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INVENTING A BETTER FUTURE FOR YOU

iWash™ Slide Cleaner User Manual

Version 1.0
August 2019

Invented, Designed and Manufactured in the UK by Imrali Inventions Ltd

For more information, demonstration videos and E-User Manual
Please visit
www.swiftanalytical.com

! Please read this manual in detail before use, and retain for future reference !

Contents

Thank you for Purchasing the iWash™ slide cleaner

Thank you and congratulations on purchasing the iWash™ Slide Cleaner. This is a significant step towards a sustainable future for your laboratory. The iWash™ is designed to extend the lifetime of cell counter slides indefinitely, reducing significantly the consumable and disposal costs of performing cell counting studies. The benefits from your purchase will last for the lifetime of the device, helping you to make your research budget stretch further, improving the reliability of your analysis while reducing the environmental impact of your research. We hope that you enjoy the convenience and savings that the iWash™ slide cleaning system will provide, and that your research continues and grows as a result.

Ahmet Imrali
Chief Inventor & CEO

1.0 Declaration of Conformity

EU Declaration of Conformity (DoC)

Product:	iWash™ Slide Cleaner and Slide Dryer units
Manufacturer:	Imrali inventions Ltd 620B Greenlane, Ilford Essex, London IG3 9SE
Telephone:	0044 7525849142

This declaration of conformity is issued under the sole responsibility of the manufacturer

Object of declaration iWash™ Slide Washer (IWxxx) and Slide Dryer (IDxxx) units.
XXX denotes the type of Slide Washer and Dryer units.
WDxxx denotes iWash™ washer and dryer units provided together.
IWxxx denotes iWash™ Slide Washer unit only.
IDxxx denotes iWash™ Slide Dryer unit only.

The object of the declaration described above is in conformity with the relevant Union Harmonisation Legislation:

Low Voltage Directive	2006/95/EC	(until 19 April 2016)
	2014/35/EU	(from 20 April 2016)
EMC Directive	2014/30/EU	
RoHS Directive	2011/65/EU	(until 21 July 2019)
	2015/863/EU	(from 22 July 2019)

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity declared:

IEC/EN 61010-1:2010+A1:2019	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements.
IEC/EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use. EMC requirements. Part 1: General requirements (Class B).

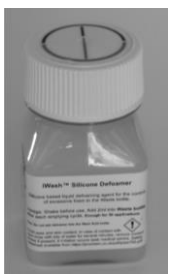
Additional information: None

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable Essential Requirements of the Directives. The Technical Construction File required by this Directive is maintained at company headquarters of Imrali inventions Ltd., 620B Greenlane, Ilford, Essex, London, IG3 9SE.

Signed for and on behalf of: **Imrali inventions Ltd**
Name: **Ahmet Imrali** Position: **CEO & Chief inventor**
Email: **a.imrali@imraliinventions.co.uk**
Telephone: **07525849142**

Place of issue: **United Kingdom** Date of issue: **01/07/2019**

1.1: Packing List

Part Description	Image
Washer Unit	
Dryer Unit	
Concentrated Wash Solution (part number WFC 100)	
Concentrated Silicone Defoamer Solution (part number SDF 100)	
Plastic Waste Liquid Reservoir (part number IW Bottles)	

Plastic Wash Liquid Reservoir (part number IW Bottles)	
Universal power supply	
Slide storage Pouch (pack of 5)	

Four types of safety alerts may appear in this manual at points where you need to be aware of relevant hazards. Each alert word—**IMPORTANT, CAUTION, WARNING, DANGER**—implies a particular level of observation or action, as defined below:

IMPORTANT! – Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

CAUTION! – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING! – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

DANGER! – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Except for **IMPORTANT!** safety alerts, each safety alert word in this manual appears with an open triangle figure that contains a hazard symbol.

