



**MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM
STAGE II VAPOR RECOVERY
OPW BALANCE SYSTEM
MOPETP APPROVAL APCP-0002-001-99**

The Missouri Department of Natural Resources has established, pursuant to Missouri Air Conservation Law 643.010 through 643.620 and State regulations 10 CSR 10-5.220, "Control of Petroleum Liquid Storage, Loading and Transfer," the authority to approve systems and components designed to control gasoline vapor emissions displaced during the bulk fuel deliveries at gasoline dispensing facilities storage tanks (Stage I systems, a subpart of the total Stage II system) and for systems and components designed to control gasoline vapor emissions from motor vehicle fueling operations (Stage II vapor recovery).

OPW Fueling Components has requested approval of the OPW Balance System, and specifically, the OPW Balance nozzles # OPW 11VF, Extractable Vapor Valve # OPW 233 VM-2045, Swivel Fill Adapter # OPW 16SA-1020, Locking Fill Adapter # OPW 633LC-1000, Fill Cap # OPW 634TT-4, Float Vent Valve # OPW53FC-0046, Overfill Protection Drop Tube #OPW 61SO-400C, Spill Container #OPW 1-2100 & OPW 1-21PP, Vapor Recovery Adapter # OPW 1161AV-1620, Vapor Recovery Cap # OPW 1711T-7085, and Breakaway #OPW 66CL, for Stage I & II vapor recovery applications in Missouri. The OPW Fueling Components, Wayne Dresser Vista 390, Dayco Products, Inc., have also requested approval of their components listed in Exhibit 1, which were tested as part of the OPW Balance System.

OPW, Dresser Wayne, and Dayco have successfully completed California Air Resources Board (CARB) Certification testing and procedures on each of their vapor recovery product components prior to their application for Missouri approval.

The Balance system has successfully completed CARB Certification testing and procedures previous to its utilization in the Missouri approval testing. The CARB certification shall be incorporated by this reference, and all conditions, orders, limitations and testing requirements included in the CARB certification are made a part of this Missouri approval.

I, Roger D. Randolph, Director of the Air Pollution Control Program (APCP), find that, OPW, Dresser Wayne, and Dayco, have completed the required testing of components listed in Exhibit 1 under the Missouri Performance Evaluation Test Procedures, and result in a vapor recovery system which is at least 95% efficient for attendant and or self-serve use at gasoline dispensing facilities.

THEREFORE, the OPW Balance system is approved and recognized to be at least 95 percent efficient in attended and/or self-serve mode. Exhibit 1 of this order contains a list of the equipment approved for specific use with the OPW Balance system. Exhibit 2 contains Installation and Performance Specification for the equipment listed in Exhibit 1.

The maximum dispensing rate for installations of the OPW Balance system shall not exceed ten (10) gallons per minute in compliance with the limitation imposed by the United States Environmental Protection Agency as specified in the Federal Register, Volume 58, Number 55, page 16019.

The following requirements are made a condition of approval. The OPW Balance system shall be installed only in facilities which are capable of demonstrating on-going compliance, by applying for and successfully passing all Construction Permit and Operating Permit testing, vapor integrity requirements of the State APCP and cooperating Local Agencies, with jurisdiction over the installation. The owner or operator of the installation shall conduct, and pass a Static Pressure Decay test at least once for each Operating Permit renewal. The APCP Director or his designate may require this or any other applicable test in order to demonstrate compliance. *CARB certification requirements state the need for Static Pressure Decay tests once in each twelve (12) month period for some systems.*

The test shall be conducted in accordance with MOPETP MO/TP-201.3, "Determination of 2-Inch (WC) Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities." Further, the owner or operator of the installation shall conduct and pass Dynamic Pressure Performance Tests once in each twelve (12) month period. This test shall be conducted in accordance with MOPETP MO/TP-201.4, "Determination of Dynamic Pressure Performance of Vapor Recovery Systems at Dispensing Facilities." Alternative test procedures may be used if determined by the staff director to yield comparable results.

