

# WHITE PAPER

## *“Why Buy the Original DRYVac™ Vapor Recovery System”*

### **Executive Summary**

There is only one original DRYVac™ Vapor Recovery System. It was developed and perfected by SYMEX Americas. Any others claiming to offer “DRYVac™” are offering imitations, not the original real DRYVac™. DRYVac™ has a 99.6% uptime record across the board, with the 0.4% downtime devoted to planned preventive maintenance. All imitation systems have dramatic failure and downtime records. DRYVac™ is at least ten years ahead of all others, insuring its uptime reliability. When asked the question, “Why buy the original DRYVac™?” the answer is, “When you buy the best, you get what you paid for!”

### **Introduction**

Selecting the original is often the preferred method when it comes to critical operations. While some folks take their cars to the local mechanic, and allow him to use aftermarket parts that may not perform quite like the OEM parts from the dealership, others of us choose to “go for the gold”, using only OEM parts. If you’re in the latter category, please read on. If not, simply save yourself some time and trash this paper now.

### **The First Dry Vapor Recovery System**

The dry vapor control concept was born in the mind of a very brilliant engineer in the early 1990s. He had worked for one a large firm in one of its European offices. His firm was known to control the global vapor recovery (VR) market at that time. They had purchased the firm that had first developed the VR technology as it was then. That firm had been their only competitor. This man knew the validity of the original technology, and he also knew its weaknesses. In an effort to improve it, he made two proposals to management, 1) replace the liquid ring vacuum pump with a dry screw pump, and 2) integrate the use of computers and its limitless software. His ideas met with severe resistance. They were in conflict with the developed and proven “standards” the large firm had so arduously developed. The use of standards meant that little or no tailoring had to be done from project to project, thus profits could be maximized. So, his ideas were rejected. They did not die, however.

At the same time a local client needed a tailored VR system for an unusual chemicals application. The large company had no standards that fit the application. Frustrated by

his recent rejection, the engineer sought employment in a firm that would support his new ideas. He found such a firm, and tailor made the world's first dry vapor recovery system to meet the client's specific needs. It worked, but like many new concepts, not as planned. The dry screw vacuum pumps failed to perform to their published performance curves, and soon began to fail mechanically. It seems their hollow rotors collected solid deposits inside their cavities. These deposits created an out-of-balance condition. This caused the 30,000 hour shaft bearings to fail in a matter of weeks.

This combination of problems might have steered many lesser people away from this development effort. But such was not the case here. Undaunted, this engineer simply sought out a better pump. He found that no dry screw vacuum pump was available that had been designed for the unusual process conditions in this application. However, he found that the world's leading manufacturer of high-tech vacuum pumps, a German firm, was willing to develop such a pump specifically for this application. Within a year these new pumps were operating in new dry VR systems all over Europe.

Once the vacuum pump problems were solved, this engineer turned to the subject of computerized automation. This proved to be a daunting task. In the mid-1990s there were very few people with any industrial computer software development experience in Western Europe. Once such firm was identified in France, and the work was begun. Even though over 800 VR systems of the original technology existed with General Electric (GE) software and GE industrial micro-computers, this engineer chose to use Siemens, the most reputable electronics firm in Europe. The French software development firm was familiar with Siemens software, so Siemens was the logical choice. Little by little the software was developed and was married with the necessary input instrumentation to complete the functional process offering. As time wore on it became more and more apparent that the software developer lacked the process experience necessary to write the needed software logic, so patches were installed to solve the many problems as they occurred. It didn't take long for the program to grow in size and complexity to the point where no one had a full comprehension of how it worked, or why it didn't. By the end of the eighth anniversary of the new dry system the initial problems with the first (failed) dry vacuum pumps, and the many ensuing difficult software issues, saw the entire effort come to an untimely end in bankruptcy. It had become another in the long line of technical industrial successes and economic failures.

### **The Original DRYVac™ Vapor Recovery System**

With the demise of the founding firm, Symex S.A., headquartered in France, SYMEX Americas had a decision to make. SYMEX Americas, an American firm headquartered in

Indianapolis, Indiana in the USA, had been formed originally to assist the founding company in marketing dry vapor recovery systems in the western hemisphere only. With the demise of Symex S.A. the management team of SYMEX Americas decided to assume the role of developer and purveyor of the dry vapor recovery technology to the world market from that point forward.

SYMEX Americas had built one system for Symex S.A. in the USA at this point. Symex S.A. had provided the software and SYMEX Americas had provided the remainder of the system. The USA client in this case was dissatisfied with the Siemens software package from Symex S.A., as the USA standard for the 600+ US vapor recovery systems was and remains the General Electric platform. For this reason, SYMEX Americas realized the necessity of developing a new software package. To meet this challenge, SYMEX Americas assembled a group of industry experts and assigned the task of developing a brand new software package. The initial goals were:

1. Develop an operating system that would first and foremost be reliable, reducing downtime from the traditional 5% or more to less than 1% in all cases.
2. Design the software so the overall operation would be as "green" and energy efficient as possible, eliminating all unnecessary consumption of operating energy all the time.
3. Develop operating algorithms so the system would monitor all of its operating variables and, using the input from these monitors, manage itself to eliminate the need for client personnel to become expert in its operation.

