



Waterfed Pole Systems (WFP Systems) & using them safely in the workplace (Informational Sheet).

As WFP systems are increasingly used for window cleaning & in many cases used for other cleaning jobs in the cleaning industry; here is a safety & user guide for using WFP's in the workplace.

Window cleaning at heights usually of up to 80ft/25 metres high from ground level (& sometimes much higher) & avoiding the need to work at height from ladders or elevated platforms is an obvious immediate attraction, however.. there are various considerations to be taken into account.

The information presented in this sheet presents practical advice to help window cleaners & reduce risks, taking into account the needs of the WFP user. For the purpose of this informational guide, the term waterfed pole (WFP) is defined as a telescopic or extending pole fitted with a brush or cleaning mechanism & a way of delivering purified water up to the window for window cleaning.

The use of purified water is an integral part of the cleaning process. The water treatment system/pure water delivery tank, a backpack/trolley, WFP's & other ancillary accessories such as hose reels, cones, high visibility wear & warning signs are covered in this guide.

To be taken in to consideration:

- Easy access & uncluttered access to building facades.
- Designers & architects of buildings to take in to account window cleaning maintenance & access for window cleaners in all areas & how it would place

window cleaners workers in dangerous areas to perform the maintenance.

- A basic understanding by all; including homeowners, that cleaning windows by WFP will entail that the windows are left wet & that the process may take a few cleans before the standard of cleaning is acceptable. For construction cleaning, this may not be possible.
- That window cleaners will need to learn how to perform WFP cleaning & the challenges of the learning curve this presents, including the extra knowledge base & economic outlay needed as an ongoing concern.
- WFP's are not suitable for all types of cleaning & access could be a problem. The legal changes resulting from the working at height regulations (in 2005) have further enhanced safe practice. i.e. Window Cleaning should be performed from ground level if possible (even cleaning stood on a beer crate is deemed working at height). Window cleaners need to adapt their work method to avoid deaths & injuries if they are to be reduced in the long term.

Avoiding Risk: The use of WFP's, in most cases removes the need to work at height & provides windows to be cleaned that can be assessable from the ground without obstruction.

Although adopting WFP as a cleaning tool, it may remove the risks of working at height, but other dangers can present themselves in its place i.e. other risks come in to play with WFP use. It is important to assess operational risk & consideration must be given to the location of the building, it's obstacles, terrain underfoot, the current weather conditions & overhead power sources including electric on facades of buildings.

The suitability of the operator with regard to their level of fitness & medical history must be taken in to account & identifying any muscular or skeletal disorders that may develop as a result of operating a WFP using poor technique.

Less obvious risks include the consequences of carrying tank systems, static systems & equipment that is heavy, unstable, unsecured or incorrectly installed within a vehicle. Water treatment & water storage is prone to a slight potential for the spread of Legionella disease or Weils disease caused by poorly maintained filter systems or other location factors.

Environmental: Dwellings or buildings on industrial estates & domestic properties usually have different risks than inner city locations. Consideration must be given to the cleaning times & traffic conditions & heavy foot traffic has to be taken in account to prevent public access to your working area & all the equipment you are using.

Warning signs should be prominently displayed (in both directions) to warn of a trip hazard from trailing hoses & a slip hazard sign for wet or slippery surfaces. High visibility clothing should always be worn by operators, especially when near to pedestrian & vehicular traffic.

Consideration should be given to adverse weather conditions. A plan of action should also be given to the needed length of WFP, duration of work & in the event of the WFP being dropped or blown over by wind or a physical body hitting your pole, be it mechanical or by a person. There should be at least 5m of safety room between your WFP & any surrounding dangers.

