

Authored By: Chris Lamb	Blanchard Refining Company LLC Galveston Bay Refinery	Doc No.: RSW-000006-GB Rev No: 3
Doc Custodian: Safety Supervisor		Refinery Safe Work Procedure
Approved By: H. F. Honor	EQ-3 Use of Hoses	
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TABLE OF CONTENTS

1.0	Purpose	2
2.0	Scope	2
3.0	Procedure	2
3.1	Responsibilities	2
3.2	Pre-use / Monthly / Biennial Inspection	2
3.3	General Requirements	3
3.4	Special Consideration for 300 Series Stainless Steel Hose	4
3.5	Contractor Supplied Utility Hoses	4
3.6	Red Air Hoses	5
3.7	Red Water Hoses	5
3.8	Black Steam Hoses	6
3.9	Red Blue Hydrocarbon Hoses	6
3.10	Yellow Nitrogen Hoses	7
3.11	Hot Nitrogen Hoses	7
3.12	Fire Water Utility Hoses	7
3.13	Chemical Hoses	8
3.14	Oxygen/Acetylene (combo pack) and Argon Hoses	8
3.15	Potable Water Hoses	8
3.16	Miscellaneous Hoses	8
3.17	New Hoses	9
3.18	Contaminated Hose-Decontamination and Disposal	9
3.19	Training	9
4.0	Definitions	9
5.0	References	9
6.0	Attachments	9
7.0	Revision History	10
	Attachment A – Hose Summary	11
	Attachment A – Hose Summary (continued)	12

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

1.0 Purpose

This procedure will help employees learn to use the proper hose for the service. This procedure is applicable to utility air, water, steam, nitrogen, and hydrocarbon drain hoses used within Galveston Bay Refinery (GBR).

2.0 Scope

This procedure discusses hose selection, limitations, hazards, and precautions associated with hoses. This procedure establishes minimum requirements for use by MPC employees and all contract workers using GBR utility hoses. Any hoses that are not stocked for routine use (special order, rentals, etc.) shall require that a MOC be completed by Operations prior to connecting to process equipment, and follow the guidelines outlined in the Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14. For temporary hard piping connections to process lines and vessels, see MPC RRD-1150-010 Utility Connections to Process Lines and Vessels for requirements.

3.0 Procedure

3.1 Responsibilities

- 3.1.1 **MPC Owning Department/ MPC Maintenance Department / Contractors** – Each MPC employee or contractor is responsible for visually inspecting any hose before installation and before use; for properly decontaminating, destroying, and disposing of expired, damaged or deficient hoses; for using only those hoses that have been properly tested and appropriately tagged; and for using the correct hose and connections for the intended service. Contractors who bring their own hoses on site shall have a documented hose inspection and disposal practice in place, with hoses that meet the minimum requirements of Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14.
- 3.1.2 **Fire Department** – Fire department personnel are responsible for administering the annual fire hose testing and inspection program.
- 3.1.3 **MPC Owning Department & Maintenance Supervision** – GBR supervision is responsible for communicating the conditions under which the hose(s) will be used, and obtaining appropriate technical/engineering input when needed; for ensuring that the monthly hose inspections are conducted; that expired, damaged or deficient hoses are decontaminated, destroyed, and disposed of.; that no hose is used for more than 30 days of continuous service; that an MOC is done for any hose to be used that is not covered in this policy and follows the guidelines outlined in the Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14.
- 3.1.4 **Marine Department** – Marine department personnel are responsible for administering the U. S. Coast Guard annual product transfer hose testing and inspection program.
- 3.1.5 **Supply Chain** – Purchasing/Warehouse personnel are responsible for hoses (including third party contractor and rental equipment) that conform to this practice.
- 3.1.6 **Vendor** – Vendors are responsible for ensuring that their products conform to Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14 and their biennial hose inspections conform to this practice.

3.2 Pre-use / Monthly / Biennial Inspection

- 3.2.1 Any hoses found to be defective or damaged shall be decontaminated, destroyed, and disposed of properly.
- 3.2.2 Visually inspect fittings for cracks, dents or any sign of damage.
- 3.2.3 Visually inspect hoses by rolling it out, checking outer cover for kinks, cuts, weather rot, and any other sign of damage.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

- 3.2.4 Verify tag on hose for expiration date.
- 3.2.5 Monthly hose audits must be documented by units and maintenance areas.
- 3.2.6 Biennial hose inspections and hydro testing will be conducted by the hose vendor/manufacturer. Each area will coordinate with the GBR warehouse and/ or hose vendor to get their hoses retested, inspected, and retagged as needed.

