

# COMPRI Tube Clean

## CE SYSTEM



## USER MANUAL

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# Introduction

Congratulations on your purchase of a new CE (Contamination Eliminator) System, a breakthrough in cleaning internal surfaces of hoses, tubes and pipes.

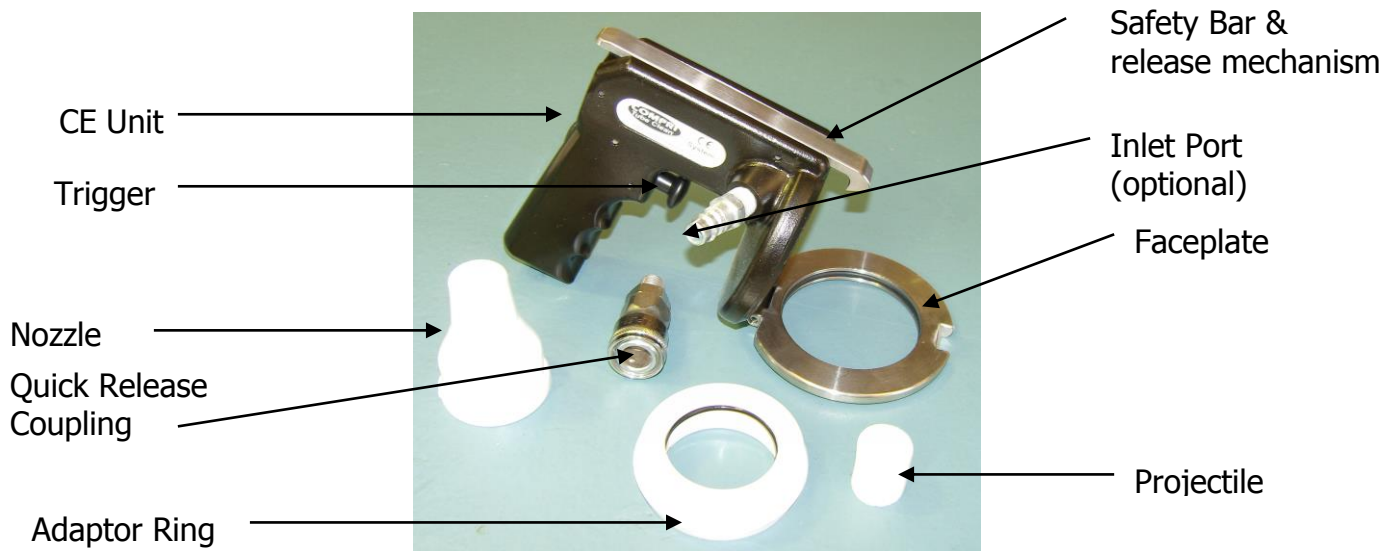
This CE system User Manual will give you basic information on how to obtain the most efficient use of your CE System.

Please follow carefully ALL the safety procedures and recommendations contained in this handbook for the safe use of your CE-System. Failure to follow the procedures and recommendations can be potentially dangerous.

Contact your CE System distributor immediately if you have any questions about the use of your CE System.

Compri Tube Clean's Research and Development Department is continually developing better methods to overcome traditional cleaning problems, and seeking new applications for removal of contamination in hose, tube and pipe.

# Description of the CE System



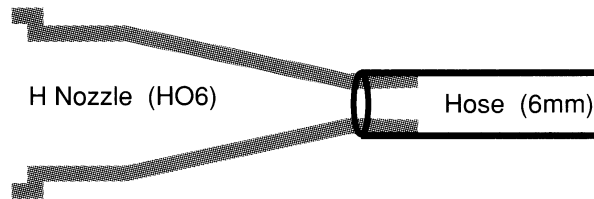
## CE Unit

- The body of the CE Unit which houses the moving parts.
- The faceplate that pivots from the front of the unit and accepts the adaptor ring or nozzle.
- The safety bar and release mechanism that pivots on top of the unit and locks the faceplate in position.
- The inlet port (optional) to which the compressed air source is attached. (An 8mm quick release coupling is provided for application to the inlet port and air source hose).
- An adaptor ring that fits into the faceplate and accepts nozzle sizes less than 38mm.
- An O ring that fits into the adaptor ring that completes the seal with the nozzles.
- An O ring that fits into the body of the unit and completes the seal on the outside of the faceplate.
- The trigger mechanism that releases the compressed air and discharges the projectile into the hose, tube or pipe.

