THE RIGHT PART

Using non-OEM parts in pumps and fittings can create unintended changes in how the products operate, and potentially dangerous situations. Here's how to avoid that scenario

Certain product types need service and part replacement due to poorly maintained water chemistry, excessive load, or other factors. During service it's important to use original equipment manufacturer (OEM) replacement parts and components. Use of non-OEM parts or parts not specifically intended and certified for a product can create unintended changes to a product and its performance. Since 2008 there have been many changes to suction fitting installation piping, sumps, mounting and adapter fittings, or cover-grates. These changes can significantly impact performance of a suction fitting. This issue has received much greater attention and awareness of the potential negative impact that not following manufacturer instruction or use of non-OEM parts could create.

In the last few years there has been greater interest in making pools and spas more energy efficient. There are many ways to improve efficiency, (pool covers, better wall insulation, reduced flow rates, larger diameter piping, longer sweep elbow fittings, different chemical delivery and monitoring systems, etc.). Most efficiency improvements require changes in design or equipment, which adds initial cost. Some changes can be made as part of service and repair, but some cannot be easily made after a pool is built.

Let's consider one example of non-OEM part replacement, such as changing a pump to run at a lower rpm or use a different impeller, etc. Before considering the issue, it's helpful to know how pumps are tested and certified by NSF:

- Material health, safety, & corrosion resistance evaluation
- Physical evaluation of design, markings, user manual & instructions
- Hydrostatic pressure testing and 1.5x maximum working pressure
- Strainer, design evaluation and testing
- Motor evaluation for 10% full load voltage variation, thermal protection, marking, etc.
- Performance curve (pump curve) determination
- Self-priming test
- Pump energy efficiencey testing (per California Energy Efficiency requirements)
- Pump sound emmission testing

Use of replacement pump motors, changes to a pump impeller, or changes to connection fittings on an NSF Certified pump could yield a different pump curve, different conditions of flow, pressure and vacuum in the circulation system as well as other impacts upon pump compliance with NSF 50 requirements. Such changes may seem unimportant, but they can be very important when you consider the entire water circulation system and the impact of pump modification upon filters

DO YOU REALLY KNOW PVC?

Many pool builders and installers don't know how to differentiate between pressure piping materials and products. One of their biggestconcerns is having tough piping and making strong field joints that won't leak when assembled, backfilled, and put under a long life ofhigh chemical exposure and varying pressure conditions. Builders/installers have great faith in the performance of their PVC pipingproducts, but few people understand why these products are so reliable, and how this system is maintained. To begin, you need to understandthe marking on PVC piping products such as the rigid PVC piping. In addition it helps to know the history and infrastructure that hashelped to create such a well know, trusted and reliable product. This information will help you wisely choose your products and materials to fit the installation conditions.

What does the print strip on PVC pipe mean?

Let's decipher the marking on some rigid NSF Certified PVC Pipe, Specifically, 2" PVC rigid pipe tested and certified to NSF/ANSI

Standard 14 and ASTM D1785 for potable water end use. PVC is an acronym for the primary ingredient in the plastic compound, called poly vinyl chloride. As noted in its name, PVC contains chlorine and chlorine is a primary water disinfection and treatment chemical. PVC has a long track record of strong performance in pool and spa applications where acids, bases, sanitizers, and salts can be very aggressive and damage other material types. PVC was discovered in the mid-1800s by French and German chemists, but it wasn't used commercially until the early 20th century. Further development with additives in the 1920s yielded greater ease of processing. This set the stage for many uses of PVC in consumer and industrial product applications.

What is NSF/ANSI Standard 14 or the NSF-pw Mark?

NSF/ANSI Standard 14 was created by NSF working with plastic piping manufacturers, public health officials, and product users to create a criteria or standard that would broadly encompass the many types of plastics, pipes, and fittings used for drinking and sewer piping. The work on this project began at NSF in 1950's during the infancy of the plastics and polymer industries in the US. The work culminated in the 1964 issue of NSF Standard 14. This standard has grown and expanded to address virtually every end use of plastic piping such as reclaimed water, gas piping, fire supression piping, radiant floor heating, etc.