All components of the OPW Balance system shall be 100 percent performance checked at the factory, including checks of the integrity of the vapor path and the proper functioning of all automatic shut-off mechanisms.

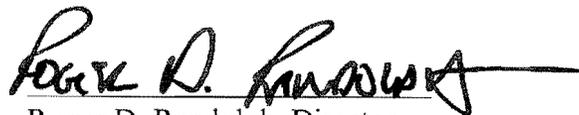
The approved Balance components shall, at a minimum, be operated in accordance with the manufacturer's recommended maintenance intervals and shall use the manufacturer's recommended operation, installation, and maintenance procedures.

The approved Balance system components shall be performance tested during installation for ability to dispense gasoline and collect vapors without difficulty in the presence of the station operator, owner or designated person. The owner, operator, or designated person shall be provided with copies of the installation and maintenance manuals for the components to be maintained at the gasoline dispensing facility, and shall also be provided with instructions in the proper use of the Balance system, their repair and maintenance, where and how the system and/or components replacements can be readily obtained.

The approved Balance system components shall be warranted in writing for at least one year from the time of sale to the ultimate purchaser and each subsequent purchaser, that the vapor recovery system components are designed, built and equipped so as to conform at the time of original installation or sale with the applicable regulations and is free from defects in materials and workmanship which would cause the vapor recovery system to fail to conform with applicable regulations. Copies of the manufacturers' warranty for the system components shall be made available to the station manager, owner, operator, or designated person.

Any alteration of the equipment, parts, design, or operation of the systems or components as tested in the MOPETP and thereby approved is hereby prohibited and deemed inconsistent with this approval, unless such alteration has been previously approved by the Staff Director of the APCP or his or her designated person.

Executed at Jefferson City, Missouri this 24th day of MAY, 19 99.



Roger D. Randolph, Director
Air Pollution Control Program

Attachments: Exhibit 1, 2

EXHIBIT 1

**HUSKY BALANCE SYSTEM
COMPONENTS BY MANUFACTURER
MOPETP APPROVED COMPONENTS**

Manufacturer	Model	Component Name
Husky Corp.	5010 V short	Nozzles
	5210 V long	
	4620	Pressure / Vacuum Valve
	3360 VR	Breakaways
OPW Corp.	233 VM-6045	Vapor Valve
	633T-8076	Fill Adapter
	634TT-7085	Fill Cap
	53-VSS-0046	Float Vent Valve
	61SO-400C	Overfill Protection Drop Tube
	1-2100 (Plugged)	Spill Bucket
	1611AV-1620	Vapor Recovery Adapter
	1711T-7085	Vapor Recovery Cap
Gilbarco Corp.	Advantage Series 5+1 B7D	Dispensers
Dayco Corp.	V2000 Petroflex 2000 Model 7574BTF	Vapor Recovery Hoses
	2000 Petroflex 2000 Model 7574BTN	
Goodyear Corp.	Maxxim Permier Plus	
	Maxxim Permier	

The above components of the Husky Balance system are approved for use in gasoline dispensing facilities which require approved Balance Vapor Recovery systems. As additional Balance Vapor Recovery Equipment components become MOPETP approved, all approved Balance components will be available for use in all future Balance Systems. The Balance system and various components approval is contingent upon compliance with all CARB certification requirements and the following Missouri MOPETP requirements. The MOPETP requirements are listed on

EXHIBIT 2 Performance & Installation Specifications

OPW 11 VF Nozzles

OPW 11 VF nozzles are approved for use with other approved balance system equipment in the State of Missouri. The nozzles attained a greater than 95% efficiency during one of the most difficult times of year for such testing. The nozzles performed well over the 180-day period of testing except in relation to the vapor valve opening at times when inserted into the Wayne Vista 390 nozzle pockets. All nozzles must have a serial number attached to the nozzle.