3.3 General Requirements

- 3.3.1 A silver tag shall be placed on all GBR owned utility hoses. The tag will include maximum pressure rating, temperature ratings and the expiration date of the hose.
- 3.3.2 All hoses may be re-inspected per the manufacturer. Contact the warehouse for more information.
- 3.3.3 Hoses shall be “walked down” with proper placement and connection being verified prior to use.
- 3.3.4 Any hose connected to process shall have an engineered check valve installed at the process connection to protect the hose and the ISBL header per the requirements of MPC RRD-1150-010 Utility Connections to Process Lines and Vessels.
- 3.3.5 If both ends of the hose will be connected to piping or equipment a bleeder shall be used per the requirements of MPC RRD-1150-010 Utility Connections to Process Lines and Vessels.
 - 3.3.5.1 Bleeders are not required if a vent or bleeder is open on the piping or equipment or if one end of the hose is left open in use, such as when washing down a unit.
- 3.3.6 When connecting and disconnecting utility hoses consider the temperature of the material inside the hose, its pressure, and any chemical hazard that may be present (acid, caustic, flammable, etc.).
 - 3.3.6.1 Wear the proper personal protective equipment (PPE) per the SDS.
- 3.3.7 GBR utility hoses may only be used for the service and rating reflected in **Attachment A**. All other hoses must follow the requirements listed in Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14.
- 3.3.8 Laying hoses across walkways should be avoided. When unavoidable, proper signs and/or barricades, and/or highly visible ramps/protective covers warning of a potential tripping hazard, shall be in-place.
- 3.3.9 Hoses shall not be laid on stairways or through ladder cages.
- 3.3.10 Hoses lying across roadways or pipe alleys shall be protected from damage.
- 3.3.11 Hoses will only be used for their intended service. Hoses will not be cross-connected to services for which they are not rated or intended.
- 3.3.12 Cross connections between the potable water system and any other system are prohibited.
- 3.3.13 Hoses shall be protected from abrasive surfaces, sharp objects, and mechanical damage.
- 3.3.14 Hoses shall be pressurized slowly to minimize the potential for abrupt failure.
- 3.3.15 Only a special order hose is approved for continuous service. Selection, installation, inspection, testing and replacement of special order hoses are covered by an MOC and shall follow the guidelines outlined in the Rubber and Corrugated Metal Hoses Refining Core Specification SP-50-14. Hoses not intended and approved for continuous service

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

shall not be used in continuous service (i.e., flow and/or pressure) for more than 30 days under any circumstance. An exception is granted for hoses contained on spools in shop areas (e.g., air hoses on spools in the machine shop).

- 3.3.16 All hose shall be connected in such a way, that the person disconnecting the hose may verify that the hose is depressurized, and the material in the hose is drained in accordance to GBR ENV-15 Maintenance, Start-up, and Shutdown (MSS) and TAR – Equipment Depressurizing, Degassing and Emptying.
 - 3.3.17 Marine product transfer hoses maintained in accordance with U.S. Coast Guard regulations are specifically exempt from this practice.
 - 3.3.18 Properly sized safety cable (whip check) shall be used as a whip arrestor for each pressurized hose greater than ¾” inches ID that has a quick connect or threaded connection.
 - 3.3.19 A safety cable (whip check) shall be used, whenever possible on, Ultra High Pressure (UHP) hoses. See GBR PR-38 Hydroblasting and Water Jetting for more information.
- 3.4 Special Consideration for 300 Series Stainless Steel Hose
- 3.4.1 Critical factors in chloride stress corrosion (Cl-SCC) cracking of 300 series stainless steel hoses are: Time, Temperature and Chloride Content. All three of these factors are required to cause cracking/ failure of 300 series stainless steel hoses. Thus, hoses with 300 series stainless steel braids and/or stainless steel corrugations cannot be used if all three factors below are present.
 - 3.4.1.1 Have been in service for more than two weeks. (Documented failures have occurred in less than 2 months of service).
 - 3.4.1.2 Operate at temperatures of 120°F or above.
 - 3.4.1.3 Are installed in contact with the ground and is exposed to a wet atmospheric condition.
 - 3.4.2 Alternatively, any 300 series Corrugated stainless steel hoses that meet the above criteria (3.4.1) can be replaced with appropriate piping or with hose that has both braids and corrugations made of Monel 400, Inconel 625, or Hastelloy C276 (or similar) in order to resist Cl-SCC.
- 3.5 Contractor Supplied Utility Hoses
- 3.5.1 Due to the possibility of cross connection between GBR supplied utility hoses/fittings and contractor supplied hoses/fittings and the risk of connecting contractor supplied hoses to services they are not intended for; fitting type for contractor supplied hoses shall not be the sole factor used for hose identification and service intent. The MOC performed by Operations prior to contractor supplied hoses being connected to process equipment shall note:
 - 3.5.1.1 The contractor supplied hose fitting to be used
 - 3.5.1.2 The service, pressure, and temperature ratings of the contractor supplied hose
 - 3.5.1.3 The color of the contractor supplied hose
 - 3.5.1.4 Any tags on the contractor supplied hose
 - 3.5.1.5 Any other distinctions or similarities with GBR supplied utility hoses
 - 3.5.2 This information shall be communicated to all Operations shifts as part of the MOC in the unit(s) where contractor supplied hoses are to be used. All contractor supplied hoses shall conform with specs listed in Rubber and Corrugated Metal Hoses Refining Core

