

Samsung SCX-4300 refill instructions

Before use, familiarise yourself with the safety data on pages 4 and 5.

Take maximum care when using a screwdriver as a lever: consider measures for protection and avoidance of injury to eyes and hands.

Starter cartridge and standard cartridge are same for refilling

The machine arrives with a so-called "starter cartridge". It has less toner in than the standard cartridge that you buy (code MLT-D1092S/ELS) and so prints less copies. As far as the refill technique goes though, the two flavours of cartridge are identical.

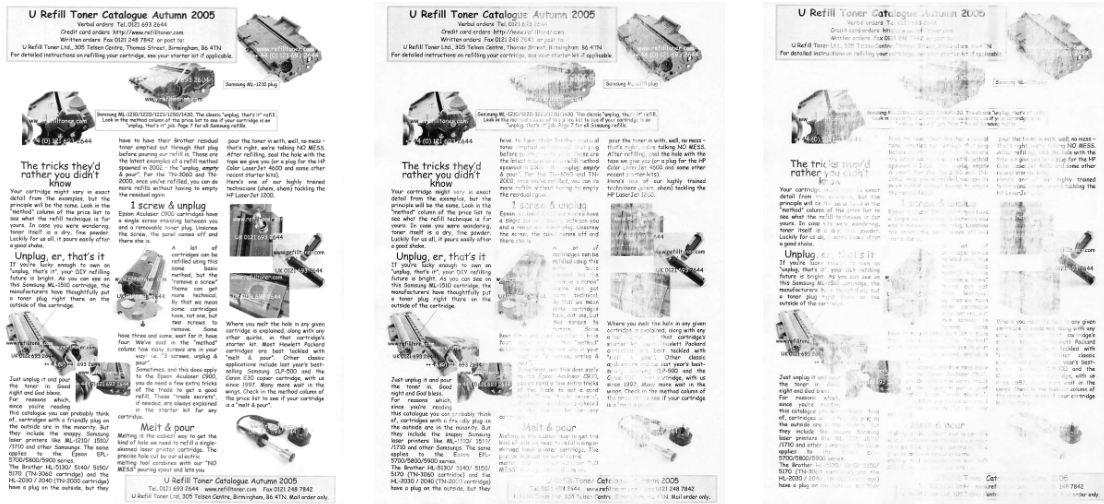
Ignore messages, refill at fade out point only

Ignore all pop-up messages on your computer screen and all messages on the machine itself. Just keep printing until you get fade out from actual lack of toner powder in the cartridge.

Progression of messages when you run a cartridge

On machine's display panel	Pop-up on computer screen	What you do
Toner Low	Toner is low etc.	Ignore. Carry on printing. Override popup if necessary by clicking on X top right of pop-up
Toner Empty	Toner empty. Replace toner	Ignore. Carry on printing. Override popup if necessary by clicking on X top right of pop-up

In all the cartridges we tested, fade-out happened after we'd passed through the above messages. Typical fade-out due to lack of toner develops **progressively** as shown in these three prints.



As you can see, the faded area gets wider and more pronounced with each print, but even on the last very faded page, the print at the edges is still the same blackness as on the first print. If you take out the cartridge and give it a shake at this point, perfect print will return for a few more prints – but then the fade out will return again. This pattern of progressively widening fade out bands which can be temporarily cured by shaking is the hallmark of toner exhaustion.

Weighing can confirm fade-out

If you've got some scales, an empty cartridge (either type) weighs close to **630g**

Starter cartridge: 3 refills allowed by printer logic

Standard cartridge: 5 refills allowed by killer chip

We've confirmed that the machine allows 3 refills of the starter cartridge and 5 of the standard cartridge. This behaviour is controlled by a mixture of hard-coding in the machine and interaction with a chip in the case of the standard cartridge. You might get more refills than stated if you tend to print pages with a lot of toner on them. You might get less than we state if you print a lot of very sparse pages with very little toner on them.

Thing that stops the refill party is the "Toner Exhausted" message shown below. You cannot print beyond this without replacement chips, which at the time of writing don't exist.



How to refill it

Important. Has the cartridge been run to fade out? Don't refill unless it has. See page 1 "Ignore messages, refill at fade out point only".

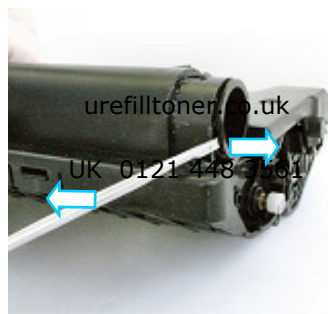
1. Identify end of cartridge by layout of features and remove 2 screws.



