CHEMICALS, GENERATORS OR FEEDERS, AND CONTROLLERS

The Three-Pronged Approach To Better Chemical Safety

In setting up a chemical feed system, there are several important components to consider: the chemical, the chemical generator or feeder, and the chemical controller. These components all must be compatible and they all should be certified to work together safely and effectively. Chemical feeders are designed for certain types of chemicals (solid, liquid or slurry), and even specific chemical formulations (trichlor vs. cal hypo). This is not limited to just disinfectant tablet feeders, but is also applicable to mechanical feed pumps for other chemical dosing. The wrong chemical or concentration can lead to corrosion and failure of the mechanical pump feeder. Using the wrong chemical in a tablet feeder may result in underdosing or overdosing the chemical, and even lead to explosions.

THE CHEMICAL

The first thing to consider is the chemical that is being dosed and the target range. Disinfectants, algaecides and other biocides are required by federal law to be registered by the U.S. Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). They should have an EPA label stating that they are authorized for use in pools or spas at specific dose ranges.

Beyond EPA registration for disinfectants and algaecides, the U.S. Centers for Disease Control and Prevention's Model Aquatic Health Code (MAHC) requires chemicals to be certified to NSF/ANSI 50, NSF/ANSI 60, or to have a FIFRA registration. The certification requirement includes: salts used with electrolytic chlorinators, disinfectants, pH adjusters, clarifiers and many other chemical types. NSF/ANSI 50 is the definitive standard for recreational water health and safety. Chemicals certified to NSF/ANSI 50 are evaluated for their intended end use, pools and spas, not drinking water. The NSF/ANSI 50 requirements ensure that the ingredients in a treatment chemical will not cause adverse health effects.

It's also important to assess the expiration dates and periods prior to ordering chemicals. It does no good to order a two-year supply of treatment chemicals if they expire in six months. You should also be aware that not all brands of a specific chemical are the same. You may think sodium hypochlorite is always the same no matter where it comes from, but different brands vary in concentration as well as purity. Solid chlorine tablets such as calcium hypochlorite vary by brand as well. The leading brands vary in erosion rates by significant margins.

THE CHEMICAL FEEDER

When choosing a chemical feeder, pick one that is designed for the specific chemical you are using. Many manufacturers of chemicals also sell chemical feeders or recommend a specific chemical feeder for use with their product. Using one brand of tablet with another brand of feeder could result in under- or over-chlorination. Using the wrong type of chemical (such as trichloroisocyanurate in a calcium hypochlorite feeder) could result in an explosion.

Also make sure that the chemical feeder is certified to NSF/ANSI 50. This standard requires chemical feeders to be tested with the manufacturer's recommended chemical for durability regarding long-term corrosion resistance, pressure and performance, including chemical output tests. The correct chemical in mechanical pump feeders is also important for operation and safety. If a feeder is used with the incorrect chemical or concentration, it may cause damage to the equipment so the water cannot be properly treated. The MAHC requires all types of chemical feeders be certified to NSF/ANSI 50.

THE CONTROLLER

The third piece of the chemical dosing system is the automatic controller. Automatic controllers turn on and off the chemical generators and feeders of disinfectant or other chemicals based on the measured water quality parameter. The MAHC also requires that if a chemical feeder is used with an automatic controller, the controller must be certified to NSF/ANSI 50. The certification includes chemical resistance and life-cycle tests, as well as measurement accuracy.

The certification verifies that the controller won't have any performance degradation of the sensors during normal operation. NSF/ANSI 50 certification also requires operational protections for automatic controllers in case of unsafe conditions such as no-flow conditions. This is to prevent build-up of chemical in the circulation system, with a major concern being chlorine gas build-up during no-flow situations. If the acid feeder does not turn off during no-flow occurrences, once flow returns, a chlorine gas bubble will release into the pool. Operators should be diligent with any consideration to override the safety features of a controller. Finally, be sure to monitor the chemical concentration at start-up and several times during the day.

In summary, using compatible, certified chemicals, generators and controllers helps ensure that the entire chemical feed system works safely and efficiently.

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