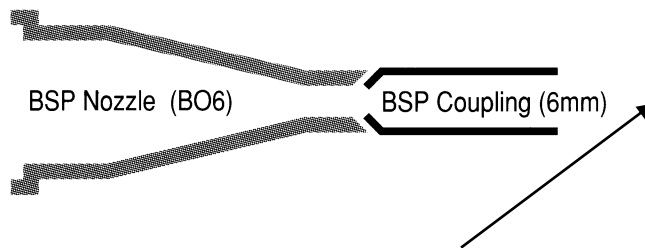
# Nozzles

A range of nozzles are included, allowing the CE System to be used on differing sizes and types of hose, tube and pipe, as well as coupling configurations. Special nozzles can be made to suit specific applications.

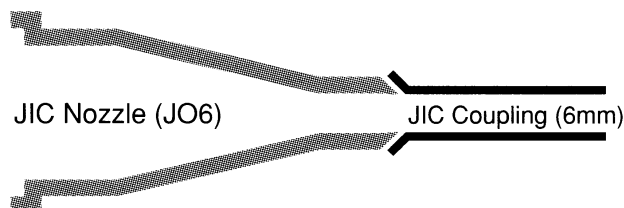
**Hose:** The nozzle is inserted into the hose. Therefore, the external diameter of the nozzle must be less than the internal diameter of the hose.



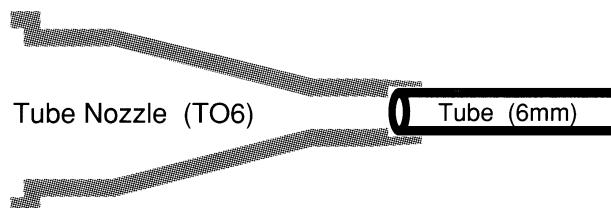
**BSP coupling fitting:** The female flared fitting of the BSP nozzle butts against the male BSP coupling.



**JIC:** The male flared fitting of the JIC nozzle butts against the female JIC coupling.



**Tube:** The nozzle is inserted over the tube. Therefore, the external diameter of the tube must be less than the internal diameter of the nozzle.





160 BEECHBORO ROAD SOUTH  
 BAYSWATER WA 6053  
 +61 08 92714626 MOB 0424036142  
[info@compri.com.au](mailto:info@compri.com.au)  
[www.compri.com.au](http://www.compri.com.au)

## PROJECTILE DESCRIPTION

	<p><b>S STANDARD PROJECTILES</b></p> <p>STANDARD PROJECTILES are made of high density Polyurethane foam. Typical applications are hoses and tubes without restrictions, and the manufacturing industry for product recovery of extremely viscous materials such as chocolate, glue, etc. Will negotiate right angle bends, coils and T-junctions. When selecting the correct projectile choose one approximately 20% larger than the internal diameter of the hose or tube to be cleaned. <i>Free of Chlorine.</i></p>
	<p><b>C COUPLING PROJECTILES</b></p> <p>COUPLING PROJECTILES are medium-density polyurethane foam; this foam has a high tear resistance and is extremely compressible. Used extensively in the hydraulics industry and the manufacturing industry for product recovery. Will negotiate right angle bends, coils, T sections and pipe reductions with ease. When selecting the correct projectile choose one approximately 20% larger than the internal diameter of the hose or tube to be cleaned. <i>Free of Chlorine.</i></p>
	<p><b>PR PRODUCT RECOVERY PROJECTILES</b></p> <p>PRODUCT RECOVERY PROJECTILES are made of low-density Polyurethane foam. This extremely compressible (up to 70%) Projectile is used for cleaning lines with large variations in diameter. Completely harmless to health and hygiene these projectiles are utilized for recovering or removing existing products in Food, Beverage, Health, Cosmetics and Chemical Processing lines. Loss of production time for product changes and disposing of costly contaminated waste is significantly reduced.</p>
	<p><b>A ABRASIVE PROJECTILES</b></p> <p>ABRASIVE PROJECTILES are made of high-density Polyurethane foam with an abrasive pad on the front end. Ideal for removing rust and mill scale from metal pipes. Used for the cleaning of boiler tubes, condenser tubes, carbon deposits from oil feed lines, etc. Will negotiate right angle bends, coils and T sections. When selecting the correct projectile choose one approximately 20% larger than the internal diameter of the hose or tube to be cleaned.</p>
	<p><b>GR GRINDING PROJECTILES</b></p> <p>GRINDING PROJECTILES are high-density Polyurethane foam coated with an aluminium oxide. Very aggressive, used for heavy duty clearing of metal tubes and pipes to remove heavy rust etc. Will not easily negotiate sharp bends, best suited to straight tube or swept bends. When selecting projectile choose one as near to the internal diameter as possible, maximum 5% over size.</p>