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

Specification SP-50-14.

3.6 Red Air Hoses

- 3.6.1 Red air hoses use a Thor connection. (See Attachment A for hose summary)
- 3.6.2 To connect the hoses:
- 3.6.2.1 Push the ends together.
 - 3.6.2.2 Retract the THOR locking device.
 - 3.6.2.3 Turn the ends until locked/securely connected.
- 3.6.3 To disconnect the hoses:
- 3.6.3.1 Check both ends of the hoses to make sure they're not in use.
 - 3.6.3.2 Bleed off the pressure. Point the bleeder away from yourself and other people while you're relieving the pressure. Be prepared for liquids to spray out.
 - 3.6.3.3 Retract the THOR locking device. Turn the ends. Be prepared for liquid to run out. If the hoses have been connected to process equipment, read the SDS for the material inside the equipment and wear gloves and any other additional PPE based on the SDS.
 - 3.6.3.4 Pull the ends apart.
- 3.6.4 Air hoses may be used on portable air compressors, the plant air system, or the instrument air system: the high flow check valve must be installed where the hose connects.
- 3.6.5 All air hoses exceeding ½ inch ID that are used for power operated hand tools shall have a safety device (i.e., Excess flow valve) at the source of supply or branch line.
- 3.6.6 Air hoses used for cleaning may not exceed 30 PSI. Sealed eye wear and a face shield shall be worn when cleaning with compressed air. Pressurized air shall not be used when cleaning asbestos or lead.

3.7 Red Water Hoses

- 3.7.1 Red water hoses must have self-locking crow's foot fittings. (See Attachment A for hose summary)
- 3.7.2 To connect the hoses:
- 3.7.2.1 Push the ends together.
 - 3.7.2.2 Retract the locking Crows Foot device
 - 3.7.2.3 Turn the ends until securely connected.
- 3.7.3 To disconnect the hoses:
- 3.7.3.1 Check both ends of the hoses to make sure they're not in use.
 - 3.7.3.2 Bleed off the pressure. Point the bleeder away from yourself and other people while you're relieving the pressure. Be prepared for liquids to spray out.
 - 3.7.3.3 Retract the locking Crows Foot device. Turn the ends. Be prepared for liquid to run out. If the hoses have been connected to process equipment, read the SDS for the material inside the equipment and wear gloves and any other additional PPE based on the SDS.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

3.7.3.3.1 Pull the ends apart.

3.8 Black Steam Hoses

- 3.8.1 Black steam hoses (See Attachment A for hose summary) are used to carry:
- 3.8.1.1 Steam below 425 degrees F and pressure up to 250 PSI.
 - 3.8.1.2 Hot water and /or condensate above 190 degrees F, and pressure up to 250 PSI.
- 3.8.2 They require a fitting to join together.
- 3.8.3 Steam hoses specifically designed for 425 degrees F plus shall be specifically purchased and tested.
- 3.8.4 Steam hoses should be fitted with a steam lance (if practical) unless directly connected to process equipment.
- 3.8.5 Use a bleeder if the hose will be connected to piping or equipment, such as when steaming out a section of piping.
- 3.8.5.1 Bleeders aren't required if a vent or bleeder is open on the piping or equipment or if one end of the hose is left open in use, such as when letting steam blow onto a piece of cold equipment.
- 3.8.6 To connect the hoses:
- 3.8.6.1 Insert the fitting into the hose end.
 - 3.8.6.2 Turn the end by hand until tight and then tap the ears to ensure a tight fit.
- 3.8.7 To disconnect the hoses:
- 3.8.7.1 Bleed off the pressure.
 - 3.8.7.2 Tap the fittings and unscrew them.
 - 3.8.7.3 Once the hoses are nearly apart, tap the hose fitting again and loosen to allow remaining steam to escape.
 - 3.8.7.4 Hot condensate may form inside the hose and run out once the hoses separate. Keep the hose ends away from your face and body when you break the fittings apart and lower the end of the hose.