The installation instructions for these nozzles MUST include a notice that when used with the Wayne 390 Series dispenser (or any other dispenser using the same nozzle pocket design) that the nozzle pocket must be modified such that the bellows is not depressed allowing the vapor valve to open. If the nozzle bellow must be adjusted in order to pass the leak decay test, then the nozzle may not be installed with that dispenser.

If during operational permit testing, OPW 11 VF nozzles routinely have problems passing either the leak decay or pressure decay tests, then OPW will be notified and the problem must be resolved with immediate and long term corrective actions.

The nozzles should be used with components with back pressures such that the total system back pressures will be within the criteria listed in Table 2-1. A summary of the average back pressures of each component can be found in Table 2-2.

Table 2-1. MO/PETP Back pressure criteria.

Flow (scfh)	40	60	80
Back Pressure ("WC)	#0.16	#0.35	#0.62

**Performance & Installation
Specifications
Continued**

Table 2-2. Summary of Average Back Pressure Data

(all data from the pretest except the nozzles).

Component	Model	Backpressure ("WC)			Number Tested
		40 cfh	60 cfh	80 cfh	
Dispensers	Wayne Vista 390 V390U D4 GQUY	0.072	0.129	0.215	6 (12 points)
Nozzles (Pretest)	OPW 11VF	0.018	0.052	0.094	12
Nozzles (Post test)	OPW 11VF	0.025	0.069	0.118	11
Hoses	Dayco V 2000	0.033	0.070	0.108	12
Breakaways	OPW 66 CL	0.003	0.007	0.009	12
Whip Hoses	Dayco 2000	0.013	0.028	0.045	12
System		0.127	0.253	0.360	12

OPW 66 CL Breakaways

OPW 66 CL Breakaways are approved for use with other approved balance system components in the State of Missouri. These breakaways must be manufactured, sold, and installed exactly as tested at the MO/PETP site. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC. The breakaways should be used with components with back pressures such that the total system back pressures will be within the criteria listed in Table 2-1. A summary of the average back pressures of each component can be found in Table 2-2.

Wayne Vista 390 (V390U D4 GQUY)

Wayne Vista 390 series dispensers are approved for use with other approved balance system components. The Vista 390 series dispensers (vapor equipped/vapor ready) models are all included in this approval as long as the model chosen has a backpressure equal to or less than the model tested (V390U D4 GQUY). The Wayne Vista dispensers must be manufactured, sold, and installed as tested at the MO/PETP site. The dispenser must be installed such that there are no constrictions in the connections between the dispenser vapor piping and the underground piping.

Performance & Installation Specifications *Continued*

It is preferred that the dispensers are installed with all vapor piping preinstalled by the manufacturer (suffix GQY). However, vapor ready systems (suffix GQUY) may be installed IF all vapor piping and connections installed by the contractor are the same as those materials used by the manufacturer. It is the responsibility of the contractor to assure that proper vapor piping and other components are used in installing the dispenser. It is the responsibility of the manufacturer to make clear in the installation instructions manual the proper requirements for the vapor piping.

The Wayne Vista 390 dispensers must be supplied with the appropriate modification kit (P/N 918942M-Kit) when used with the OPW 11VF nozzles or other long spout nozzles as described in the Wayne Installation Manual. Use of this dispenser with other long nozzles may require use of other specific modification kits as described in the Wayne installation documentation. The nozzles must not be adjusted in the pockets before the Leak Decay test; if such adjustment is needed before the system can pass the Leak Decay test, then the nozzles may not be used with the dispenser. If during operational permit testing, the Wayne 390 series dispenser routinely have problems passing either the leak decay or pressure decay tests, then Wayne will be notified and the problem must be resolved with immediate and long term corrective actions.

The dispensers should be used with components with back pressures such that the total system back pressures will be within the criteria listed in Table 2-1. A summary of the average back pressures of each component can be found in Table 2-2.

