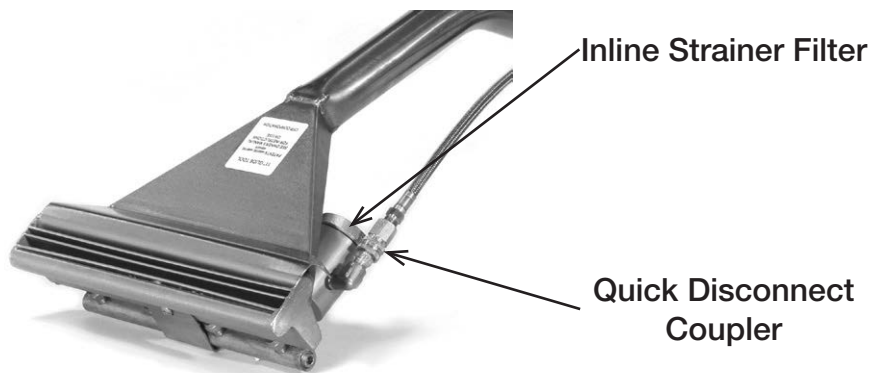
B. Remove the filter and rinse with water.

C. Remove any debris from the strainer.

D. Keep o-ring and threads of the plug lubricated.

DEFOAM is a good lubricant or use a non-petroleum based lubricant. This will ensure a tighter seal.

Wipe tool with damp cloth and store with head up to prevent clogging of nozzle.



2. Filters

In-Line Strainer Filter – Disconnect the In-line Strainer Filter on the wand by using the quick disconnect coupler. Remove the filter and rinse with water. Remove any debris from the strainer. Keep o-ring and threads of the plug lubricated. DeFoam is a good lubricant or use a non-petroleum based lubricant. This will ensure a tighter seal.

Inlet Filter – Remove the inlet filter. Dump and clean debris at the end of each cleaning job.

Main Filter – Remove the main filter sleeve and rinse out and clean thoroughly.

Pump Protection Filter – This ball-shaped filter should be in place when the tank is cleaned and rinsed. Remove and rinse only after the tank is rinsed.

Periodic Maintenance

1. Check power cord for any breaks, separations, or cuts. Make sure the ground pin on the connector is intact or the machine will be unsafe. Make sure the ground pin on all three prongs on the twist lock connector are intact.
2. Check for plugged nozzles when using tools. If streaking occurs during cleaning, a plugged nozzle may be the cause. A plugged or partially plugged nozzle can be identified by holding the tool 5-7" above the surface and checking for an even spray pattern. To clean a plugged nozzle, remove the nozzle and direct pressurized air backwards through the nozzle or backwash the nozzle with water. A convenient method is to insert the nozzle into a garden hose ball valve, tighten the ball valve to a faucet, and turn on the water. (Ball valves are available, part #7AX020). Inspect nozzle and repeat cleaning procedure, if necessary. Discard nozzles that cannot be cleared. Tool nozzles wear and must be replaced after 200-250 hours of use.
3. Occasionally open the base and inspect hose and other connections for leaks. Repair or replace any leaking parts. Always disconnect power cord, before removing side panels.
4. It is very important to monitor machine operating hours for proper maintenance of the motors and pumps. After 700 hours of operation, the vacuum motor brushes should be inspected by an authorized repair station and replaced if worn (length is .5 inches or less).
5. Check vacuum motor performance using a vacuum gauge. Place this gauge on the tank inlet fitting with the vacuum turned on. Water lift should be between 135 and 150 inches. If the reading is lower, check for air leaks in the tank, cover gasket, and drain hose.
6. Check pump performance occasionally against built-in pressure gauge. Pump running pressure on the PRO 500 should be 500 + 10 p.s.i, PRO 750 should be 750+ 15 p.s.i. If the pressure is outside of this range, call your dealer or authorized service center. After 400 hours, the pump valves should be replaced. After 700 hours of operation the pump cam bearing and plunger should be replaced. The pressure regulator should be rebuilt after 400 hours of operation.