# Operation of the CE System

To begin operation the CE Unit needs to:

- Be connected to an air source of minimum recommended pressure of 600kPA (85 psi).
- Have a selected nozzle inserted into the faceplate.
- Have a projectile loaded in the nozzle.

These steps are outlined below:

## AIR SOURCE Step1



The unit is supplied with an 8mm quick release coupling. Place this coupling against inlet port on the body of the CE Unit and snap coupling to inlet port. The recommended minimum air pressure is 600 kPA (85 psi). The air pressure must not exceed 1,050kPA (150 psi). The air source can be a standard 8-15 cfm compressor or suitable gas bottle (oxygen free nitrogen). The air line and any connection from air source to the CE Unit must be no less than 8mm.

## Nozzle Step 2

Open the faceplate of the CE Unit by pressing the safety bar and release mechanism with the thumb of the hand holding the CE Unit.

Drop the faceplate down. Select a suitable nozzle for application and insert. For nozzles less than 38mm, an adaptor ring (AR1) should be fitted prior to insertion of the nozzle.



## Projectile Step 3



Select the correct size projectile from the chart titled "Recommended Projectile Sizes" located on the inside cover of the CE System carry case and load this projectile into the nozzle.

## Ready for use Step 4

Close faceplate and ensure the safety bar and release mechanism locks the faceplate into position.



## Operation Step 5



Before operating the CE Unit, ensure that the exit end of the hose, tube or pipe is contained in a projectile catcher. This is important as some projectiles such as the carbon-rundum type, together with any contamination that is expelled, may cause injury. Further, it is important to recover the spent projectile so it can be used diagnostically to assist in determining the state of cleanliness and the condition of the hose, tube or pipe it has passed through.

Place the nozzle of the CE Unit firmly against the hose, tube or pipe to be cleaned to ensure a firm seal is achieved. Depress the trigger making sure it remains depressed until the projectile emerges from the other end. If the trigger is released prior to the projectile emerging, it will remain in the hose, tube or pipe until the trigger is pressed again.

## Storage and Disposal

New projectiles should be stored in boxes so they are not exposed to direct sunlight or fluorescent light as this causes discolouration. Used projectiles can be disposed of as part of general rubbish.

## Selection of Projectiles

The projectile cleans by being passed against the internal surface of the hose, tube or pipe. This pressure is achieved as the projectile is approximately 20% larger than the internal diameter of the hose, tube or pipe. For instance, a 50mm projectile is recommended for a 38mm hose.

There are four types of projectiles currently available:

Type	Application
Standard (S)	Hose, tube or pipe without fittings
Coupling (C)	Assemblies and fine particles of contamination
Abrasive (A)	Hose, tube or pipe with build up of contamination, surface rust or mill scale
Grinding (GR)	Straight lengths of tube or pipe with greater build up of contamination, surface rust or mill scale.
Product Recovery (PR)	Lines with large variations.

