



Samsung ML-2160 refill instructions

Also suitable for: ML-2165 / ML-2165W / SCX-3405 / SCX-3405W / SCX-3405FW.

Before use, familiarise yourself with the safety information on pages 6 and 7.

Take maximum care when using power and hand tools. Consider the safety and protection of eyes and hands with regard to accidental slippage and/or breakage of the tool.

Consider doing the refill on top of sheets of old newspaper in case of accidental spills.

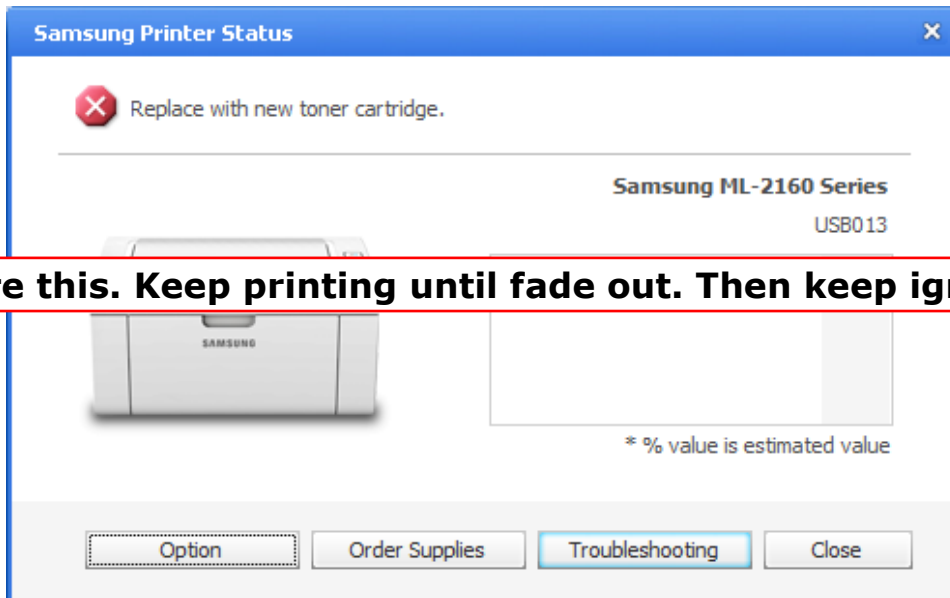
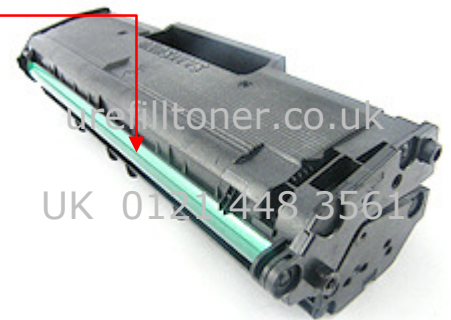
Protect green OPC drum while handling, keep from direct sunlight

As you work with the cartridge, protect the green OPC drum at all times. Never expose it to direct sunlight and expose to ambient light as little as possible.

You need an electric drill and approx. 6mm HSS drill bit

You'll need your own electric drill and a 6mm (approx.) HSS drill bit. Most drills come supplied with a set of these. If you're not sure, Google "HSS drill bit" then hit "images" to see about a million photos of them.

Ignore "Replace with new toner cartridge" message and constant-on red/orange toner light: refill at toner fade out



Just keep printing until you get fade out from actual lack of toner powder in the cartridge: then follow the procedure that starts on page 3. Typical fade-out due to lack of toner develops **progressively** as shown in these three prints





As you keep printing and refilling, keep ignoring light and message

- keep ignoring the toner light, which will be on steady (i.e. not blinking) all the time
- keep ignoring on-screen pop up message "Replace with new toner cartridge" (it goes away by itself).

Starter cartridge and standard cartridge are same for refilling

The machine arrives with a so-called "starter cartridge" already installed in the machine. It's rigged to do only 700 or so prints, whereas the cartridge you're subsequently supposed to buy does in the region of 1,500 prints. As far as the refill technique goes though, the two flavours of cartridge are identical and there's no real need to distinguish between them.

A message that stops you from printing?

At the time of writing, we've refilled and run out a starter cartridge 3 times and a bought cartridge 4 times. Although we saw the message and light behaviour as previously described, at no point were our print jobs prevented.

Experience with recent Samsung printers suggests that there might come a point where, for a particular cartridge, the machine does refuse to print. Because we haven't been able to generate that behaviour ourselves, we looked in our User Guide, which said, "When a toner cartridge has reached the end of life, the machine will stop printing.". And nothing more that we could find.

