



# HIGH PRESSURE WATER JETTING

BECAUSE TRAINING MATTERS

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**SKILLS  
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# HIGH PRESSURE WATER JETTING

## Courses

### INTRODUCTION

High pressure water jetting can be extremely dangerous. It is therefore essential that all staff expected to use this type of equipment receive appropriate and adequate training in accordance with the High Pressure Water Jetting Association's (HPWJA) Code of Practice.

The courses we offer are Certificated by the HPWJA and run in accordance with their Code of Practice.

Pressure injection injuries, especially to the hand and upper extremities, are serious injuries with life and limb threatening potential. The pressure required to penetrate the surface of the skin is in the order of  $7 \times 10^5$  N/m<sup>2</sup> or 100psi. However, pressures currently used for ultra high pressure water jetting can exceed 2500bar (35,500lbs/in<sup>2</sup>). When a high pressure injection injury occurs the kinetic energy absorbed by the tissues is substantial and the toxic material is often driven from the fingertip to the palm. Injuries in which an irritant material is injected have a particularly poor prognosis even with the prompt exploration and debridement. Amputation of the finger is often required in these cases.

Water injection injuries do not result in the same degree of secondary tissue damage and toxicity although the greater pressures and nozzle velocities can result in very extensive tissue injury. The pattern of tissue damage can be similar to that of high velocity missile gunshot wounds. All high pressure water jet injuries should be considered surgical emergencies.

The small entrance wound and lack of an exit wound is not indicative of the extensive disruption of deeper tissues which can result from dispersion of kinetic energy penetration of the skin by water.

### TRAINING

Health and Safety within the water jetting industry is of paramount importance, trained staff will have a greater awareness and appreciation of safe working practices with high pressure water jetting. Councils, insurance companies, water utilities and major contractors all demand that staff have the correct training and hold valid Certificates. A number of training courses are available, starting with the Safety Awareness Certificate. The Safety Awareness course is essential as it "Validates" the other courses. The certificate lasts for three (3) years. After three years, another Safety Awareness course must be taken and passed in order to re-validate other course certificates. If your Safety Awareness certificate goes out of date, for any reason, your other certificates immediately become invalid. A valid Safety Awareness certificate is required to keep all certificates validated.

### WHO SHOULD ATTEND

All those who may be required to use High Pressure Water Jetting equipment as part of their job. The Safety Awareness course will also be useful to those required to manage or supervise staff using this type of equipment.

For those who are involved with smaller, lower power jetting machines e.g. for vehicle washing, or small plant cleaning, or general clean-up jobs. The Pressure Washing course on page 5 will provide a more appropriate training programme.



## SAFETY AWARENESS TRAINING : 1 DAY

### COURSE CONTENT

- ▶ Applications and machines
  - ▶ Cleaning and surface preparation
  - ▶ Jet cutting – precision and volume removal
- ▶ Legislation and the WJA Codes of Practice
  - ▶ Health & Safety at Work Act
  - ▶ WJA Codes of Practice
- ▶ Jetting equipment – nozzles
  - ▶ Jet principles
  - ▶ Types of nozzle
- ▶ Jetting equipment – pumps
  - ▶ Pump configuration
  - ▶ Water supply/delivery features
  - ▶ Pressure safety release options
- ▶ Jetting equipment – pressure controls
  - ▶ Dump and dry shut controls
  - ▶ Pressure regulators
- ▶ Jetting equipment – high pressure hose
  - ▶ Hose construction and pressure ratings
  - ▶ Hose end fittings
  - ▶ Connectors and hose end couplings
- ▶ Water jetting hazards
  - ▶ Directly from the water jet
  - ▶ From the operational regime
- ▶ Water jetting injuries
  - ▶ Effects of impact by high pressure water jet
  - ▶ Use of WJA medical card
- ▶ Personal protective equipment
- ▶ Operational procedures
  - ▶ Routine care and inspection
  - ▶ Safety points during operation

## DRAIN AND SEWER CLEANING : 1 DAY

### COURSE CONTENT

- ▶ Key safety awareness issues
  - ▶ Nozzles and jets
  - ▶ Pumps and ancillaries
  - ▶ Operational procedures
- ▶ Applications and machines
  - ▶ Scope of drain and sewer cleaning applications
  - ▶ Range of cleaning requirements and standards
- ▶ Jetting equipment – nozzles and ancillaries
  - ▶ Review nozzle principles
- ▶ Jetting equipment – high pressure hose
  - ▶ Hose used in drain and sewer applications
  - ▶ Bore size and flow capabilities
- ▶ Jetting equipment – machines
  - ▶ Range of jetting machines used
  - ▶ Pump pressure controls
  - ▶ Water supply/delivery features
- ▶ Job assessment and planning
  - ▶ Information and assessment
  - ▶ Selection of equipment and manning levels
  - ▶ Safe system of work
- ▶ Operational procedures
  - ▶ Daily checks
  - ▶ Setting up
  - ▶ Nozzle entry and advance into pipe
- ▶ Practical exercises
  - ▶ Jetting machine and equipment
  - ▶ Job assessment
  - ▶ Discussion of options