The included table sets out the recommended projectile sizes (standard, coupling and abrasive) for the particular hose, tube, pipe or assembly fitting and the recommended



sizes for grinding projectiles. Individual circumstances will vary requiring a smaller or larger projectile. If the projectile is too large it will not leave the nozzle and if its is too small it will not clean effectively.

The enomous variety in the types of couplings available today could also mean in some circumstances that the recommended size is inappropriate. When cleaning assemblies, a reduction in projectile size may be appropriate, as ll the recommendations are based on the most commonly used coupling sizes.

If the projectile remains lodged in the hose, tube, pipe or assembly then the CE Unit should be operated from the other end without a projectile. In this way the projectile will be ejected from the original entry. It is important to achieve an air tight seal. In the vent a nozzle does not fit snugly, try reducing the nozzle size.

*Compri Tube Clean's Research & Development Department can produce projectiles to suit specific applications.*

## Projectile Usage

In the hydraulics industry, exhausive tests have proved that contamination is the cause in 70% of hydraulic failures. University tests have proved cutting of tube and hose with a steel cutting disk introduces 800-1200micron particles with a weight of 30-50 milligrams in a 1 metre of hose. Compri Tube Clean have researched the varying levels of cleanliness required in the hydraulics industry and determined the projectile usage to reach these levels.

To obtain recommended levels of cleanliness when manufacturing an assembly please refer to the chart below. Standard projectiles should be fired from either end of the hose or tube. After fitting the couplings, further coupling projectiles should then be fired through to ensure any possible contamination introduced during manufacturing (lubricants, etc) are removed.

University tests have demonstrated that standard projectiles removed larger size contaminants and absorb fluids, whilst coupling projectiles remove the smaller particles.

<b>LEVEL</b>	<b>EXAMPLE</b>	<b>PROJECTILE USAGE</b>
1	Common control valves and intake lines from reservoirs to filters.	1 standard projectile through hose. 1 coupling projectile through assembly.
2 & 3	Intake lines to pumps. Pressure lines from motor valves to cylinders	2 standard projectiles through hose. 1 coupling projectile through assembly.
4	Hydrostatic drive lines, servo control lines, aircraft lines	2 standard projectiles through hose. 2 coupling projectiles through assembly.

*Tubing should use 1 or 2 abrasive projectiles before following the above procedures.*

In other application such as boiler tubes and heat exchangers, the physical properties and distribution of the material to be removed influences the type of cleaning action required, hence the choice of projectile. In many cases a range of different projectiles

will be used in succession to provide the optimum cleaning action. Standard and coupling projectiles should always be used after abrasive or grinding projectiles to remove any resulting contamination.

## Maintenance

Standard maintenance procedures

- Keep the CE Unit clean and ensure it is always stored in its carry case.
- The nozzles can be conveniently cleaned by using soap and warm water.
- Smear the O rings with high grade petroleum jelly or light grease periodically.

## Safety

- Ensure faceplate is locked into the closed position before depressing the trigger
- Ensure air supply is correctly fitted.
- Ensure CE Unit is pointing in a safe direction before operating.
- Ensure the end of the hose, tube or pipe where projectile and contaminants will be ejected is contained in a projectile catcher and is pointing in a safe direction.
- Safety glasses must be worn when operating the CE System.
- Do not operate the CE System when aimed at another person.
- Turn off air supply before disconnecting line if a self closing valve has not been used.
- Use protective gloves as required.
- Use protective clothing as required.

## Problem Solving for the User

Problem	Solution
Projectile remains lodged in hose, tube, pipe or assembly	<ul style="list-style-type: none"> <li>• To clear projectile, operate unit from other end without using a projectile; then</li> <li>• Check hose, tube or pipe for leaks, holes, breakages etc</li> <li>• Check restrictions in line, i.e. contraction from 10mm to 5mm then expansion to 10mm.</li> <li>• Check projectiles for tear marks.</li> <li>• Check air pressure on air source</li> <li>• Check hose fittings from air source are correct.</li> <li>• Consider using smaller projectile</li> </ul>
Projectile will not enter hose, tube, pipe or assembly	<ul style="list-style-type: none"> <li>• Try smaller projectile. Check air pressure, as compression unit may not have built up sufficient pressure.</li> <li>• Make sure quick release coupling is correct size (8mm minimum is required).</li> <li>• Operate unit from other end.</li> <li>• Ensure tube entry is not restricted from process of cutting</li> </ul>
CE Unit will not	<ul style="list-style-type: none"> <li>• Check safety bar and release mechanism is locked into</li> </ul>