Hazards usually associated with the use of WFP's include (but not limited to);

- Trip hazards to the general public by trailing hoses from the top end or base of your WFP. In some cases, trailing hose can be in the middle of your pole depending on the model or make-up of a unique supplier system.
- Slip hazards presented from wet pathways & other surfaces that could also be damaged by water. Including winter conditions & the transport & application of sodium grit where ice can be formed. Leaks on equipment from hoses & systems should also be addressed.
- Slip hazards for operators while concentrating on the work at hand. Some have even fallen in to swimming pools, over fences & down holes. This may be funny for onlookers, but it could become a serious event leading to the end of a window cleaning career.
- Falls from height when working from flat roofs, small ledges & steps. Know your surroundings.
- Electrocution from the WFP coming into contact with overhead or a façade power source, including electrified signs & electric cables.
- Injury to others from falling WFP's or part of the construction of a building that may be dislodged i.e. masonry, brick, plaster, ledges & additions to the building that may not have been there when the building was constructed. Or buildings in bad repair.
- Injury to others from falling WFP's caused by incorrect handling, or failure of the WFP itself i.e. clamps, weakened carbon fiber, clamps or cracks in the WFP. In some of the older type clamps, it has been known to pinch skin or sections of the WFP to collapse.
- Injury through incorrect manual handling of poles & other equipment. If other

workers have been using the pure water systems or WFP's, a checklist may be needed before work commences. See other forms within the WCA library concerning Method Statements & Risk Assessments.

- Spread of legionella disease & weils disease through poor maintenance of a pure water system & location of static systems.
- Hazards from conveying fitted tank systems (or otherwise) & equipment that may overload, make a vehicle unstable, unsecured or incorrectly installed within a vehicle, paying special attention to balance of load & bulkheads for the protection of drivers & occupants of a vehicle.
- Safe road journeys to & from the workplace should be subject to a documented risk assessment. Assessment of these risks will include security of the load & position of load to ensure that it does not shift under normal driving conditions, emergency braking or during a collision. Responsibility rests with the driver of the vehicle; however, business owners have a responsibility to provide suitable vehicles, equipment & means of securing the load.

Consideration should also be given to the potential for the overloading of the vehicles fitted with water tanks or loaded with drums containing pure water. When a water tank is full a vehicle is likely to be close to its maximum payload capacity depending on the size of tank. A vehicle that is overloaded cannot be controlled due to tyre flattening. To assess road safety risks consideration should be given to:

- The size & design of the water treatment/delivery tanks.
- The manufacture of water treatment/delivery tanks. Including buffers/vanes inside the tank & vessel wall thickness & grades of plastic.
- The installation/anchorage of water treatment/delivery tanks including vehicle occupant protection (bulkheads).
- The payload capacity of the vehicle & the potential of overloading including drivers weight, other occupants, a full fuel tank, ladders & other equipment.
- The security of WFP's, hose reels & ancillaries etc. that are fixed in, or on the vehicle.
- Driving conditions & braking distances. Design & manufacture of tank systems & equipment should comply with HASAWA 1974 & PUWER. Both professional & self installations in vehicles should meet the requirements of:

- The Road Traffic Act.
- The Road Vehicle (construction & use) regulations.
- The Code of Practice “Safety of Loads on Vehicles”.
- BS: 12195 Load Restraint Regulations.
- Your vehicle insurance company stipulations.

Legionella Bacteria can be found in low levels in most water sources, the presence of a few bacteria is in itself unlikely to cause a problem, it is when they begin to multiply that the risk increases. Legionnaires Disease is caused by ingesting the bacteria.

Legionella requires nutrients to multiply; these can be provided by sediment, scale, sludge & biofilms. These materials build up in the filters that are used to purify water. If maintenance guidelines & filters are not replaced at specified intervals, filters may become a fertile breeding ground for legionella bacteria. Water temperature is of particular importance.

Factor in the survival & multiplication of legionella; when the temperature of water rises above 20 degrees, the bacteria begin to multiply, the optimum temperature being 37 degrees. A water temperature of 120°F does not kill the Legionella bacteria; a minimum temperature of 140°F is required at which Legionellae dies in 32 minutes. The Legionella disinfection range is 158 – 176 °F.