# SURFACE CLEANING AND PREPARATION TRAINING : 1 DAY

## COURSE CONTENT

- ▶ Key safety awareness issues
  - ▶ Nozzles and jets
  - ▶ Pumps and ancillaries
  - ▶ Hazards and injuries
- ▶ Applications and machines
  - ▶ Scope of surface cleaning and preparation applications
  - ▶ Range of tasks
  - ▶ Range of jetting machines suitable for surface cleaning/preparation
- ▶ Jetting equipment – nozzles and ancillaries
  - ▶ Review nozzle principles
  - ▶ Associated ancillary equipment
- ▶ Jetting equipment – high pressure hose
  - ▶ Hose used in surface cleaning and preparation applications
  - ▶ Damage and wear possibilities
  - ▶ Hose ancillaries
- ▶ Jetting equipment – machines
  - ▶ Range of jetting machines used
  - ▶ Engine controls and instruments
  - ▶ Auto engine speed control systems
  - ▶ Pressure safety relief
  - ▶ Water supply/delivery features
    - ▶ Filtration requirements
    - ▶ Boost feed pumps
- ▶ Job assessment and planning
  - ▶ Information and assessment
  - ▶ Base material and contaminants
  - ▶ Selection of equipment and manning levels
  - ▶ Safe system of work
- ▶ Operational procedures
  - ▶ Daily checks
  - ▶ Setting up
  - ▶ Monitoring of operation
  - ▶ Job completion
- ▶ Practical exercises
  - ▶ Jetting machine and equipment
  - ▶ Job assessment
  - ▶ Site preparation
  - ▶ Team talk
  - ▶ Demonstrate all procedures





# PRESSURE WASHING : 1 DAY

## WHO SHOULD ATTEND

This 1 day *stand alone* Pressure Washing course is designed for those who are involved with the smaller, lower power jetting machines. Maybe for vehicle washing, or small plant cleaning, or just general clean-up jobs. The machines can be electric, diesel, petrol or PTO driven.

Your machine can be of any make, as long as it does not exceed 3000psi @ 5gpm then this is the course for you.

## INTRODUCTION

This course does not require you to have a Safety Awareness Certificate before attending. The certificate and photo card are valid for 3 years and are issued by the Water Jetting Association (WJA), are recognised by the HSE and also have City & Guilds Accreditation.

The morning of the course consists of issuing each trainee with the latest WJA Code of Practice for them to use during and after the course, followed by the theory which covers safety, injuries, legislation, PPE etc. with the afternoon for the practical session. There will be a question paper towards the end of the day with 20 questions requiring a minimum 75% correct answers to successfully complete the course.

Certificates and photo cards are issued to those candidates who reach the required standards and these need to be renewed every 3 years.

## COURSE CONTENT

- ▶ Applications & machines:
  - ▶ Effect of varying pressure/flow at the nozzle
  - ▶ Range of jetting machines
- ▶ Legislation & the WJA codes of practice:
  - ▶ Health & safety and risk assessment
  - ▶ WJA codes of practice
- ▶ Nozzles:
  - ▶ Jet pressure/flow characteristic
  - ▶ Types of nozzle – forward facing, fixed and spinning jets, multi-jet fixed & spinning nozzles.
- ▶ Pumps:
  - ▶ Pump configuration
  - ▶ Water supply/delivery features
- ▶ Pressure controls:
  - ▶ Dump & dry shut controls
- ▶ Water jetting hose:
  - ▶ Hose construction and pressure ratings, external & internal damage possibilities, hazards arising from damaged hoses, inspection requirements.
  - ▶ Hose end fittings, construction/assembly/testing.
- ▶ Hazards:
  - ▶ Hazards arising directly from the water jet – from operational regime – from site environment.
- ▶ Injuries:
  - ▶ Effects of impact by high pressure water jet – nature of internal injuries caused – action in event of a jetting injury – awareness of possible absence of visual injury and use of WJA medical card.
- ▶ Personal Protective Equipment:
  - ▶ General principles regarding use of PPE as a last resort; main body protection – limits on effectiveness against direct impact of water jet. Protection of head, hands, feet, hearing, respiration.
- ▶ Operational Procedures:
  - ▶ Routine care and inspection – site preparations – preparations for operation – team operation.
  - ▶ Use of do/do not guide.
- ▶ Summary:
  - ▶ Review of course content as above – with opportunity for any further discussion before questionnaire.







## ABOUT US

- Our Accreditations
- Specialist Facilities
- Legislation / Code of Practice



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