3.9 Red Blue Hydrocarbon Hoses

- 3.9.1 Red Blue Hydrocarbon hoses (See attachment A for hose summary) are used to move hydrocarbons.
- 3.9.2 Hydrocarbon hoses shall be rinsed (decontaminated) after every use.
- 3.9.3 Hydrocarbon hoses shall not be exposed to abrasive or hot surfaces.
- 3.9.4 Hydrocarbon hoses shall not be exposed to vehicle traffic.
- 3.9.5 To connect the hoses:
- 3.9.5.1 Insert the fitting into the hose end.
 - 3.9.5.2 Turn the connector end by hand until tight and then tap the connector knurls to ensure a tight fit.
- 3.9.6 To disconnect the hoses:
- 3.9.6.1 Block the source.
 - 3.9.6.2 Clear the line as well as possible.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

- 3.9.6.3 Make sure to bleed pressure.
- 3.9.6.4 Tap the fittings and unscrew them. Be prepared for liquid to run out.
- 3.9.6.5 If the hoses have been connected to process equipment, read the SDS for the material inside the equipment and wear gloves and additional PPE based on the SDS.
- 3.9.6.6 Pull the ends apart.

3.10 Yellow Nitrogen Hoses

- 3.10.1 Yellow Nitrogen hoses (See Attachment A for hose summary) are used to move Nitrogen.
- 3.10.2 Nitrogen stations must be equipped with a spring assisted check valve at the point of connection, and bleed valve per the requirements of MPC RRD-1150-010 Utility Connections to Process Lines and Vessels.
- 3.10.3 Use a bleeder if both ends of the hose will be connected to piping or equipment, such as when purging a vessel with Nitrogen.
- 3.10.4 Nitrogen hoses are equipped with a unique locking type mechanism on the connection fittings.
- 3.10.5 To connect hoses:
 - 3.10.5.1 Pull the locking mechanism back.
 - 3.10.5.2 Push the ends together.
 - 3.10.5.3 Turn the ends until locked/securely connected.
- 3.10.6 To disconnect the hoses:
 - 3.10.6.1 Check both ends of the hoses to make sure they're not in use.
 - 3.10.6.2 Bleed off the pressure. Point the bleeder away from yourself and other people while you're relieving the pressure. Be prepared for residue to spray out.
 - 3.10.6.3 Pull the locking mechanism back.
 - 3.10.6.4 Turn the ends. Be prepared for residue to run out. If the hoses have been connected to process equipment, read the SDS for the material inside the equipment and wear gloves and any other additional PPE based on the SDS.
 - 3.10.6.5 Pull the ends apart.

Note: When the use of Nitrogen is complete, promptly remove fittings from headers, bleeders, and any other connection points. Return the fittings to storage and install a bull plug in place of the Nitrogen fitting.

3.11 Hot Nitrogen Hoses

- 3.11.1 See Attachment A for hose summary
- 3.11.2 Shall be used to transport hot nitrogen from portable hot nitrogen equipment to process equipment.
- 3.11.3 Regular Yellow Nitrogen hoses shall not be used to transfer hot nitrogen.

3.12 Fire Water Utility Hoses

- 3.12.1 Using a fire hose to drain or transfer chemicals is **prohibited**.
- 3.12.2 Fire hoses shall only be used for water at ambient temperature, not to exceed 100 degrees F.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

3.12.3 Fire watch hoses may be either standard fire hoses or approved utility water hoses.

3.13 Chemical Hoses

3.13.1 Facilities that load and unload acids or caustics shall develop a written procedure for use during the loading/unloading process per the requirements of ROP-REFY 7000 *GBR Chemical and Bulk Delivery – Transfer Policy*. Facility personnel shall be trained in the proper use of the procedure.