2. Lever and slightly push end-plate away from cartridge body
3. Lever end-plate off from other side.



4. 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.



5. Lever out on plug flange in different places until plug has visibly come out some way. Pull plug out with fingers.
6. Shake toner bottle hard for a count of 5 before opening.
7. Open toner bottle and screw spout on. Wrap tape around neck to avoid all leakage of micro fine toner. "Duct tape", also known as "Gaffa tape" is best, but any wide tape will do.
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.



10. Count to 10 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. Reverse your steps to replace end plate.

Waste?

The Samsung SCX-4300 is part of a recent breed of "wasteless" toner systems. You don't have to worry about waste toner.

Three refills, and maybe then some

If you've delved into our website, you might know that we "put our corporate neck on the chopping block and say that the rule of thumb is **three refills, and maybe then some**".

As far as problems due to "wear and tear" go, the SCX-4300 is an "and then some" cartridge. We actually got 6.4 refills out of our first standard cartridge. And even then, it would probably have carried on if we'd had a compatible chip to put in it.

Of course, some cartridges inexplicably give up the ghost early, probably due to small manufacturing imperfections. Others perform above and beyond the call of duty.

By aware though, that the more times a cartridge has been refilled, the more likely it is to fail for one kind of wear and tear related issue or another. We could write a moderately sized book about the different ways a toner cartridge can fail and what the associated symptoms are. Instead, here's another rule of thumb that'll save you most of the headaches we've had since 1992:

If you've got any kind of persistent print problem that boils down to toner being present on the page where you don't want it (i.e. not an *absence* like fadeout), then it's about the end of the road for that cartridge.

A flip side to this is: don't refill a cartridge that has a "toner where it shouldn't be" print problem thinking more toner will fix the problem. On the contrary, at best, you'll just be able to print the undesired behaviour for much longer!

3 and 5 refills (starter and standard cartridge) is pretty good going, so the jury's out on whether or not compatible chips will be developed for the SCX-4300 in the future.

Safety Data Samsung SCX-4300 type toner powder

Not to be used by children. Avoid inhalation of product. Avoid eye and skin contact. Do not ingest. Take maximum care when using screwdriver as a lever: consider measures for protection and avoidance of injury to eyes and hands.

1 Identification of the substance and the company

Product name	Samsung SCX-4300 refill toner
Part no.	SA4300BOT
Supplier	U Refill Toner Ltd. Contact details as per page header

2 Hazardous components

Toner is regulated under OSHA as particulate not otherwise regulated.

Ingredient name	CAS No.	%	OSHA PEL	ACGIH TLV	OTHER LIMITS
Polyester resin	Trade secret.	>82	Not listed	Not listed	
Carbon black	1333-86-4	<8	3.5mg/m ³	3.5mg/m ³	
Polypropylene	9010-79-1	<4	Not listed	Not listed	
Iron oxide	1317-61-9	<4	Not listed	Not listed	
Amorphous Silica	67762-90-7	<2	Not listed	Not listed	

3 Hazards identification

Primary entry routes	Inhalation
Target organs	N/a
Acute effects	N/a
Inhalation	Slight irritation of respiratory tract
Eye	Dust may cause irritation by mechanical abrasion
Skin	Slight irritation
Ingestion	Oral toxicity is believed to be low
Carcinogenicity	Carbon black is reclassified as a group 2B by IRAC, but inhalation tests using a typical toner showed no association between toner and animal tumors.
Medical conditions aggravated by long-term exposure	Accumulation of dust in the respiratory system may cause congestion
Chronic effects	If these materials are used in a manner that could generate airborne particles (dust), it is recommended that the dust be treated as NUISANCE PARTICULATE according to the American Conference of Government Industrial Hygienists (ACGIH)(TLV=10mg/m ³)

4 First aid measures

Inhalation	Move the exposed person to fresh air at once. Treat any irritation symptomatically. Get medical attention if any discomfort continues.
Skin contact	Wash the skin immediately with soap and water.
Eye contact	Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eyelids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.
Ingestion	No adverse effects anticipated by this route of exposure incidental to proper handling.

5 Fire fighting measures

Flammability classification	1 slight (HMIS, NFPA)
Extinguishing media	Water fog, dry chemical, foam, carbon dioxide, foam
Special fire fighting procedures	Avoid breathing fire vapours
Unusual fire & explosion hazards	Non-flammable, but when suspended in air is combustible as with most organic powders. Generates massive smoke during fire. Fire causes formation of toxic gases. Do not release runoff from fire control methods to sewers or waterways.
Hazardous combustion products	Carbon monoxide, carbon dioxide, nitrogen oxide and smoke. Under certain conditions some aliphatic aldehydes and carboxylic acids may form.