Contracting Legionnaires Disease: The disease is normally contracted after the inhalation of the bacterium in small droplets (aerosols) or in droplet nuclei that are in the residue after the water has evaporated. WFP’s produce aerosols & it should be noted that aerosols are not restricted to the point of production. Under suitable wind conditions, viable Legionellae bacteria can travel up to 500 metres.

Legionella will not normally multiply in cold water systems or even hot water systems when the water is heated at point of use, or when the system is in regular use. However, legionella will multiply when the right conditions exist, these are:

- When sediment, scale, sludge & biofilms build up in filters, in pipes, hoses or tanks.
- When water temperatures rise above 20 degrees (optimum temperature 37 degrees).

Measures that should be taken to control the risk of legionella are:

- Replacements of filters at recommended intervals or on discolouration. Following the manufactures servicing recommendations, if any at all are provided. Hence this document.
- Keeping the system stored in a cool shady place when not is regular use. Using opaque or darker coloured tanks to prevent sunlight from the promotion of bacteria.
- If your system cannot be stored in a cool place, drain the tank & filters whenever the system is to be left idle for more than three days during warm summer months. The release of legionella is also subject to the Control Of Substances Hazardous to Health (COSHH) Regulations 2002. Used filters should be disposed of in accordance with local authority guidelines.
- If you purchase purified water from a supplier, a document should be prominently displayed & visible at point of purchase showing the water is free from legionella & weils disease or attempts to reduce the viability are in place.

Weil's disease is a severe form of a bacterial infection known as **leptospirosis**. The infection typically only causes mild flu-like symptoms, including headaches & chills. In severe cases, such as in Weil's disease, it can lead to organ failure & bleeding.

Leptospirosis is spread to humans by contact with soil or water contaminated with the urine of certain wild animals, including cattle, pigs, dogs, & most commonly rats. The bacteria are typically found in animals, including rodents. Humans become infected when water or soil contaminated with the bacteria come into contact with their eyes, mouth, nose, or open cuts on the skin. It is also possible to become infected through rodent bites & drinking urine laced contaminated water. Freshwater fishermen & other water workers are at a higher risk of contracting leptospirosis.

Measures that should be taken to control the risk of Weils Disease (Leptospirosis)

- Static pure water tanks should be covered where rodents cannot enter or urine may pass inside the vessel.
- Precautionary clues are rat droppings in the vicinity of the water tank & wet marks on the outside or on top of your tank or vessel.
- Never drink your production water & avoid swallowing potentially contaminated

water.

- Filters should be replaced on a regular basis.
- Look out for signs of an incubation period that can vary from three days to three weeks. Most patients suffer severe headaches, red eyes, muscle pains, fatigue, nausea & a temperature of 39C or above. In roughly a third of cases there is a skin rash, sometimes hallucinations.

The choice of tank system/trolley system & the choice of WFP equipment can be determined by:

The duration & extent of work. The height of windows to be cleaned. The site conditions & the proximity of work to your equipment.

WFP's come in various heights or sometimes sections can be added to take them higher. Please be aware that operating a WFP & cleaning at extreme heights is very different than from cleaning at a lower level. The effort & force needed to safely control your WFP demands much more physical activity at the higher end & therefore rest breaks are needed much more frequently. It is also prudent to assign a watcher & take turns at operation of the WFP.

The means of purified water delivery required. Hose lengths & loss of pressure to reach your desired target window & the maximum pump potency & the number of users from the same system.

For some jobs WFP's may be used in place of other access methods, i.e. for domestic properties to reach conservatory roofs or other windows inaccessible for ladders. On high rise buildings to reach the lower part of buildings & bridges or on glazed structures where no means of support is offered to abseilers (high rise) window cleaners.

WFP's may also be used from MEWPS. In addition to normal guidelines for MEWPS operation, consideration should be given to securing the pole to the MEWP basket to prevent it falling if dropped. The weight of water transported on the MEWP & any other occupants & equipment would have to be calculated so to not overload the maximum weight in the operator basket. However, water can be stored on the roof of a building in some cases or pumped from the ground which provides additional risk assessment & trailing hose dangers.