3.14 Oxygen/Acetylene (combo pack) and Argon Hoses

3.14.1 See Attachment A for hose summary

3.14.2 The hoses covered in this section commonly operate far below their rated operating pressures.

3.14.3 The user shall visually check for cracks, cuts, or damage before each use.

3.14.4 Of the hoses covered in this section shall have unique fittings:

3.14.4.1 Oxygen female fitting/right hand fitting

3.14.4.2 Acetylene left hand fitting

3.14.4.3 Argon male fitting

3.14.5 Oxygen, Acetylene, and Argon hoses shall be service checked with plant air pressure to check for leaks following repairs or having a fitting replaced.

3.14.6 Oxygen hoses are normally operated at 40 to 50 psig. Acetylene hoses are normally operated at 6 to 12 psig. Argon hoses are normally operated at 30 to 40 psig.

3.14.7 Welding hose shall be fitted with a flame arrestor approved for all welding applications.

3.15 Potable Water Hoses

3.15.1 See Attachment A for hose summary

3.15.2 Potable water type hoses must be used for sanitation (includes hand wash stations) purposes only.

3.15.3 Hoses used to transfer potable water must be used for that purpose and labeled **“For Drinking Water Only”**.

3.15.4 Hoses shall conform to ANSI/NSF Standard 61 and must be certified by an entity (i.e. AWWA) recognized by the TCEQ commission.

3.15.5 Hoses and related accessories must be cleaned and disinfected at intervals that prevent build up during prolonged use and/or before start-up during intermittent uses.

3.15.6 Hoses must be properly stored between uses and must be provided with caps and keeper chains or have the ends connected together when stored.

3.15.7 No other hoses shall be connected to the potable water system.

3.16 Miscellaneous Hoses

Note: Please refer to Section 3-General Requirements for safe usage of hoses listed in this section.

3.16.1 See Attachment A for hose summary

3.16.2 Propane

3.16.3 Super Heated Steam

3.16.4 Xylene

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

- 3.16.5 Washed Crude
- 3.16.6 Ethylbenzene
- 3.16.7 Benzene
- 3.16.8 Toluene
- 3.16.9 0 – 50% NaOH
- 3.16.10 Unwashed Crude
- 3.16.11 Marine Cargo
- 3.16.12 NESHAP

3.17 New Hoses

3.17.1 The vendor will test and provide documentation of the hose testing and results for each hose. The warehouse will keep this information on the file for one year from date hose receipt.

3.18 Contaminated Hose-Decontamination and Disposal

- 3.18.1 Decontamination and disposal of all hydrocarbon and chemical hoses will be coordinated by the facilities/units with guidance from the MPC waste management field engineers.
- 3.18.2 All other hoses that are determined to be unable to be reused will be properly decontaminated and disposed of at a solid waste collection point as specified by waste management field engineers.

3.19 Training

The hose practice training schedule and frequency for MPC personnel will be in accordance with the HESS Training Matrix.

4.0 **Definitions**

- 4.1 **SDS** – Safety Data Sheet

5.0 **References**

- 5.1 Hose Manufacturers Technical Data Catalogs (File Maintained In Safety Department)
- 5.2 ROP-REFY 7000 GBR Chemical and Bulk Delivery – Transfer Policy
- 5.3 MPC RRD -1150-010 Utility Connections to Process Lines and Vessels
- 5.4 Detroit Utility Hose Guideline RSW-SAF-055-DT
- 5.5 GBR ENV-15 Maintenance, Start-up, and Shutdown (MSS) and TAR – Equipment Depressurizing, Degassing and Emptying
- 5.6 GBR PR-38 Hydroblasting and Water Jetting

6.0 **Attachments**

- 6.1 Attachment A – Hose Summary

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: EQ-3 Use of Hoses	Doc Number: RSW-000006-GB	Rev No: 3

7.0 Revision History

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Updated procedure and Attachment A to replace Continental Tan Hose with ContiTech Blue Green Hose and to reflect TRD and GBR Procedure Integration per PMOC M201710137-001.	R. K. Feters	J. G. Montminy	9/9/2017	11/13/2017
1	Technical Revision to Update Fittings for Air, Water, Steam, and Hydrocarbon Hose to reflect terminology used by vendor GHX, and color of Hydrocarbon Hose supplied by vendor GHX.	C. T. Lamb	J. G. Montminy	6-March-18	1-April-18
2	Updated to address various lessons learned including updated special considerations for stainless steel hoses, and requirements for contractor supplied utility hoses, under MOC 83600.	C. T. Lamb	E. R. Kaysen	11/6/2020	12/7/2020
3	Updated environmental procedure reference under MOC 93391.	M. K. Alberts	H. F. Honor	11/29/2021	11/29/2021