The mandate was to accomplish these goals without regard for the added cost of instrumentation, based on the premise that the client base is so experienced and well informed about the deficiencies of previous systems from others that these improvements would be appreciated and welcomed by all. This prophecy has held true.

Additionally, the affiliation between Symex S.A. and SYMEX Americas had existed long enough for SYMEX Americas to glean the development pitfalls Symex S.A. had suffered. This proved to be invaluable going forward, as SYMEX Americas was able to leverage its design expertise off of the knowledge gained in over ten years of Symex's development efforts. This gave SYMEX Americas a ten year "jump" on any would-be competitors.

Within six months SYMEX Americas had constructed and shipped its first completely new, USA designed "from the ground up", DRYVac™ System. Because of constant rains, the site installation, commissioning, and start-up took about five weeks, 3-4 weeks longer than would soon become the norm. This would be the very first fully instrumented vapor recovery system in the western hemisphere, and **the world's first true DRYVac™**. This system was designed for 16,500 GPM gasoline and diesel fuel

loading. It has two Busch Cobra 1000 dry screw vacuum pumps. Every flow is measured and transmitted to the PLC. Every pressure is measured and transmitted to the PLC. Every temperature is measured and transmitted to the PLC. For the first time ever, all of the operating data necessary for a system to manage itself was finally in place. And it has the software to match.

The DRYVac™ software package, known as ESP™, has three distinct and different layers of ladder logic.

- Level 1: This is the most basic operating logic, allowing the DRYVac™ system to run and operate whenever a truck is carded in at the loading rack. This is the way the first generation vapor recovery systems operated, so it is completely familiar to anyone who has prior knowledge of the root technology. Additionally, it uses input from all instruments, valves, and controls to maintain the safety and integrity of the system.
- Level 2: This level represents a more intelligent, energy efficient approach to normal VR system operations. Rather than assuming the entire system needs to run whenever there is a truck in the rack, as is the case in Level 1, Level 2 software counts the trucks as they come and go through the loading terminal. The software is programmed to calculate the mass of hydrocarbons entering each carbon bed based on the fixed volume and concentration constants for the vapors coming from each truck. The software is pre-programmed with the maximum mass of carbon adsorption allowable during each regeneration cycle. When the calculated mass of hydrocarbons is adsorbed the software triggers a bed change and regenerates the carbon. This allows the DRYVac™ to operate with more energy efficiency than in Level 1. The DRYVac™ regen system will remain off until the process demands it run, reducing operating costs, minimizing wear and tear, and adding to system longevity and reliability.
- Level 3: This level is the most intelligent, most sophisticated, and the most energy efficient. In this level the instruments feed the PLC and its software with the precise information it needs to calculate the actual mass of hydrocarbons being loaded onto the activated carbon. There are no assumptions in this software level. The computer calculates the real inlet hydrocarbon mass in real time, several hundred times each second. The accuracy of the data is unparalleled. Now, when trucks are loaded with low RVP diesel, for instance, the low vapor phase hydrocarbon concentration adds very little to the adsorption capacity of the carbon and each regeneration sequence is delayed accordingly. Likewise, when a truck returns to the terminal with a low concentration of

gasoline vapors, the same scenario takes place. The software accumulates ONLY the REAL total mass of hydrocarbons. This results in a concrete and dramatic reduction in energy costs, delaying energy intensive regenerations as long as possible, and makes DRYVac™ the most energy efficient vapor recovery system available.

There are many other software, electronic, and hardware features and follow-up that separate the original SYMEX Americas DRYVac™ vapor recovery system from all others, and the list continues to grow.

Here are some of the more important and impressive features of the one and only ORIGINAL DRYVac™ Vapor Recovery System:

- DRYVac™ is ONLY designed and manufactured by SYMEX Americas. Any others using this name, or claiming to be offer these system, are misleading you and only offering their attempt to copy or clone the DRYVac™ System. Those are not DRYVac™, and none can prove performance even close to the original DRYVac™.
- DRYVac™ has a 99.6% uptime record. This exceeds the best alternate technology by 500%! DRYVac™ never shuts you down!
- DRYVac™ was the very first fully automated, self-managed, completely dry vapor recovery system in the world.
- DRYVac™ has the lowest maintenance requirement of any VR System ever built.
- The FlowMax™ carbon used in every DRYVac™ System lasts the life of the system. No client has EVER had to replace FlowMax™ carbon!
- SYMEX Americas monitors every DRYVac™ System every week for the life of the system at no additional cost to the owner. This keeps expert eyes on every system every week, keeping each one running as it should.
- SYMEX Americas builds DRYVac™ Systems and nothing else. We do not dilute our staff with other ventures. We focus 100% of our time and attention on DRYVac™, upgrading it constantly, keeping it the very best VR System in the world.

## Conclusion

When you buy the original DRYVac™ Vapor Recovery System you're buying the best vapor recovery system in the world ... and you're getting what you pay for!