OPW 523V-2203 Pressure/Vacuum (P/V) Valves

OPW 535V-2203 P/V Valves are approved for use with other approved balance system components in the State of Missouri. Both the threaded and slip-on models were tested. These P/V valves must be manufactured, sold, and installed exactly as tested at the MO/PETP site and be able to pass the same test criteria. The P/V valves must be stamped with a model number and date code. The P/V valves must be installed according to the instructions. No pipe dope should be used to install the P/V valves. Care must be taken when checking for leaks around P/V valves that no soap gets into the valve. Such soap prevents the valve from opening properly. The slip-on models must be held down firmly before tightening. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC.

If during operational permit testing, the OPW 535V-2203 P/V Valves may routinely have problems passing either the leak decay or pressure decay tests, then OPW will be notified and the problem must be resolved with immediate and long-term corrective actions.

**Performance & Installation
Specifications
*Continued***

OPW Spill Container 1-2100 with Drain Valve

OPW Spill Container 1-2100 with Drain Valve is approved for use with other approved balance system components in the State of Missouri. These spill containers with drain valves must be manufactured, sold, and installed exactly as tested at the MO/PETP site and be able to pass the same test criteria. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC. While these spill containers did not appear to cause significant leaking during the 180 durability test, there is still more potential over the years for these spill containers to develop leaks than for the plugged spill containers or those built with no valve openings. Thus, the recommendation is that spill containers that are plugged or have no drain hole should be used.

OPW Spill Container 1-21PP with Drain Valve Opening Plugged

OPW Spill Container 1-21PP with Drain Valve Opening Plugged is approved for use with other approved balance system components in the State of Missouri. These spill containers with no drain valves must be manufactured, sold, and installed exactly as tested at the MO/PETP site and be able to pass the same test criteria. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC. These spill containers are preferred over those with drain valves because of the greater possibility of leaks over the years for those with drain valves.

OPW Swivel Fill Adapter 16SA-1020

OPW Swivel Fill Adapter 16SA-1020 is approved for use with other approved balance system components in the State of Missouri. These fill adapters must be manufactured, sold, and installed exactly as tested at the MO/PETP site and be able to pass the same test criteria. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC. There did not appear to be the same problems with these adapters being loosened during bulk fuel deliveries as with the OPW 633T-8706 fill adapters tested during the Husky MO/PETP. Thus, it is recommended that the locking clamp or swivel adapters be used.

OPW Locking Clamp Fill Adapter 633LC-1000

OPW Locking Clamp Fill Adapter 633LC-1000 is approved for use with other approved balance system components in the State of Missouri. These fill adapters must be manufactured, sold, and installed exactly as tested at the MO/PETP site and be able to pass the same test criteria. Any modifications will need [at a minimum] an engineering evaluation and review by the TRC. There did not appear to be the same problems with these adapters being loosened during bulk fuel deliveries as with the OPW 633T-8706 fill adapters tested during the Husky MO/PETP. Thus, it is recommended that the locking clamp or swivel adapters be used.

**Performance & Installation
Specifications
*Continued***

GENERAL GUIDELINES

At this time, several Balance system vapor recovery equipment manufacturers are conducting MOPETP tests for approval. As additional Balance system components are approved, those components will be approved as alternates to these components. The APCP foresees a wide selection of Balance system components available within the next year. These various approved components will be available to "mix and match" to other approved Balance components.

Back pressure is a critical issue in Balance systems. It has been estimated that for each additional 0.1" WC back pressure the system will lose 1% efficiency. Careful judgement should be taken to ensure that the components selected will result in total system back pressures within the acceptable limits. An example would be that during the Husky Balance MOPETP, one hose manufacturer had to be eliminated due to excessive hose back pressure. The general guideline for back pressure sharing is 1/3rd for the hanging gear, 1/3rd for the dispenser, 1/3rd for the underground plumbing and UST.