At the time of writing, if this situation is reached, we don't know of a way around it. In the normal course of events, we'd expect **compatible chips** to become available, and these would be the solution to the problem. If and when compatible chips become available they'll appear under the ML-2160 product listing on our website. Until then, store the cartridge protected from dust and light (the box a bought cartridge comes in is ideal). You'll be able to use the cartridge if and when compatible chips become available.



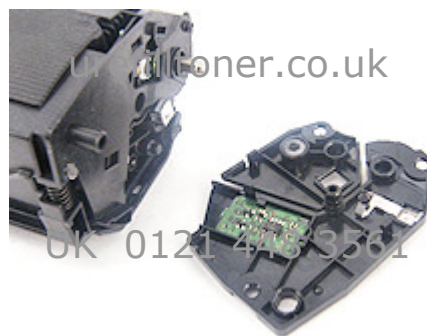
How to refill it

- 1) Identify end of cartridge by green and brass colours of partially hidden chip



- 2) Use a 6mm drill to drill away 3 plastic rivets.

It can be tricky to get the drilling path started, although there is a certain pressure and steadiness of hand that gets the drill to "bite". If you're having problems, try first drilling a "pilot hole" in the centre of the rivet with a very small drill. Or even melt a pilot hole with a heated nail.



- 3) Use 3mm screwdriver to lever end plate away from cartridge body. It will come off easily if all 3 plastic rivets are drilled out deeply enough

- 4) Remove small compression spring, keep to one side



- 5) Cartridge will now tend to separate in two, but keep the two halves together with hand pressure. Remove plug by pushing out on flange with screwdriver. Use fingers as soon as possible to avoid damage to plug. **Care: do not force screwdriver down side of plug.** Push end of screwdriver between plug flange and cartridge body. Use leverage pushing out on flange of plug to loosen plug slightly.

- 6) Shake toner bottle hard for a count of 5 before opening.

- 7) Open toner bottle and screw spout on. Wrap any kind of tape around neck to avoid all leakage of micro fine toner.



8) Hold cartridge at 45 degrees with one hand. Use other hand for bottle.



9) Keeping bottle below horizontal, bring spout to hole and up-end bottle. Bring cartridge and bottle to vertical. Jam spout firmly into hole.

10) Count to 5 while toner flows in.

11) Keeping spout near hole, rotate bottle down to below horizontal.

12) Cover end of spout firmly with finger and briefly shake bottle again. Repeat shake/pour until you can feel there's no toner in bottle when shaken.

13) Replace plug.

14) Wipe excess toner from around plug end of cartridge and shake over white paper to check for a leak. We try to avoid damaging inside seal of plug by pushing outwards on flange only, but if you do get a leak, just seal with bathroom sealant or Copydex.

15) Replace both small compression spring and end plate making sure end plate is pushed right up flush against cartridge body.



As long as end plate is pushed on firmly there's no need to fix it into position. As soon as it's back in the machine, the plate is held firmly in place. But be aware that the end plate isn't fixed on and that it could be a source of problems if it worked loose.



No waste issues for at least 4 refills

The cartridge collects waste toner in a compartment which, eventually, fills up and causes print problems. The symptom of waste overflow is grey "skid marks" vertically down one section of the page.

12pt Times New Roman. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party.

12pt Bold Times New Roman. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party. The quick brown dog jumped over the lazy dog. Now is the time for all good men to come to the aid of the party.

If you seem to have that, you can empty the waste as shown in the next section.

For the ML-2160, waste overflow is unlikely to happen within 4 refills and run-outs. We successfully completed 4 full refills of the bought cartridge without any waste overflow symptoms.

As you refill beyond 4 refills, you might get into waste overflow territory. If you do get skid marks, you need to empty the waste straight away if you're going to because the compacted toner will soon permanently scratch the OPC drum.

We say "if you're going to" because emptying the waste is inevitably more messy than just refilling: so it's a personal choice if you want to do it or not.

How to empty the waste

Special safety note: if you choose to use a vacuum cleaner, we're obliged by law to mention that we're aware of an alleged risk of explosion, allegedly related to some vacuum cleaner designs. Please refer to section 5 of the safety information section.

1. Get a melting tool from urefilltoner.co.uk (in the manufacturer list, choose "Sundries", then click "Sundries" again.)



2. Melt hole as shown.
3. Shake waste straight into an outside bin. Don not expose the OPC drum to direct sunlight.
4. Carefully clean up outside of cartridge with slightly damp cloth. We habitually use a vacuum cleaner with the "hairy attachment" on, but please make your own risk assessment consequent to foreseeable risk identified in this section and our safety information.
5. Clean surface around hole as much as possible with absorbent paper.
6. Seal hole with any wide tape.