1.2: Safety Instructions

⚠ **WARNING!** Do not install the instrument in high humidity environments such as a greenhouse or an incubator to avoid the danger of electric shock. If water or other material enters the instrument, the adaptor, or power inlet, disconnect the power cord and contact a service person. For operating environment, refer to **Product Specifications.**

1.2.1: Electrical Safety

⚠ **WARNING!**

- Do not touch the mains plug or power cord with wet hands. Always ensure that the power supply input voltage matches the voltage available in your location.
- Do not install the instrument in heavy humidity such as a greenhouse or an incubator to avoid a
- danger of electric shock. If water or other material enters the power adaptor, disconnect the power cord and contact a service person. For operating environment, refer to "Environmental Conditions" (1.3.1 page 7).
- Use only the provided power supply unit specific for the washer.
- Plug the power cord firmly into the wall outlet and AC adapter.
- To avoid potential shock hazard, make sure that the power cord is properly grounded.
- Be sure to position the equipment such that it is easy to disconnect the instrument.
- Turn off the instrument before unplugging the power cord and/or moving the instrument.

1.2.2: Emergency Switch Off

⚠ **WARNING!**

- If the instrument is damaged, disconnect the power cord and contact a service person. **Do not disassemble the instrument.**
- If the instrument emits smoke, disconnect the power cord from the wall outlet and contact a service person.

1.2.3: Intended Use

⚠ **CAUTION!**

- Do not install the instrument on a slant or a place prone to vibrations; this increases the risk of instrument malfunction or damage.
- The iWash™ slide cleaner is designed to clean plastic slides compatible with the Nexcelom® cell counter, the Biorad TC20®, Invitrogen Countess II®, NanoEntek's Eve® and Arthur®, Logos Biosystems Luna®, Luna II® and Luna® Fluorescent Cell Counters, and Olympus R1® cell counters.
- For research use only. Not intended for any animal or human therapeutic or diagnostic use.

1.2.4: Chemical Hazards Warning

⚠ **CAUTION!**

- Before handling any chemicals, refer to the Safety Data Sheet (SDS) provided by the manufacturer, and observe all relevant precautions.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the Safety Data Sheets (SDS).
- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

1.3: Product Specifications

1.3.1: Environmental Conditions

Operating Power:	100–240 VAC, 1.5 A
Frequency:	50/60 Hz
Electrical input:	12 VDC, 3.0 A
Installation site:	Indoor use only
Operating Temperature:	10–35°C
Maximum Relative Humidity:	20–80%
Altitude:	<2,000 m
Transient Category:	Installation categories II
Pollution Degree:	2
Degree of Protection:	IPX0

1.3.2: Wash Unit Specifications

Instrument Type:	Benchtop Slide Washer
Washing Time:	12 seconds
Instrument Dimensions:	22.5cm (w) × 25.5 cm (L) × 13 cm (h)
Weight:	2 kg (dry)

1.3.3: Dryer Unit Specifications

Instrument Type:	Benchtop Slide Dryer
Drying Time:	5-10 seconds
Power Consumption:	12V 1A power consumption
Air Pump Specification:	12L/min airflow diagram pump
Dimensions:	5cm (w) x 15cm (L) x 15cm (h)
Weight:	0.8kg (dry)