APPENDIX A

The Missouri Department of Natural Resources Air Pollution Control Program approves the equipment listed in the table below (Appendix A, B, C), subject to the terms and conditions of the Balance system approval listed on the MOPETP Approval APCP-0002-001-99.

List of components of an OPW Stage I EVR system.

Part Number	Evaluation Method	Description
61VSA-1020-EVR	Tested	Vapor Swivel Adapter, Bronze, Bronze
61SALP-1020-EVR	Tested	Fuel Swivel Adapter Low Profile, Bronze, Bronze
634TT-7085-EVR	Tested	Dust Cap, Product
1711T-7085-EVR	Tested	Dust Cap, Vapor
634LPC -0400	Tested	Dust Cap, Low Profile Product
1711LPC-0300	Tested	Dust Cap, Low Profile Vapor
FSA- 400, -400-S	-400 tested, -400-S reviewed	Face Seal Adaptor
61JSK- Series	-4410 tested, -4400-EVR & -44CB reviewed	Jack Screw Assembly for drop tubes
53VML- Series	-0120 (2" diameter and 12" long) and -3050 (3" diameter and 5" long) tested	Ball Float - 2" and 3" with various lengths
233- Series	-4432 tested	Extractor Valve - (Tee and Cross)
62M - Series	-0375 tested	Monitoring Cap - 4" Threaded
71SO-Series	-400C tested	Drop tube w/ Overfill Prevention valve. Various lengths
61T- Series	-7268 tested	Drop tube, Straight. Various lengths
Husky: 4885	Tested	Pressure Vacuum Vent 3" H2O pres., 8" H2O vac, 2" thread-on
OPW/Pomeco 6111-1400-EVR	Tested	Tank Bottom Protector (optional)

APPENDIX B

Details of Spill Container component designations

Spill Containers & Cover TTT-21WWX- YZZZ	1-2100-DEVR and – PEVR tested	TTT- Indicates spill bucket material /Cover type: 1 = Aluminum 1C = Cast Iron 1SC = Sealable Al. Cover with expandable seal
		WWW- indicates bucket size 00 = 5 gallon 15 = 15 gallon 00E = 7 gallon
		X – indicates C = Cast iron Base No lettering for composite base
		Y- indicates drain valve or plug D = Drain Valve P = Plug
		ZZZ – indicates configuration EVR = Standard spill bucket SH = self supporting ring and cover for Multi-Port

Details of Multi-Ports

Multi-Ports 65QQEVR-R-SS-TT- UU-VV-WW-XX-Y-Z	Not tested but reviewed	QQ – indicates spill bucket material / cover type: 11 = composite base, bolted down cover 21 = composite base, roto-lock cover 61 = Cast iron base , bolt down cover 71 = Cast iron base , roto-lock cover
		WW – indicates spill container cover style RT = Rain tight SC = Sealable cover
		XX – indicates spill container capacity in gallons 05 = 5 gallon 07 = 7.5 gallons 15 = 15 gallons
		Note: The “6” prefix in the part number is OPW’s designation for a complete multi-port manway assembly. “R”, “SS”, “TT”, “UU”, “VV”, “Y” and “Z” designates manway design characteristics not required to be certified as part of the vapor recovery system cer

APPENDIX C

Details of Secondary Contained Spill Containers

Secondary Contained Spill containers 5VVL- WW20XXYY1Z	Not tested but reviewed	VV - indicates base configuration 11 = Composite 61 = Cast Iron
		WW - indicates connection configuration RM = Remote fill 00 = Direct fill
		XX - indicates spill container cover style RT = Rain tight SC = Sealable cover
		YY - indicates spill container capacity in gallons 05 = 5 gallons 07 = 7 gallons
		Z - indicates drain valve configuration P = Plug (Vapor) Blank = Drain valve (Fill)