Procedures should be implemented to prevent snagging of any hoses trailing from the MEWP basket to the water delivery system. Procedure should include a banksman with a sharp knife to cut hoses in the event of a snag. In many cases in the UAE (United Arab Emirates), high rise window cleaners have been known to use WFP's whilst abseiling & the weight of the pole having it's own safety line.

A safety line can also be used as an attachment to the head or brush end on WFP's as an

extra precaution (usually above 50 feet). When in normal use, attaching a WFP securely from an anchor at the top of a building via rope or similar (with a tension operator) is logical as an extra precaution.

For many buildings, however, WFP's may be used for the entire cleaning operation. Due to the physical rigor or prolonged use - consideration should be given to the weight of the pole, the lightest pole being the one that adequately reaches the top of the window. Many WFP's now have the ability to "break down," so you only use the sections that you need for the height of the corresponding building.

WFP systems in vehicles are costly & are increasingly being discarded for a pure water static tank or vessel from a central locality. Pure water can be refilled in to either drums or backpacks & fed to WFP's whilst the static system can be left to produce water. The bonus of this system is operations can be carried out from a smaller vehicle with a smaller crew & only needing the amount of pure water for the work you need for that day. Drawbacks are possible back strain from lugging drums & refilling manually. Trolleys & backpacks could also be refilled from a much smaller onboard tank in your vehicle & mechanically transferred by usage of the vehicles battery or manually operated pumps.

No WFP's are best suited for use near electric. They **ALL** conduct electricity, no matter what they claim & conductive properties will occur within WFP's when water flows through them or not. There are some WFP's that have more resistance than others, but will still conduct electric to the user. Many WFP users have died to date, especially in North America. Railways & electricity generating stations or substations or any other site that poses an increased risk of electrocution should not use WFP as a means of cleaning, unless the electric is switched off & you carry the master key for access to the electric room that provides the electric current in the area you are working & it is lock/switched off. All other key holders must be notified & signed off before work commences.

Purified water may be delivered to the WFP by a flexible hose from a variety of sources, those include de-ionising cylinders/columns or cartridges, vehicle & trailer mounted systems & static systems incorporated into the building design. Delivery hoses pose a trip hazard that can be minimalised if brightly coloured hose is used & warning signs are displayed where ever hoses cross a walkway or in heavy foot traffic areas. Hose guides can be bought where the hose lays in a gap on an elevated ramp where pedestrians can walk over safely.

Maintenance of WFP's & accessory equipment are subject to the requirements of the provision & use of work equipment regulations 1998 (PUWER). WFP's should be subject to:

- Pre-use visual inspection – Obvious defects i.e. worn/fractured/dented/bends in pole sections, loose/cracked/broken clamps, head/brush fittings, worn butt rings etc.

Hoses should also be checked for pin holes & if they are worn.

- Regular documented management inspections that take into account the degree of use & type of pole quality. In practice, pre-inspections are recommended on each use with a thorough inspection each month. Most professional window cleaners take their poles apart section by section & clean each piece individually looking for signs of wear & checking clamps are set correctly.
- Procedures should be in place for handling any defects found that would include repair or replacement. The use of WFP's requires some skill & can be physically demanding unless the correct techniques are employed (most notably a rocking technique). WFP's in a poor state of repair will require more physical effort to operate & harder to control if they should fall.
- Regular replacement of filters ensures both the quality of the pure water produced for cleaning use & the effective control of legionella bacteria & weils disease. Manufacturers & suppliers should specify the appropriate intervals for filter replacement. Generally smaller filters shall require more frequent replacement than larger filters. Because of the enormous revenue & popularity of WFP cleaning, many companies do not provide this information because of work loads.
- In order to ensure that the installation in the vehicle continues to meet the requirements of regulations an annual inspection should be carried out by a competent person & any remedial work taken out after an inspection.