Today, such products are tested at NSFs world headquarters, in Ann Arbor, MI. where 600 staff perform product testing at our 125,000 square foot laboratory. The largest portion of piping products tested are for pressurized potable water use ie NSF -pw. NSF-pw pipe is the most commonly used piping for pool, spa, waterpark water treatment and circulation system plumbing. Most common plumbing products can be found under NSF/ANSI Standard 14-Plastic Piping and Components, while more specialized pool industry fittings and products are found under NSF/ANSI Standard 50-Recreational Water Products.

The marking or printing on the product contains the following details at intervals of 5 feet on the outside of the pipe:

1. Nominal size or diameter of the pipe or tubing
2. Type of plastic material ie PVC 1120, this 7 digit code means the pipe is made from Type 1, Grade 1 PVC material with a 'cell class' of 12454-B as determined in accordance with ASTM D1784, the "20" part of the PVC 1120 is a 2 digit abbreviation of the material HDS or hydrostatic design stress of 2000psi, expressed in units of 100psi. PVC 1120 is generally considered the highest or strongest grade of PVC with others such as PVC 2116, PVC 2112, PVC 2110 having lower HDS ratings.
3. Schedule (such as Sch 40-thinnest wall, Sch 80, or Sch 120-thickest wall, the thicker the wall, the greater pressure the pipe can sustain)
4. Pressure rating such as 200psi at 73F.
5. Production code which the manufacturer can use to trace the year, month, day, shift, production location, and extruder that made the pipe.
6. Product standard(s) to which it was certified such as ASTM D1785
7. Trademark of Name of product manufacturer
8. Certification Mark of the lab/certifier such as NSF-pw.

The NSF-pw marking on pressure pipe means:

- The piping materials were evaluated and tested by NSF for long term pressure strength,
- The final product (the pipe) was tested at NSF for
- Health safety testing in accordance with NSF/ANSI Standard 61 (Health Effects-Drinking Water), and
- Performance based upon dimensional, short term burst, regression, flattening, and 1000 hour pressure tests.
- NSF performs 3 or more unannounced annual factory audits at pipe production locations to ensure products continue to comply
- NSF conducts annual performance and health effects testing on piping products

The NSF Mark NSF-pw on PVC pipe is your proof that the product and its materials have been thoroughly evaluated, tested, and audited to the most stringent requirements. As you can see from the above history and details, NSF has worked with the industry to make PVC a strong and reliable choice for pool, spa, and waterpark piping.

that require a certain flow rate and pressure to operate efficiently, ozone and UV systems as well as electrolytic, mechanical, and flow through chemical feeders that also require particular flow rates to achieve rated performance. If pumps are modified, system flows could be increased or decreased in flow or pressure.

There could be damage to filtration efficacy or filter elements if the pressure were too high. If the flow/pressure were too low, there could be insufficient flow to achieve required water turnover, sufficient chemical generation, and proper filtration. Most system components have maximum flow rates and maximum working pressures so elevating flow and or pressure can negatively impact products and overall water treatment system performance in many ways. Due to many variables in pool design and bather loading quantitative assessment of each pool is best. Operating the system at too low a speed could hurt filtration, oxidation, and disinfection performance and may require more frequent water chemistry testing.

Changes to pumps and pumping systems to slow or lower flow rates may reduce levels of pressure and vacuum within the circulation system. At lower levels of pressure and vacuum certain devices may not work as effectively. Supplemental safety devices such as safety vacuum release and limiting systems: air inlets, valves, pump shut off devices, VS-SVRS pumps, or other devices may not have been designed or tested for such conditions. Therefore careful consideration should be made when servicing products. Use of non-OEM parts invalidates NSF Certification product let alone cause other serious impacts upon system performance. ■