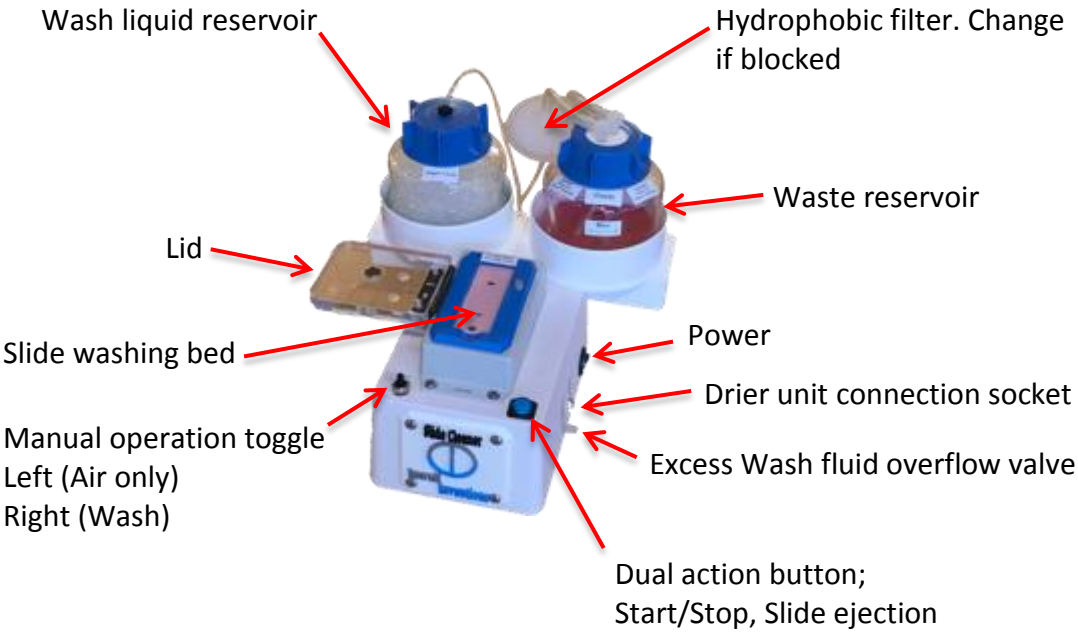
1.4: Summary of Parts

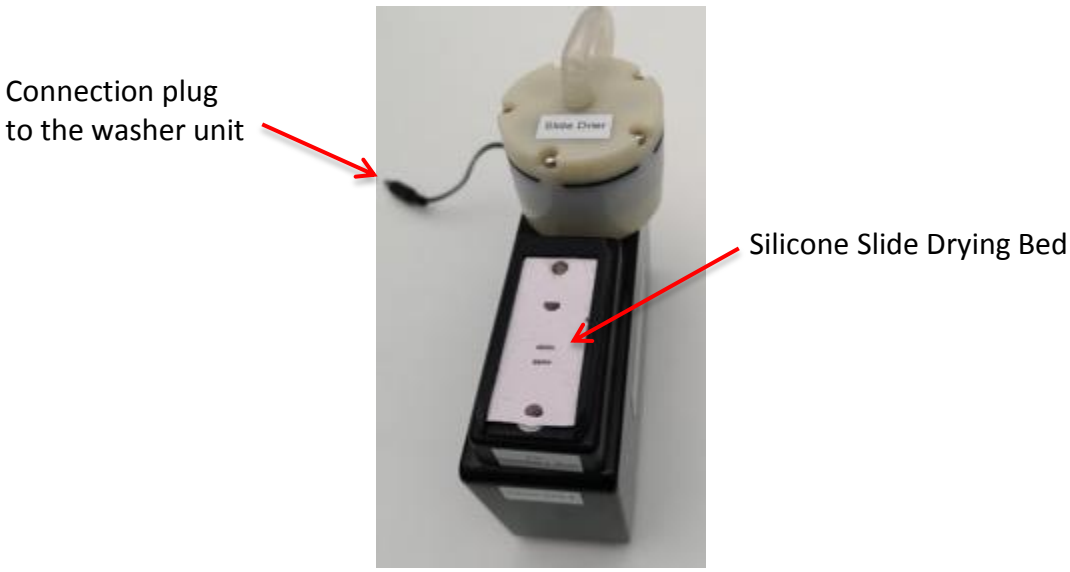
The iWash™ slide cleaner is an easy-to-use, service free cell counter slide cleaning device.

Note: It is recommended that slides are cleaned within 30 minutes of use. Do not allow cell samples to dry within the slide cavity.

CAUTION!

Please wear appropriate personal protective equipment whilst operating the iWash™ at all times





1.5: Operating Procedures

1.5.1: Washer Setup Procedure:

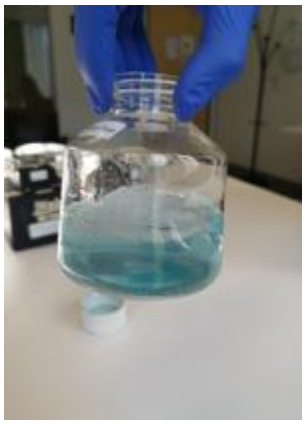
1. Remove all external packaging and check components against the parts list

2. Plug the iWash™ power cable into the country specific wall socket (12 VDC, 3.0 A).

3. Connect drier unit via cable into drier unit connection socket. Switch power switch to “on” position; on/off switch, and LED on dryer unit will illuminate.