6 Accidental release measures

Small spills	Scoop into container for disposal, suction up remaining material with high efficiency vacuum cleaner
Large spills	Scoop into container for disposal, suction up remaining material with high efficiency vacuum cleaner
Containment	For large spills, avoid suspending particles, collect for later disposal. Do not release into sewers or waterways.

7 Handling and storage

Handling precautions	Keep containers closed at all times. Avoid creating dust. Keep away from ignition sources.
Storage precautions	Keep in cool, dry, ventilated storage and closed containers.

8 Exposure controls and personal protection

Protective equipment	Wear chemical protective gloves, boots, aprons and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or safety goggles.
Process control measures	Use engineering controls to reduce air contamination to permissible exposure level
Ventilation	Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (sec 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling at its source.
Respiratory protection	Seek professional advice prior to respirator selection and use. Select respirator based on its suitability to provide adequate protection for given working conditions, level of airborne contamination and presence of sufficient oxygen. For emergency or nonroutine operation, wear an SCBA.
Contaminated equipment	Separate contaminated work clothing from street clothes. Launder before re-use. Remove

Comments	this material from your shoes and clean personal protective equipment. Never eat, drink or smoke in work areas. Wash at the end of each work shift and before eating, smoking, applying cosmetics and using the toilet etc.
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9 Physical and chemical properties

Appearance and odour	Black free flowing powder, faint odour
Solubility in water	Negligible.

10 Stability and reactivity

Stability	This is a stable product
Conditions to avoid	N/A
Hazardous polymerisation	Will not polymerise
Hazardous decomposition products	CO and Nox (by heat and fire)
Chemical incompatibilities	Oxidizing materials

11 Toxicological information

Mutagenicity	Negative (estimated from the results of testing the constituent components)		
Carcinogenicity	In 1996 the IARC re-evaluated carbon black as GROUP 2B. The latter is based upon the development of lung tumors in rats receiving chronic inhalation exposures to free carbon black at levels that induce particle overload of the lung. A two-year cancer bioassay using a typical toner preparation containing carbon black demonstrated no association between exposure and tumor development in rats.		
Chronic effects	In a study in rats (H. Muhle) no pulmonary changes were observed in the lowest exposure group (1mg/m ³), the most relevant level to potential human exposures.		

12 Ecological information

Ecotoxicity	N/a	Environmental degradation	N/a
Environmental fate	N/a	Soil absorption/mobility	N/a

13 Disposal considerations

Disposal methods	Waste material may be incinerated or recycled for iron oxide content. Dispose of in accordance with Local Authority requirements.
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14 Transport information

General	Not regulated
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15 Other information

The information in this data section was obtained from sources which we believe are reliable. However, the information is provided without any warranty express or implied regarding its correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

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.

Assumption of risk notice

We ourselves have no hesitation in researching and refilling cartridges using the method illustrated in this document. However, the company gives no warranties, neither explicit nor implicit, as to the ultimate safety of the procedures described. Any activity or process has an element of risk. The onus is on you, the purchaser, to assess any possible risk, including the inaccuracy or incompleteness of currently available information. If you decide not to go ahead, return the product to us and we'll cheerfully refund your money. This offer is additional to your statutory rights.

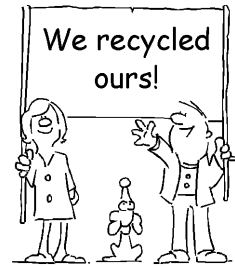


Please, tell three people what you've done

HP, 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:

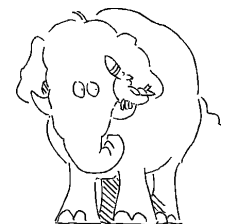
Dr. M. Gell, "Carbon Footprints and Ecodesign of Toner Printer Cartridges", Xanfeon Energy & Environmental Services, UK, 2008. Dr. Gell calculates a 52% reduction in carbon footprint by refilling a cartridge 3 times and replacing the OPC drum once. We think the DIY refill case is even more favourable 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".

Berglund & 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.

Don't forget

Enjoy more "re-use" success with both mono and colour laser printers by OKI, Hewlett Packard, HP, Canon, Epson, Konica Minolta, Samsung and many others. See urefilltoner.co.uk for details.



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