

Question and Answer	Question & Answer
Chromalox group	How often do we need to check pressure vessels and plumbing?
Jon Davignon	CFR180.209 table 1. Plumbing? Inspected quarterly or when having calibration problems
Charles Grenici	
Chromalox group	Do we have appropriate pressure gauges?
Jon Davignon	If they are from Galiso Yes.
Charles Grenici	
Chromalox group	Should normal testing (max) pressure ranges be indicated on the gauges (visible indicators)?
Jon Davignon	This should be on a chart by the console. Galiso chart of test pressures P/N 01-32-2670 \$8.63 . Test pressures can change with regulation so it is not a good idea to mark the gauge. Additionally any marking could affect the ability to read the gauge.
Charles Grenici	
Chromalox group	Do we need temperature gauges installed?
Jon Davignon	Not required for the test but it is a good idea to know if you are seeing temperature variance between incoming water, jacket, and cylinder
Charles Grenici	
Chromalox group	Do need a safety relief valve installed on the hydro test system
Jon Davignon	Galiso Hydro systems come with a safety relief valve for the air pressure. Adjustable regulators on the system allow you to adjust max achievable pressure for additional safety.
Chromalox group	Does each pressure test need a safety relief valve corresponding to vessel being tested?
Jon Davignon	Adjustable through air regulator
Chromalox group	Do the pressure gauges need periodical calibration?
Jon Davignon	Process gauge 6 months Master Gauge 1 year See CGA C-1 (2009) 5.3.2.2 and Appendix B
Chromalox group	Are there record requirements?
Jon Davignon	Keep calibration certificates and any check between process gauge and Master gauge
Chromalox group	Do we need to keep records of each hydrostatic pressure test (in terms of the hydro test system)?

Jon Davignon	Console components are typically replaceable so long term record of tests performed on unit does?
Chromalox group	Torque multiplier tool would be a big help
Chromalox group	Should there be a cycle limit and then require a PM?
Jon Davignon	Virtually everything is replaceable on the systems. They age with cycles and time. It is more based on whether the machine is performing as it usually does or not. It is wise to have a periodic maintenance of the equipment. Identify maintenance items on your system then establish maintenance criteria.
Chromalox group	At what pressure does human injury or illness become a concern?
Jon Davignon	Any pressure can be dangerous. Galiso systems are designed and tested over the last 50 years to safely test pressure the equipment is designed around. Sometimes the Manufacturers safety device are defeated to save money (metal burst disc instead of glass. Safety retainers removed,) This can make a system very dangerous. Knowledge of the system and its built in safety features is the best preventor.
Chromalox group	What PPE is needed? Are Lanyards needed? All hoses tied down? Shielding (lexan), protective equipment, guarding?
Jon Davignon	Steel toed boots, eye protection, hard hats are common in the major facilities. (Praxair , Airgas)
	bolts and couplers rated
Chromalox group	Are safety work permits needed for higher pressures?
Jon Davignon	No. Your possession of the RIN means you were able to meet the government requirements for testing the cylinders
Chromalox group	Safety and efficiency relating to: Gaskets?, Bolts - Torque?, Steelgard – In terms of safety, filtering and re-use ?
Jon Davignon	Galiso has a good track record for quality test components and building our systems for operator safety. Check regularly for wear and tear. Hi Pressure Connectors wear and should be replaced if not operating normally or have any visible wear.
Chromalox group	Should we have a drawing or specification table of the equipment and/or pipe line to ensure the Hydro Test System is designed to meet Pressure requirements?

Jon Davignon	You should have originally purchased a system with a given test pressure in mind. Sometimes however people “upgrade” their equipment on their own (higher pressure pump) so I would review original system documentation to see what the designed pressure for the unit is.
Chromalox group	How often do we need to inspect equipments and tools wear and damage? what do we need to inspect?
Jon Davignon	Constantly. Connections Hi Pressure, Low Pressure, Burst Discs, Head seal, Hi-pressure line from pump to hose connection. Excessive corrosion could be detrimental.
Chromalox group	Do we need to calibrate pressure measurement tools? How often ?
Jon Davignon	PID see CGA C-1 (2009) 5.3.2.2 and Appendix B
Chromalox group	Do gauges need to be rated at 150% of the maximum allowable working pressure.
Jon Davignon	CGA C-1 (2009) 5.3.2.2 and Appendix B
Chromalox group	Do pressure gauges need to be the safety type, with blowout back?
Jon Davignon	CGA C-1 (2009) 5.3.2.2 and Appendix B
Chromalox group	Are there standards for installing gauges at a proper locations?
Jon Davignon	CGA C-1(2009) has diagram on Page 5
Chromalox group	Do all temporary tools (such as valve, fitting, hoses, flanges, blind plate, etc) have to be rated higher than the maximum hydrostatic pressure?
Jon Davignon	Safety factors are dependent on what you are comfortable with. Typically the cheaper the console the lower the safety factor. If you wanted to be real safe testing 10,000 psi you could rate everything to 10x that pressure. However your testing would be slower and the components would be more expensive. 2x-4x safety factors are most common on the Galiso systems. Our high pressure hose has a burst pressure of 40,000psi. It is a 10,000 psi rated hose.
Chromalox group	Are there standards to isolate equipment and pipe lines that are not part of the hydrostatic test?
Jon Davignon	Local regulation
Chromalox group	Are there standards for proper installation of vents?
Jon Davignon	?
Chromalox group	Do vents need to be checked? What do you check for and how often?

Jon Davignon	?
Chromalox group	Are there standards for proper installation of drain valves? Do drain valves need to be checked? What do you check for and how often?
Jon Davignon	?
Chromalox group	Does the Safety relief valve need to be calibrated?
Jon Davignon	There is no requirement.
Chromalox group	Does the Hydro test area need to be completely cordoned off during a test? At what pressures?
Jon Davignon	Cylinders full of water are heavy. Part of the hydrotest is moving the cylinders in and out of the test jackets which requires lifting 400+lbs many times over the height of a persons head. Typical safety precautions should be enforced in this situation. Connections to these cylinders can wear over time, cylinders do burst in jackets. Thankfully much testing has been done at Galiso and we have built the system to contain a burst cylinder. Sometimes you see equipment damage but rarely is their injury to personnel. It is a good idea to keep the area clear of obstruction and people during the testing operation.
Chromalox group	Are there test pressures that should be performed remotely?
Jon Davignon	Yes
Chromalox group	Are there standards for water temperature?
Jon Davignon	For efficient operation maintain within 5 degrees between jacket, incoming water, cylinder.
Chromalox group	Does the hydrostatic-pressurizing pump need a safety relief valve?
Jon Davignon	Has air safety and regulator. Failure of the bleed valve normally results in lack of ability to build pressure. Pump shut off is located on the console as well.
Chromalox group	Are there standards for how quickly pressurization can occur?
Jon Davignon	Not that I am aware of.
Chromalox group	Are there standards for how quickly de-pressurization can occur?
Jon Davignon	Not that I am aware of.
Chromalox group	How to bleed system down when test is complete?
Jon Davignon	Operation manual
Chromalox group	Are there standards for Inert gas pressure testing?
Jon Davignon	?