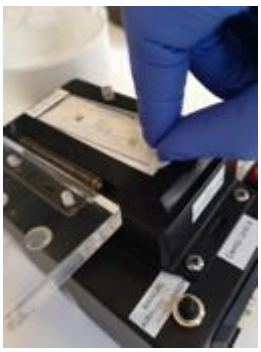
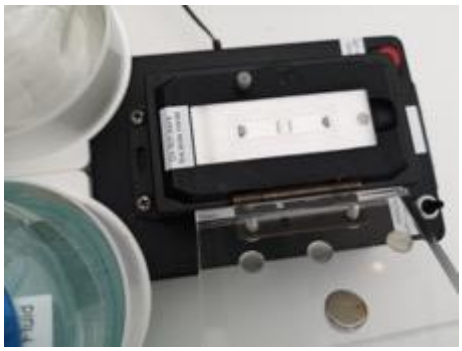
4. Make up wash solution by pipetting 2mL of the concentrated wash solution into the wash solution reservoir, then add ultrapure water to 200ml and swirl to mix. Screw on cap and place in left hand side of the white bottle holder.



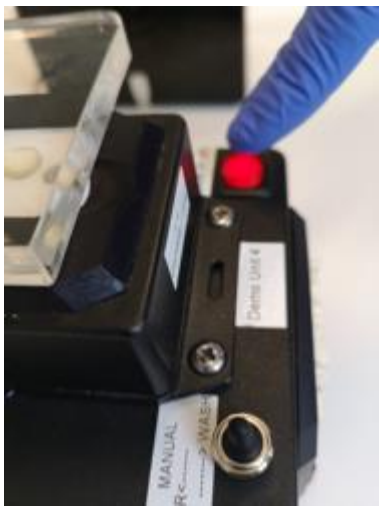



5. Pipette 2ml of silicone defoamer solution into the waste reservoir, then screw on the cap until it is airtight and place in right hand of the white holder.


6. Open the lid and place a slide with the chamber side down onto the silicon surface of the slide washing bed. **The holes on the slide should face downwards onto the silicon surface**. Make sure the slide is flush within the chamber. If it is not flush, the system will not operate.

7. Close the lid and push the manual operation toggle switch right to draw washer fluid through the system until the foamed wash fluid begins to collect in the waste bottle. Alternatively pressing the dual action button to initiate and run 3 consecutive wash cycles will allow wash fluid to fill in the internal pipes of the washer.

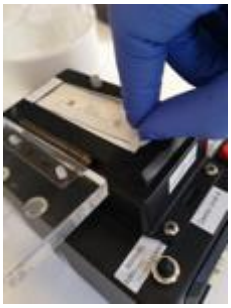
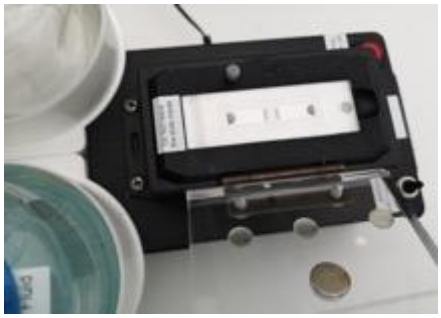




8. Load 10µL trypan blue into the slide cavity, and perform a full wash cycle as detailed in sections 1.5.2 and 1.5.3. Check there is no residual coloured fluid left on the slide. This will confirm the system is correctly set up and ready for use.

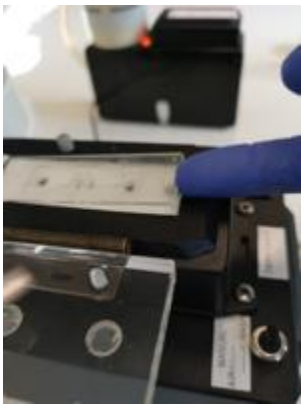



1.5.2: Automated Washer Operating Procedure:

1. Place new or used slide rough side down onto the silicon surface of the slide washing bed **Important: The holes on the slide should face downwards onto the silicon surface. Make sure the slide sits flush within the chamber.**