operate	place.
Leaking air at hose, tube, pipe or assembly entry	<ul style="list-style-type: none"> <li>• Hold unit firmly against hose, tube pipe or assembly to ensure proper seal.</li> </ul>
Contraction of two pipes into one	<ul style="list-style-type: none"> <li>• Operate CE Unit from one of two ends in the one continuing line.</li> <li>• Operate CE Unit from other end into the one continuing line.</li> </ul>
Nozzle does not fit into O ring on CE Unit easily	<ul style="list-style-type: none"> <li>• Apply small amount of high grade petroleum jelly to O ring.</li> </ul>
Cleaning of T-piece	<ul style="list-style-type: none"> <li>• Operator must fire into a T piece. Block either end to clean each side.</li> </ul>
Trigger jams allowing air to escape	<ul style="list-style-type: none"> <li>• Release quick release coupling.</li> <li>• Tap CE Unit lightly against nearest solid object.</li> </ul>

## Research & Development

Compri Tube Clean is committed to supporting its distributors and customers by continually developing better methods to overcome traditional problems in the removal of contamination from hose, tube and pipe. Many of the ideas for new developments have come from existing users.

The Compri Tube Clean Research and Development Department has research, design and testing facilities to meet these challenges as they arise.

Users of the CE System should in the first instance contact their distributors when a problem occurs. Each distributor will hold a research & development (R & D 001) form which should be completed and sent to Compri Tube Clean in Western Australia. It is important that the following information is communicated to enable an efficient resolution:

- The application (i.e. boiler, heat exchanger tube)
- Type of contamination
- Internal and external diameter of hose, tube or pipe; and length
- Any other relevant information.

## Guarantee

The CE System and its components (excluding projectiles) are guaranteed against manufacturing defects and faulty materials for a period of 12 months from the date of the original purchase.

Should any fault in manufacturing or materials be found, the purchaser should immediately communicate with the distributor from which the CE System was purchased, and arrange for its return.

In the event of any defect being disclosed in any part manufactured or supplied by Compri Tube Clean, Compri Tube Clean will repair free of charge such defective part subject only to the conditions of the guarantee set out below.

Compri Tube Clean's product guarantee is extended to the first purchaser and to each subsequent purchaser of the goods, provided only that when making a claim within the guarantee period, the present owner is able to provide proof of purchase.

## Conditions of Guarantee

1. This product guarantee only applies to the parts and components of the CE System (excluding projectiles). The guarantee becomes invalid if such parts or components are removed and used in any other products or for any other purposes.
2. The product guarantee is void if projectiles other than those made or licensed by Compri Tube Clean are used at any time.
3. Upon examination, Compri Tube Clean must see that the defect has not been caused by misuse, wear and tear, dirt, fire, or accidental damage.
4. COMPRI Tube Clean is not liable for labour or for any loss or expense arising from a breakdown of any parts or for any consequential damages, direct or indirect, or for any repairs made or attempted to be made without the written permission of Compri Tube Clean. Distributors are not authorised to give any warranty or make any representation whatsoever, verbal or otherwise, other than those contained in the above guarantee. To ensure protection under guarantee, purchasers should note that the registration number should not be removed or defaced.

## Patent

Patent pending PCT/AUS/00352

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**COMPRI TUBE CLEAN**



160 BEECHBORO ROAD SOUTH  
BAYSWATER WA 6053  
TEL: 08 92714626 MOB: +61 424036142  
EMAIL: [info@compri.com.au](mailto:info@compri.com.au) WEB [www.compri.com.au](http://www.compri.com.au)