Attachment A – Hose Summary

Service	Color	Temp. (F)	Hose Type	Maximum Pressure	Construction	Connectors
Air	Red	-40 - 190 °F	Goodyear 250 Horizon	250 psig	Inner Tube: Versigard (EPDM)	Crimped Thor, Quick Connect
					Cover: Versigard (EPDM)	
Water (3/4")	Red	40 - 190 °F	Goodyear 250 Horizon	150 psig	Inner Tube: Versigard (EPDM)	Crimped Campbell Universallock Coupling (Self-Locking Crows Foot)
					Cover: Versigard (EPDM)	
Water (1-1/2")	Red	0 - 190 °F	Goodyear Horizon	200 psig	Inner Tube: Versigard (EPDM)	MXF Brass IPT
					Cover: Versigard (EPDM)	
Steam*	Black	0 - 425°F	Goodyear Flexsteel 250 Steam	250 psig	Inner Tube: Pyrosyn (special EPDM)	Campbell Viton Seal Ground Joint Male x Female Crimped /Boss
					Cover: Pyrosyn (special EPDM)	
Super-heated Steam	Black	450° - 650° F	Tubest Parrap With Male Pipe Nipple at Each End	150psig to Full Vacuum	Inner Tube: Flexible Metal	
					Cover: Corrugated stainless steel	
Nitrogen	Yellow	Ambient - 200°F	Goodyear Super Ortac	1000 psig	Inner Tube: Chemigum (Buna-N [nitril])	Perfecting V6F6-E-BR/6V6F6-E-BR Brass Crimped Check Valve, Bleed Valve
					Cover: Chemivic (Buna-N blend [Nitril-Vinyl])	
Hot Nitrogen (Special Order)	Red w/ yellow spiral stripe	Ambient to 368°F	Goodyear Plicord Steam Hose	250 psig	Inner Tube: Steel Wire	
					Cover: Pyrosyn Synthetic rubber	
Sellars Jet Hose	Green	Ambient to 225°F		1000 psig		
Firewater	Cotton	Amb. -100°F	As Specified By Fire Chief	300 psig	Inner Tube: Synthetic Rubber	Screwed 2.5 in or 4 in Fire Department Connection
					Cover: Woven Textile	
Hydrocarbon	Blue	-25 – 350°F	Continental ContiTech Blue Green Hydrocarbon	300 psig	Inner Tube: Black Nitrile	Campbell Hydrocarbon Viton Seal Female Ground Joints w/ HMS-3, HDS-3 Male Spuds
	Red				Cover: Wingprene	
Oxygen Acetylene (Combo PK) 1/4"	Green	Ambient to 190 °F	Matheson	200 psig		
	Red					

*This hose should not be used for superheated steam above 425°F or 250 PSIG.

Attachment A – Hose Summary (continued)

Service	Color	Temp. (F)	Hose Type	Maximum Pressure	Construction	Connectors
Argon	Green	Ambient to 190 °F	Anchor	200 psig		
Potable water	White	Ambient to 190 °F				Garden Hose fitting
Propane	Black	-20° - 120° F	Dayco L. P. Gas Service 7232 Carolina L.P. Gas Spec#8034-001	280 psig	Inner Tube: Black NBR	
					Cover: Textile Braid Black Rubber	
Xylene Washed crude Ethylbenzene Benzene Toluene 0 - 50% NaOH Unwashed Crude **	Blue	0° to 150° F	Goodyear Blue Flexwing Carolina	200 psig	Inner Tube: Spectar Polyethylene Synthetic Fabric w/ wire Helix	
					Cover: Versigard synthetic rubber	
Marine Cargo	Black	Ambient to 150° F	Goodyear 225 – SB Dock BF Goodrich Chemical & Sol Wilcox Marine-master 1151 & Vapor Recovery 1321	150 psig	Inner Tube: Cross linked Viton Synthetic fabric with steel wire helix	Flanged
					Cover: Polypropylene Galvanized carbon steel	
NESHAP	Orange	-450° to 650° F	321 UFBX With Male Pipe Nipple at Each End	150psig to Full Vacuum	Inner Tube: Flexible Metal	Male NPT
					Cover: Corrugated stainless steel	