2. Close lid- which will close firmly with the help of built in magnets causing lid to push down slide onto the silicone bed
3. The light of the dual action 'start/stop and slide ejection' button will illuminate to indicate the presence of slide in the silicone slide washing bed when the lid is securely closed.
4. Press and release the dual action 'start/stop and slide ejection' button to start the wash cycle. Note: Pressing the dual action button again during the wash cycle will terminate the wash cycle. Also opening the lid during wash cycle will immediately stop the washer. Once the washer is stopped for the above reasons, the wash cycle re-sets itself and starts from the beginning when started again.
5. The iWash™ will begin the wash cycle. Wait for an audible beep, then open the lid and remove the slide by pressing the dual action Start/Stop or Release button, or by using the fingernail groove. Note: when the lid is open configuration the light of the dual action button is off and the dual action button now acts as slide

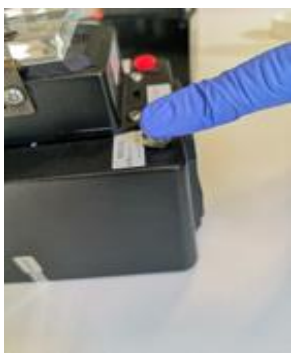


CAUTION! Do not attempt to run the device by over-riding the interlock switches and not having any slides in the slide loader. Any attempt to do this will result in clean wash fluid escaping from the wash fluid overflow pipe located on the right side of the iWash.

1.5.3: Manual Washer Operating Procedure:

The iWash™ is pre-programmed with an optimised washing protocol. If required, slides may also be washed manually by using the manual operation toggle switch.

1. Place new or used slide rough side down onto the silicon surface of the slide washing bed- the holes on the slide should face downwards onto the silicon surface. Make sure the slide is flush within the chamber.
2. Use the manual operation toggle switch to perform desired clean; pushing the toggle switch right will apply air and wash fluid simultaneously. Pushing the toggle switch left applies air alone to remove excess wash fluid.



1.5.4: Dryer operating Procedure:

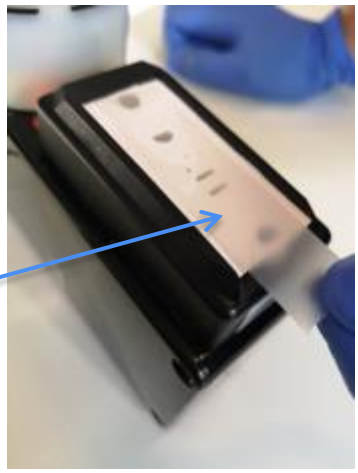
1. Place the cleaned slide rough side down (the holes on the slide facing towards the silicon slide bed) onto the silicon chamber of the slide dryer.

2. Press the slide down simultaneously at both ends to activate the dryer. This will be accompanied by an audible noise of dryer's air pump being activated.

3. Allow to dry for 5-10 seconds
4. Remove excessive moisture from the external surface of the slide by wiping with a lint free tissue or simply wipe through a gloved hand.

1.5.5: Maintenance of the Device:

The silicon base of the slide washing bed and dryer may accumulate dust particles over time. Removal of any dust is the only maintenance required. Place a piece of standard sticky tape over the silicon bed and smooth down. Remove gently, and repeat if required. If liquid cleaning is necessary use only the wash solution provided. Cleaning the body of the washer: do not use strong cleaning agents or any alcohol to clean the external surface of the washer. Instead use dampened cloth to wipe the external surfaces of the washer.



1.5.6: Tips for maintaining the cleaned slides:

- After drying, a small amount of wash fluid may remain on the surface of the slide. Remove this moisture by wiping the slide gently with lint free tissue. Do not wipe the slide with a paper towel, as this may deposit microscopic fibres in the sample inlet holes. This may cause contamination of subsequent samples.

- The optical properties of a slide are crucial to the accuracy of each measurement. It is therefore important to handle slides carefully to prevent scratches or bending altering the refractive index of the slide. Keeping the outside of the slide clean is the responsibility of the user. After each wash, place the slide in a slide pouch as provided to prevent dust accumulation or possible scratching of the slide.