TROUBLE SHOOTING GUIDE

Vacuum or pump will not run	Check that electrical cord is firmly seated in wall outlet. Check and reset building circuit breaker if tripped. Check vacuum/pump switch. It should be in the "ON" position.
Trips building circuit breaker	Circuit is overloaded – move cord to a different wall outlet. If using an additional extension cord, make sure it is in good condition, less than 70 feet long and AWG#10 gauge or heavier. Check plug end and cord for damage.
Vacuum won't run.	Check vacuum switch. It should be in the "ON" position. Check circuit breakers and reset if tripped. (located on base of machine)
Pump won't run	Check pump switch – it should be in the "ON" position. Check pump circuit breaker (5 amp) and reset if tripped. Check fluid level, must have at least 5 gallons in tank. Check fluid level inside of Main Filter Cage – pump float must be at highest position to operate. If fluid is lower inside filter, drain tank and remove and clean filter.
Pump tries to run and then blows circuit breaker	Check power cord for frayed, cut or worn spots. If using an extension cord, make sure it is in good condition, less than 70 feet long and AWG #10 gauge or heavier. Check pump static PSI – must be 400 psi or less Check wall outlet voltage. If below 105 volts, pump will not work.
Pump starts and stops	Check for dirty Main Filter. Water level should be the same inside and outside of filter. Check for sticking pump float. Check fluid level – must have at least 5 gallons in tank.

Water dripping from bottom of machine exhaust.	Check machine for excess foaming. Add Defoam to tool hose and tank. Open machine top cover and let vacuum run for 10 minutes to dry out vacuum motor, then close lid and resume cleaning.
Vacuum hose or tool leaks.	Leave vacuum running for 1 minute when finished cleaning to clear hose. Check for holes/breaks in vacuum hose. Make sure the inline strainer is properly tightened and fluid hose connectors are fully seated.
Carpet too wet.	NOTE: Floor tool is used in forward direction only. Check carpet tool position – head must be completely “seated” on carpet to provide good drying times. Check tool and hose for any obstructions. Check lid cover sealing properly – is filter case properly seated in tank? Is lid gasket in good shape with no cuts, cracks, or worn/compressed areas? Check for cracks in lid cover. Check drain hose and fittings for cracks and tears. Check tool hose for holes, cracks, or cuts. Check hose cuffs – must seat firmly on tank fitting and tool. Check water dripping from bottom of machine exhaust. If present, check machine for excess foaming. Check carpet installation. Some carpets are installed on uneven surfaces with ridges and bumps. It is difficult to get good drying times with this type of installation.
Streaks on carpet.	Check tool and hose for obstructions. Check and clean inline strainer filter. Check and clean main filter. Check and clean stainless back flush filter screen inside tank. Check nozzles for full spray. Clean if clogged or replace if worn. Check pump pressure drop while cleaning. Should not drop more than 100 p.s.i. Make sure air is out of system by re-priming pump. If there is still a problem, remove and clean back flush filter screen. Make sure strokes overlap a minimum of 3 inches. Check chemical usage instructions for proper application. Multiple cleanings may be needed to clean deeply imbedded dirt that is pulled to the surface. Offset cleaning passes by 6 inches.
Excessive pressure drop when cleaning. (exceeds 100 p.s.i.)	Adjust static pressure to 500/750 p.s.i. when not cleaning. Check and clean main filter and inner stainless back flush filter. Check and replace worn spray nozzles and loose or leaking fittings on hose. Purge excess air from pumping system using hose with no nozzle or priming hose.

PRO Series Chemicals

Name	Use	Part Number
A Excell (4 x 1 gallon)	Light acid based cleaner	78006
Excell (4 x 1 gallon)	Alkaline based cleaner	78004
Excell (5 gallon)	Alkaline based cleaner	78005
Perform-All (4 x 1 gallon)	Neutral pH cleaner	78007
Perform-All (5 gallon)	Neutral pH cleaner	78008
Perform-All Plus (4 x 1 gallon)	Neutral pH cleaner	78009
Defoam (12 x 1 Pint)	Defoamer	78033
Defoam (1 gallon)	Defoamer	78015
Defoam (4 x 1 gallon)	Defoamer	78016
Defoam (5 gallon)	Defoamer	78017
O-Z Clean (4 x 1 gallon)	In-tank cleaner	78012
O-Z Clean (5 gallon pail)	In-tank cleaner	78032