Use of WFP's: When extending telescopic WFP's it is desirable to raise the pole vertically up a wall with the brush head facing the user so not to foul the brush. When this is not possible it will be necessary to extend the pole to the desired length horizontally along the ground, raising the pole from this position is usually a two-person operation, one to stabilise the base (usually with his feet) & steady the pole, while the second "walks" the pole up towards the user. When using a modular WFP, a section at a time is added, it is advised that you have a basket/cart nearby or someone to aid you as visually looking at the top of a pole & grabbing sections is not usually possible to do safely.

Manual Handling of WFP's: It feels more natural to operate a WFP by movement of the arms alone & this is acceptable for poles that extend to a height of 10 metres. For WFP's that extend beyond 10 metres, excessive strain may be exerted upon the upper body when operated for extended periods.

It is recommended that when operating poles above this height, use of arms should be reduced by greater use of leg/whole body movement. With experience comes the ability to work with the natural balance of the pole, less effort is expelled once the operator has mastered the balance technique & has learned to use the stored energy generated in the bending & flexing of pole as it is guided through the cleaning task, in fact in some

cases the stored energy within the pole on a flex can be used to clean in difficult situations.

WFP's are easier to operate when the WFP is more rigid & transferring the power from the base to the head becomes easier. More expensive WFP's are generally stiffer with higher grade carbon fiber being used, but that also comes with the ability to be able to break more easily. The trade off between rigidity & flexibility is usually shown in the marked price of a WFP & materials of construction, including clamps & wear & quality accessories.

Working for long periods with a WFP has led to backache & neck strain from the constant task of looking skywards. "Belay" glasses used by rock climbers are now available to WFP users that have the ability to keep your neck in the normal stance facing forward while having the ability to see upwards at the head of the WFP. Other back braces & contraptions are available & based questioned to peers in the industry will tell you if they are utilised or not.

Even with the benefit of training, these techniques take time to master & they are easier to acquire when shorter poles up to 10 metres are used. It is important both for development of new skills & in order to deliver acceptable cleaning standards, that new staff become experienced using short poles before moving up to poles that extend above 10 metres.

Measures to reduce fatigue:

- Operate poles with greater use of the legs, by stepping a single stride forward & back use of the arms may be significantly reduced
- Pole sharing with other members of the team.
- Switching from the left hand side of the body to the right, & visa versa.
- Taking regular breaks to undertake other tasks.
- Taking periodic breaks free from activity. In adverse weather or windy conditions extra care should be taken especially when moving from a sheltered elevation to one more affected by the wind.
- WFP use is not recommended in winds above 25mph. Regardless of wind strength, WFP's should never be left unattended in an elevated position.
- Purified water is a poor conductor of electricity. However once the water touches the window, the water becomes fouled & has normal conductivity. WFP's made of aluminium construction should not be operated in any environment where they

may come in to contact or come within 5 metres of a source of high voltage electricity. Any WFP should not be operated when a risk of an electrical/lightning storm exists.

- During cold spells the likelihood of purified water freezing in the delivery hoses will adversely affect the use of WFP's. Systems that deliver hot water may be affected to a lesser extent & precautions should be taken to ensure that any water that may fall on to walkways is prevented from freezing by the prior application of sodium grit.
- Working in hot conditions can also present more problems when it is hotter outside & mechanical cooling (air conditioning) takes place inside a building. Temperature differential can occur between the inside temperature & outside causing glass to crack. This is not a common occurrence but it has been known. It can also be noticed when a tempered glass window has been privacy screened half way & a crack may appear because the of the stress of glass temperature differential in such a close space.

Working in exposed positions: The need to concentrate on overhead activity may expose the operator to further hazards that may include:

- Trips or falls.
- Falls from flat roofs.
- Collision with pedestrians or road traffic.

Risk Assessment: The purpose of risk assessment is simply to identify particular risks on any job in order to take precautions to minimise them, typically these may include:

- Instruction in the need for the operator to be vigilant with regard to the surroundings.
- Providing adequate PPE &/or roof edge protection or other systems.
- Giving consideration to the day & time of cleaning.
- Provision of high visibility clothing.
- Cordoning off work areas to prevent public access.