1.6: Troubleshooting:

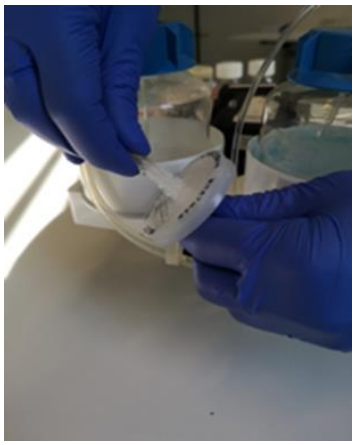
1.6.1: If a fungal growth is observed in the wash fluid bottle:

Empty the bottle; rinse thoroughly with 70% ethanol, then distilled water. Do not allow the ethanol to remain in the bottle for longer than 60 seconds. Make sure distilled water is used to prepare the wash fluid and add 2ml of proprietary iWash Wash Fluid Concentrate per 200ml of wash fluid prepared.

1.6.2: Wash fluid coming out of wash fluid overflow hole:

- This will occur if the airflow through the washer is obstructed.
- Make sure the slide is placed on the wash bed correctly (as described in 1.5.2. Step1).
- Check the hydrophobic filter and make sure it is not blocked. If there is resistance to airflow through the filter then change it.
- Check the waste reservoir lid is closed properly and is airtight.

Changing the hydrophobic filter: Gently and slowly pull away the silicon pipes from the barbed ends of the blocked hydrophobic filter to remove it then place a new hydrophobic filter and pushing the silicone pipes into the barbed ends of the new filter



1.6.3: Visible crystals in the wash fluid:

At low temperatures, or when the wash solution is insufficiently diluted, crystallisation of the wash fluid may be observed. If this happens, bring the wash fluid up to room temperature or dilute further. Use a magnetic stirrer to re-dissolve the crystals until none are visible. If this fails then make up a fresh wash solution. **Do not attempt cleaning with crystallised wash solution.**

1.6.4: Checking the slide after cleaning:

iWash™ is very effective at removing the cells from the slides so it doesn't necessarily need to be checked to see if the slide is cleaned. However, if desired, after wash and drying, the slide can be placed back in the cell counter to obtain the image of the chambers to see if there are any cells remaining.

1.6.5: Evaluating the effectiveness of Slide cleaning by using cell counting function on the washed slide:

When evaluating the effectiveness of slide cleaning after loading the slide with cells and carrying out cell counting it is recommend that, after washing and drying of the used slide, the cleaned slide is then loaded with sterile PBS or distilled water to simulate the presence of liquid in the slide before carrying out cell counting on the cleaned slide. Having a clear liquid in the slide will ensure that the cell counter is correctly focussed inside the chambers of the slide and not focused on the microscopic dust particles on the surface of the slide which may then deceive the cell counter into detecting those particles as dead cells.

1.6.6: Improving cell counting:

Most cells have a diameter between 10-50µM. Small dirt particles or debris are generally smaller than 10µm in size and those particles are detected as dead cells by the cell counter if the correct detection range for the cell size is not set properly. Setting up cell counter to omit particles smaller than 5µm will improve the cell counting by excluding those small particles from the count as false positive dead cells. This is also recommended by a number of automated cell counter brands for improving the cell counting accuracy for their cell counters such as Countess II™. We also recommend that if possible, the cell counter to be set to omit particles smaller than 5µM in size. This will also improve the cell counting accuracy for the washed slides.

1.7: FAQ's

Do the waste materials in the bottles require specialist disposal methods?
The wash fluid contains quaternary ammonium compounds as an effective disinfectant in order to prevent microbial growth in the wash fluid. The wash fluid will also deactivate cells together with bacteria, fungus, algae and viruses which might be collected in the waste bottle as a result of washing used slides.
Therefore, no specialist disinfection or disposal methods are required for the waste.
Please do not place any additional disinfection material in the waste bottle such as Virkon, Distell etc. The strong concentration of those chemicals will eventually corrode the waste bottle.
Should an additional disinfection method be required it is recommend to treat the waste with other generally used strong disinfectants (4% Virkon, Distell solution etc.) in a separate beaker or container before discarding the waste appropriately.