Don't update your firmware

The cartridges contain chips. The way the machine responds to chips can be modified by updating the firmware. Do not allow the machine to update firmware across the internet. Disable any default options to do this. It could re-program your machine to behave differently from the way we've described. I.e. your machine might stop allowing multiple refills without needing to change the chip.



Safety Data ML- type toner

Not to be used by children. Avoid inhalation of product. Avoid eye and skin contact. Do not ingest. Avoid sources of ignition while pouring and at all times.

1 Identification of the substance and the company

Product name	Samsung ML-2160 type refill toner
Part no.	SA2160BOT
Supplier	U Refill Toner Ltd. Contact details as per page header

2 Hazards identification

Acute health effects	N/A
Skin contact	Slight irritation
Eye contact	May cause irritation by mechanical abrasion
Inhalation	Irritation to respiratory tract
Ingestion	Unlikely when used as intended. Acute oral toxicity is believed to be low
Potential health effects	
Routes of exposure	Skin contact, eye contact and inhalation. Ingestion unlikely.
Chronic health effects	Prolonged inhalation of excessive amounts of any dust may cause lung damage. Treat as nuisance dust.
Carcinogenicity	Carbon black is classified by IARC as group 2B (possible human carcinogen), but inhalation tests using a typical toner showed no association between toner and animal tumours.

3 Composition

Ingredients	CAS No.	Weight(%)
Polyester	Proprietary	>82
Carbon black	1333-86-4	<8
Polypropylene	9010-79-1	<4
Iron oxide	1317-61-9	<4
Silica	67762-90-7	<2

4 First aid measures

Inhalation	Move person to fresh air. Obtain medical assistance
Eye contact	Flush with plenty of low pressure water for at least 15 minutes. Do not rub eyes. Remove contact lenses to ensure thorough flushing.
Skin	Wash with water, obtain medical attention if ill effects occur
Ingestion	Rinse out mouth with water. Seek medical advice

5 Fire fighting measures

Flammability classification	Slight
Hazardous combustion products	Carbon monoxide and carbon dioxide
Extinguishing media	Water, dry chemical, carbon dioxide or foam
Special fire fighting procedures	Avoid inhalation of smoke. A self contained breathing apparatus and suitable protective clothing should be worn.
Unusual fire & explosion hazards	Toner is a combustible powder; formation of an explosive dust-air mixture is possible. Avoid all ignition sources if toner has been dispersed in air.

6 Accidental release measures

Spill/leak procedure	Sweep up or vacuum spilled toner and transfer into sealable waste container. Sweep slowly to minimize generation of dust. If vacuum is used, the motor must be rated as dust tight and safely applicable to the vacuuming of toner dust. Residue can be removed with soap and cold water. Garments may be washed or dry-cleaned after removal of loose toner.
Environmental precautions	Do not flush into surface water or sanitary sewer systems. Dispose of waste material in accordance with all applicable laws.

7 Handling and storage

Handling	Keep containers closed when not in use. Handle and open containers with care. Use with adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Keep away from sources of heat, sparks and open flames.
Storage	Store at room temperature in the original container. Keep container tightly closed and dry. Do not store with strong oxidizers.

8 Exposure controls and personal protection

Personal protective equipment	
Eye / face	Wear dust resistant safety goggles if there is danger of eye contact
Hands / skin	Wear protective gloves
Respiratory protection	Wear approved respirator for dust when exposure exceeds permissible limits
Additional measures	Use in a well ventilated area. Use engineering controls to reduce air contaminants to permissible limits. Wash hands after use.

9 Physical and chemical properties

Appearance and odour	Fine powder. Slight odour
Solubility in water	Negligible
Solubility in organic solvents	Soluble in some solvents
Specific gravity (H2O = 1)	1.3

10 Stability and reactivity

Stability	Stable under normal storage conditions
Conditions to avoid	Heat, flames, sources of ignition. Keep dust away from ignition sources.
Hazardous decomposition products	Carbon dioxide, carbon monoxide, Nox
Hazardous polymerization	Will not polymerize
Incompatible materials	Strong oxidizers

11 Toxicological information

Oral toxicity	Believed to be low
Inhalation toxicity	No data
Eye irritation	Not classified as irritant according to OSHA HCS and EU 67/548/EEC as amended
Sensitization	Not classified as sensitizer according to OSHA HCS and EU 67/548/EEC as amended
Carcinogenicity	Carbon black is classified by IARC as group 2B (possible human carcinogen), but inhalation tests using a typical toner showed no association between toner and animal tumours.
Mutagenicity	Negative (AMES test)

12 Ecological information

Not tested for ecological effects



13 Disposal considerations

Collect into tightly sealed containers. Dispose of waste in accordance with all local laws. Do not throw in open fires in order to prevent risk of dust explosion.
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14 Transport information

General	Not known to be specifically listed
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Notice. All safety information is given to help facilitate the safe use of this product and is based on information obtained from the manufacturer. This information is believed to be correct, but does not purport to be all-inclusive and shall only be used as a guide. U Refill Toner Ltd makes no warranty, express or implied, as to the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions and / or compliance with local laws and regulations.

