



Join the WEF-olution: Why Pool Pros Should Embrace Pump Weighted Energy Factor

The pool pump market is about to undergo a seismic shift. Starting July 19, 2021, all pump manufacturers will be required to comply with efficiency standards from the U.S. Department of Energy (DOE) that apply to all new pumps.

The standards are largely based on requirements for Weighted Energy Factor (WEF), a new metric used to calculate overall pump efficiency. This standardized measurement will provide a more reliable way for manufacturers to communicate the energy consumption of their products, and all pumps will need to clearly display their WEF rating on their packaging.

As you'll see, the new rating system offers many advantages to consumers and pool professionals. But to take full advantage of WEF, it's important to understand a few basics. Let's take a look at what WEF is, why it matters and where the industry is headed as a result.

The Energy Factor

What, exactly, is WEF? To answer that, let's forget about the "W" in the acronym for a moment.

Efficiency Factor (EF) is the simple way for any residential appliance to answer a basic question: how good is it at translating its input (i.e. electricity) into output? That ratio of input to output is its Efficiency Factor. Broadly speaking, the higher the EF, the more efficient the appliance.

As an example, let's say your hair dryer needs the same amount of power as your refrigerator. That's very little output at a high energy cost, so your hair dryer would have a correspondingly low EF rating. Conversely, if your dishwasher could somehow run on the same power input as a 40-Watt bulb, it would have an incredibly high EF.

Simple, right? It does get a bit trickier for pumps, however. Think about it: how do you compare a single-speed pump's EF to that of a two-speed pump? If one product can, by design, deliver two different output levels, how do you make an apples-to-apples comparison? Do you take the number for the higher speed, or for the lower one?

Actually, you use both. And here is where we return to the "Weighted" part of Weighted Energy Factor. WEF measures a pump's efficiency at its different output points, multiplies them by a specific weighting factor (based on its real-world usage) and then adds the pieces together into one composite number. Two-speed pumps, for instance, use an 80/20 weighting ratio when combining their low-speed measurements with their high-speed ones.

Think of WEF like the Miles per Gallon (MPG) rating for a car, or like the Seasonal Energy Efficiency Ratio (SEER) for air conditioners. Both measure Energy Factor: MPG considers driving performance on both city streets and highways; SEER factors different energy needs based on seasonal weather patterns. Then, those individual calculations are weighted accordingly and added together into one easy-to-compare number.



Using the Scale

So now we've arrived at the most relevant question for pool pros and owners: what counts as a "good" WEF score? And unfortunately, like most things discussed here, there's no hard-and-fast answer. There's no official ceiling to the WEF score; the window between "good" and "bad" is entirely dependent on available efficiency technology. However, we can still make a few observations of what is good at this point in time.



Right now, most pumps across the industry fall somewhere in the 4–8 range. A particularly inefficient single-speed pump might hit as low as a 2. The industry’s current high-water mark belongs to Hayward, with a VS pump clocking in at a whopping 12.9.

*Side note: if you asked yourself “12.9 of WHAT?” while reading that number, here’s the answer. WEF is technically a measurement of Gallons per Watt Hour (gal/Wh), which indicates the volume of water moving through the pump per hour of energy unit applied. More simply, it’s the amount of output per input (sound familiar?). You’ll rarely see the unit attached to the score, but it’s worth a mention nonetheless.

In general, variable-speed pumps have a higher WEF rating than their single-speed counterparts. To revisit the car analogy, it’s the difference between a vehicle with multiple engine gears and a vehicle with only one. Unless there are other factors involved to dramatically impact overall performance (vehicle size, towing capacity, etc.), the multi-gear car can always adapt better to situational energy needs.

The same is true for pumps. Unless there’s a big difference in engine horsepower or product footprint, you’re almost always going to see higher WEF from variable-speed pumps.

“But wait,” many people wonder. “Does WEF mean that horsepower isn’t important anymore?”



Hold Your Horses

The short answer is “it’s still important.” The long answer is...well, let’s talk about horsepower.

Rated Horsepower (HP) is the power output of a motor at its pre-designed levels of voltage, frequency and revolutions per minute. It gets somewhat complicated, but mathematically astute readers might notice a subtle connection between HP and EF. And unfortunately, as with EF, the industry-wide conventions for measuring HP needed some standardization before the scores could be properly compared.

For years, pumps and motors have measured their output strength in terms of both HP and a somewhat nebulous “service factor.” If you’re confused, that’s okay—the industry was, too. It

was a flawed system, and it led to inconsistencies across the entire category that spawned multiple methodologies for calculating a valid horsepower rating (e.g. full rate, max rate, etc.).

To eliminate the confusion, the new DOE regulations also require the prominent display of every pump's Total Horsepower (THP). THP uses the same calculation for base horsepower, with one important change: the service factor has been standardized across all pumps. In the same way that WEF allowed us to compare EF more equally, THP does the same for HP.

One other term you might see in the market is Hydraulic Horsepower (HHP), which is a pump's HP at the point where water leaves the pump (directly proportional to its head and flow rate). And while HHP can provide some insight into specific cases, the DOE does not require packages to be labeled with HHP. It's not quite as useful of a comparison point, and a lot of the measured variables in the HHP calculation get absorbed into the broader WEF formula.

So finally, we can return to the long-awaited answer to the horsepower question. Yes, it's absolutely still important—just in a slightly different way than it might have been in the past.



No Compromises

Before we wrap this up, let's get one final WEF misconception out of the way: "energy-efficient" is not synonymous with "power-limited." Just because something uses its energy budget effectively doesn't mean that it necessarily generates an inferior output. That may have

been true in the past (while efficiency was still in its infancy), but today's products deliver efficiency to complement performance—not sacrifice it. Whether we're talking about vehicles, air conditioners or pool pumps, energy effectiveness is no longer locked into a zero-sum battle with strength.

What does all this mean for you? That's the easiest part. Selling DOE-compliant pumps is a win-win for both pool pros and pool owners. Sellers benefit from a higher product value, and buyers benefit from increased energy savings (not to mention other benefits like longer product lifespan, reduced operation noise and more).

If your head is still spinning from all this talk of EF and HP, that's okay. Education will take some time. But that's exactly why it's so important: being proactive gives you an invaluable advantage over the competition. Instead of bemoaning a new standard or additional regulation, you can seize the opportunity to get ahead of the curve and become a WEF expert. These regulations are coming, one way or another. Wouldn't you rather be prepared for it?

Key Takeaways

New DOE regulations (effective July 19, 2021) will use Weighted Energy Factor as the basis for measuring the efficiency of all new pumps created worldwide. While WEF may be a new term for the industry, it's really nothing new—just a more accurate way to compare one pump's input/output efficiency to another. And though it may take some time to get up to speed with the new regulatory lingo, this change actually offers an invaluable opportunity for both dealers and consumers to get more out of their pool pumps in the future.