Does the cleaning change the refractive index of the slides and is this important?
Washing a slide with the proprietary water based wash fluid as provided does not cause any physical or structural change to the slide at all. Any change in the refractive index of the slide does not affect the detection of the cells in the slide and is not considered a significant issue.

Is the concentration of detergent used hazardous/toxic?
The wash fluid concentrate is a highly concentrated solution and contains quaternary ammonium compounds as a microbiocidal and is considered to be hazardous. It is biologically degradable and causes no serious or long lasting damage to the environment. Always use appropriate personal protective equipment and read the safety instructions provided. Once diluted 1/100 in distilled water to make the wash fluid solution, the potential toxic and hazardous effect is dramatically reduced.
As a precaution always exercise care when handling. If the solution comes in contact with the eyes or skin, wash with copious amounts of water and seek medical attention.

How stable is the washing solution?
Prepared Wash fluid is stable at room temperature as long as it is sterile and does not have any sign of microbial growth. The microbiocidal contained in the wash fluid prohibits the growth of microorganisms however it is recommended that before use the wash fluid is visually checked for the growth of any contaminants. Sterile wash fluid has a clear and transparent colour. If contaminated, the wash fluid will have a cloudy appearance and a fresh solution needs to be prepared.

How many times can a slide be cleaned?
This mainly depends on how well the slide is kept between washes. If the slide is well protected between the washes it should last for at least 50 cycles as this is the extent of the testing so far.
The patent pending direct injection technology of the iWash™ in combination with the gentle wash fluid causes no physical or structural change to the slide even after so many washes.
Using the slide storage pouch to store slides in between washes also ensures the slide is being kept dust free and scratch free for the longest amount of time possible.

Do I need to clean new slides?
Yes. It has been shown that a significant percentage of new slides contain particulates as a result of the process used for manufacturing and so it is good practice to clean all slides before use. Microscopic dust particles or imperfections may be incorrectly detected as dead cells when you place a brand new slide in the cell counter and count the cells on an empty slide. Using iWash™.to clean a new slide takes less than 30 seconds and ensures consistency of analysis.

How do I know when the slide is clean and dry?
The iWash™ slide cleaner is programmed with an optimum wash cycle that is very effective at removing the cells from the slide within seconds. Washing the used slide only once with iWash™ is sufficient to remove all of the cells from the slide. Usually drying a slide for 5 to 10 seconds is long enough to completely dry the slide. Dried slides should have no visible wash fluid residues or foam in its chambers. This can quickly be assessed when the slide is visually checked after drying. Any excess water outside the chambers may be wiped clean with a lint free tissue.

How do I check if my slide is effectively cleaned?
iWash™ is very effective at removing the cells from the slides so you don't necessarily need to check to see if the slide is cleaned. However, if desired, after wash and drying, the slide can be placed back in the cell counter to obtain the image of the chambers to see if there are any cells remaining.

When evaluating the effectiveness of slide cleaning after loading the slide with cells and carrying out cell counting it is recommend that, after washing and drying of the used slide, the cleaned slide is then loaded with sterile PBS or distilled water to simulate the presence of liquid in the slide before carrying out cell counting on the cleaned slide. Having a clear liquid in the slide will ensure that the cell counter is correctly focussed inside the chambers of the slide and not focused on the microscopic dust particles on the surface of the slide which may then deceive the cell counter into detecting those particles as dead cells.

What happens if I have a slide that has cells dried on the surface?
Slides should be washed straight after cell counting while the cell solution is fresh in the slide so it may be easily cleaned. Since it only takes 30 seconds to wash and dry the slide, it is practical to wash the slide after cell counting before re-using or storing.
However if the used slide is not washed straight away and cells have dried in the slide then washing the slide with iWash™ wash fluid may not be sufficient to remove adhered cells from the slide. In this case the special slide recovery solution (part number SRS 10) is needed to effectively remove these fixed cells from the slide. The slide recovery solution is enzyme based and stable at room temperature. Pipette 10µl of the recovery solution into each slide chamber and then leave for 5 minutes at room temperature before washing the slide as normal.