Lone Working: Lone workers are defined as employees who work by themselves without close contact or direct supervision (this section does not apply to self employed window cleaners). No window cleaner should work alone in any area or location that would involve increased risk to their safety. i.e. on a busy street or near an electric

source. If working in a team on a single site, regular (hourly) checks should be made on any lone worker. If a window cleaner is dropped on a job to work solo, intervals between contacts should not exceed one hour.

If a window cleaner is working solo for a full shift or day, a one hour contact system should be established. With modern cell phones, checks can also be made easier, or walkie-talkies can also be utilised.

Personal protective equipment (PPE) PPE is not directly relevant to the use of WFP's & is limited to protection against adverse weather conditions. However it is not prudent to work when the weather is so adverse, visibility makes the job impossible impairing the finished clean. Wind is a problem for WFP use & will also kick up dust fouling windows.

Hard hats may however be appropriate when use of WFP's may dislodge defective parts of the building fabric.

Training & Competence: All WFP users should be suitably trained & competent. They should have appropriate knowledge, experience & practical skills for the work being undertaken. Personnel with different levels of responsibility, such as team leaders or managers, will require different types of competence at different scales, but responsibility & safety of personnel should be in the highest regard.

There are courses & qualifications with regard to safety of WFP's, contact WCA for more information. New employees can therefore learn competence on joining a company if they are a good fit. Management must assess proof of competence at the earliest opportunity. This competence is best assessed on a live contract, with constant monitoring.

The following criteria should be used at initial & ongoing assessments:

- Daily pre use check of WFP & WFP systems.
- Manual handling of WFP's.
- Ground conditions & environmental factors when using a WFP.
- Cordoning off working areas.
- Common hazards when using a WFP.

Dos & don'ts - Any gaps in knowledge should be assessed & suitable training &/or supervision should be provided until competence is achieved. WFP specific training covering all aspects covered in these guidance notes in greater detail can be attained. The WCA can help where an accredited course certificate is needed. Please contact the WCA for information on obtaining a certificate from the Institution of Occupational

Safety & Health (IOSH).

Competent Person: A competent person may be defined as a designated person suitably trained or qualified by knowledge & practical experience to enable them to:

- Carry out required duties at their level of responsibility & look out for other personnel.
- Fully understand any potential hazards related to their work & relay that information.
- Detect any defects or omissions in carrying out their window cleaning duties.
- Recognise any implications for health & safety, & be able to specify appropriate remedial action needed including refusal to do work if the danger is too great.
- Know their limitations & not be frightened to ask for help. In other words a competent person should not only be able to discover defects, but tell others what effect they are likely to have.

Dos & Don'ts

- Don't use a defective WFP.
- Don't use a WFP in high winds.
- Don't use a WFP near overhead power lines.
- Don't use a WFP during thunder & lightning.
- Do carry out pre-use checks of equipment.
- Always cordon off &/or display suitable warning signs when working in public areas.

Further Reading

Road Traffic Act 1998

Road Vehicle (construction & use) Regulations

BS EN: 12195 Load Restraint Regulations

Control Of Substances Hazardous to Health (COSHH) Regulations 2002

Approved Code of Practice (L8): The Control Of Legionella Bacteria in Water

Systems 2000

Workplace Health, Safety & Welfare Regulations 1992

Manual Handling Operations Regulations 1992

Work at Height Regulations 2005

PUWER : Provision & Use of Work Equipment Regulation

HASAWA: Health & Safety At Work Act 1974

MANAGEMENT REGS: Management Of Health & Safety At Work Regulations

PPE REGS: Personal Protective Equipment Regulations.

HSE's website provides more advice, guidance and answers to frequently asked questions. Industries and trade associations have produced guidance about working at height for specific jobs or for using certain types of access equipment. Find out more at <http://www.hse.gov.uk/work-at-height/index.htm>



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