All information offered is believed to be true and is offered for consideration in good faith. However, U Refill Toner Ltd gives no warranties, neither explicit nor implicit as to the completeness or accuracy of any information offered nor the ultimate safety of refilling toner cartridges in any manner described or suggested nor the ultimate safety or hazardousness of products supplied by U Refill Toner Ltd. The onus is on the purchaser to evaluate all possible risk, including the possible incompleteness or inaccuracy of currently available information, and by proceeding to use the refill product or products, the purchaser thereby assumes all risk of peril or injury howsoever arising.

If you the purchaser decide not to go ahead with refilling for whatever reason, simply return the product or products to U Refill Toner Ltd and we will cheerfully refund your money. Your statutory rights are unaffected.



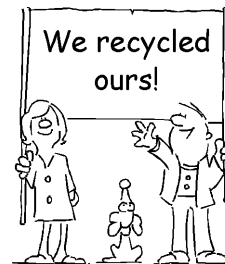
Please, tell three people what you've done



OK, we admit it. This is our begging act. Have you saved money by using our DIY kit? Did you feel a touch of pride as your cartridge *did* print again? Maybe you found some environmental satisfaction? Or perhaps you feel it should be refilled "because it's there".

We sincerely hope we've helped float your boat in some way. And if so, then please help our voice in the wilderness and tell at least three people about what you did with your empty cartridge. Why not send a link to urefilltoner.co.uk to some friends you know have printers?

The phrase "carbon footprint" hadn't been coined in 1992 when we started selling our trend-bucking "guerrilla re-cycling" products. Refilling with just toner **more or less halves CO₂** compared with making the toner plus the whole structure of a cartridge to put it in*.



We're asking for your support to create a kind of benign chain-reaction effect. Yes, we stand to make money from that, but we believe that the battle to reduce CO₂ output does have to be commercialised. That's to say, when the capacity of individuals to make voluntary self-sacrifice reaches a limit, what will take up the slack? In the same way that carbon big-foot companies need money to keep doing what they do, so does a carbon twinkle-toes.



Environmental organisations make us aware of a pyramid of priorities. **Re-use**, in the sense of directly using a resource again, is more beneficial than re-cycling (normally taken to

imply an industrial process such as re-pulping paper fibre).

So, one last time for the planet, please advocate urefilltoner.co.uk if you feel our existence is preferable to our non-existence. Keep refilling in the free world.

*Sources:

Dr. M. Gell, "Carbon Footprints and Ecodesign of Toner Printer Cartridges", Xanfeon Energy & Environmental Services, UK, 2008. Dr. Gell calculates a 52% reduction in carbon footprint by refilling a cartridge 3 times and replacing the OPC drum once. We think the DIY refill case is even more favourable because the following carbon loads included in Dr. Gell's assumptions don't apply: manufacture/transport of replacement OPC drum, triple transport of empty cartridge to remanufacturing facility and energy consumed during remanufacturing at facility. In addition, the footprint of the delivery transport is smaller because toner weighs only a fraction of a whole cartridge.

Centre For Remanufacturing & Reuse (commissioning body), "The Carbon Footprint of Remanufactured Versus New Mono-toner Printer Cartridges". The authors conclude that, based on their data, a remanufactured mono (i.e. black & white laser printer) cartridge has a "46% lower carbon footprint than a corresponding new cartridge".

Berglind & Eriksson, "Life Cycle Assessment of Toner Cartridge HP C4127X", University of Kalmar, Sweden, 2002. The authors state (Abstract page I) that from the point of view of environmental load, "the re-use alternative is full measured two times better ...". Although they point out that the main environmental load is, in fact, associated with paper.

Refills by you ... thanks to you

Thanks for refilling the toner cartridges in your printer. We invented "do-it-yourself" toner refills in 1992, "melt & pour" in 1996 and put "unplug & pour" into internet-speak in 2002. We've never tried to patent or otherwise restrict the use of these ideas.

If you liked our product, please recommend us to friends and colleagues. We've survived for over 20 years – fighting giant corporations that dwarf us – thanks to your custom and recommendation. No one here takes that, or you, for granted.

U Refill Toner. Now needed more than ever. Now refined more than ever.

- ✓ more than halve the cost
- ✓ halve CO₂
- ✓ defend your consumer choices and right to reuse

URefillToner
.co.uk



Original and largest selling
do-it-yourself toner refill

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