When do I need to change the hydrophobic filter?
The hydrophobic filter will only need to be changed when blocked. Allowing the waste bottle to fill above the max level or not placing silicone defoamer into the waste bottle will cause excessive liquid waste or foam to be sucked through the pipe and block the hydrophobic filter. If this happens the suction and therefore the movement of the wash fluid through inside the chambers of the slide will be restricted. This will result in excessive wash fluid being discarded from the 'excessive wash fluid port' located on the right side of iWash™.

1.8: Miscellaneous

1.8.1: User Assistance:
If you require any assistance, please contact your local distributor.

1.8.2: Decontamination Procedure
If any of the iWash components require general cleaning, apply a small amount of the dilute iWash™ to a lint free tissue and wipe the affected area.
For decontamination before shipment and/or transport: The iWash™ surfaces may be cleaned with solvents, aqueous detergents, and acid/base viricide (such as Virkon S) solutions. Wipe with deionised water after using these cleaning solutions to complete the decontamination process.
If in doubt, please contact your local distributor. If any components need to be returned to your supplier please contact them directly for a decontamination declaration.

1.8.3: Notices
The information contained in this document is subject to change without notice.
Except as specifically set forth in its terms and conditions of sale, Imrali Inventions makes no warranty of any kind with regard to this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.
Imrali Inventions shall not be liable for errors contained herein for incidental consequential damages in connection with furnishing, performance or use of this material.

1.8.4: Copyright Information
This document contains proprietary information that is protected by copyright.

Other trademarks belong to the specific manufacturer where mentioned, i.e. Nexcelom® cell counter, the Biorad TC20®, Invitrogen Countess II®, NanoEntek's Eve® and Arthur®, Logos Biosystems Luna®, Luna II® and Luna® Fluorescent Cell Counters, and Olympus R1® cell counters.

1.8.5: Trademarks

Registered names, trademarks, etc. used in this document, even when not specifically marked as such, are protected by law.

1.8.6: Service Support

Contact your supplier if out of warranty servicing is required. Any subsequent repair if needed will be billed depending on the parts replaced and labour hours at the local rate.

1.9: Instrument Warranty

Imrali Inventions Ltd warrants to the original purchaser ("Purchaser") that the Instrument ("Instrument") will be free from defects in materials and workmanship for a period of one (1) year from the date of delivery. Imrali Inventions Ltd agrees, as its sole responsibility under this limited warranty, and upon prompt notice of a defect, to repair, replace or credit the purchase price, at its discretion, any Instrument discovered to be defective within the warranty period.

Imrali Inventions Ltd will credit the customer within 7 days of purchase, if the instrument is in original condition and **only if the customer would like to return the instrument**. After 7 days, Imrali Inventions Ltd will only repair or replace the instrument for up to a year and no credit will be issued. Imrali Inventions Ltd will not accept any returned instrument that was used in HIV or other infectious disease labs.

This warranty does not include repair, replacement, or refund necessitated by accident, abuse, neglect, misuse, unauthorized repair, or modification of the Instrument. The warranty will be voided if the instrument is disassembled or a customer attempted to repair the instrument. In the event that Imrali Inventions Ltd determines that the Instrument is in need of repair and not replacement, this Standard Warranty includes replacement parts and labor for the Instrument. This Standard Warranty does not include shipment of the Instrument to and from service location or travel cost of service engineer, the costs of which shall be borne by the Purchaser. **This Warranty and the remedies set forth herein are exclusive and in lieu of all other express or implied warranties (including implied warranties of merchantability, fitness for a particular purpose and non-infringement), and no other warranties shall be binding upon Imrali Inventions Ltd. In no event shall Imrali Inventions Ltd be liable for any special, incidental or consequential damages resulting from the use or malfunction of this Instrument or the system with which it is used, even if such damages could be anticipated by Imrali Inventions Ltd.** To obtain service during the warranty period, contact Imrali Inventions Ltd for further instruction.

OUT OF WARRANTY SERVICE

Contact your supplier or Imrali Inventions Ltd. Repair service, if needed, will be billed depending on the parts replaced and labor hours needed to repair your instrument. You will be billed for shipment of the instrument to the recommended service facility.