

# Testing methods produce wide variations in pump efficiency ratings

The efficiency rating is an important but sometimes misleading number that can skew the pump selection process. In order to accurately assess the efficiency of a heavy-duty multistage pump, one must look at the testing process itself, which is documented as part of the published curves for each pump. Failure to do so can result in selecting a pump with higher energy requirements and greater lifetime energy costs, wasting resources and money.

In evaluating pump efficiency, there are two predominant guidelines in Europe, the Minimum Efficiency Index (MEI) and ISO standards (International Organization for Standardization). Each serves a different purpose in evaluating pump efficiency. Further, each requires more than a cursory review of the efficiency value in making accurate pump selections.

## MEI

The Minimum Efficiency Index (MEI) specifies the parameters for a pump to be marketed in Europe. It is a numerical value that indicates how a pump's efficiency at certain conditions compares with other pumps on the market.

The standard for water pump efficiency is  $\geq 0,40$ , meaning that 40 percent of the pumps on the market are below that efficiency level. An MEI of  $\geq 0,70$  is the benchmark for efficiency and reflects the best available technology on the market. Yet, a pump with  $MEI \geq 0,6$  can have a higher efficiency value than a pump with  $MEI \geq 0,7$  when the impeller is trimmed for the specific duty point. This underscores the importance of



e-MPA Model

reviewing the efficiency value for the specific duty point to find the most efficient pump.

## ISO and ANSI/HI acceptance

The MEI is only the first threshold to cross in evaluating efficiency. Testing and certification by the International Organization for Standardization as well as ANSI/HI 14.6, Rotodynamic Pumps for Hydraulic Performance Acceptance Tests, are intended to ascertain the performance of the pump and to compare this with the manufacturer's guarantee.

ISO 9906 specifies hydraulic performance acceptance tests for centrifugal pumps. A 2012 update specifies three levels of acceptance. The ANSI/HI 14.6 standard contains three grades of accuracy and tolerance bands for pump acceptance criteria, comparable to ISO 9906.

- Grades 1B, 1E and 1U with tight tolerances
- Grades 2B and 2U with broader tolerances
- Grade 3B with even broader tolerances

In industrial applications that call for multistage, multiport pumps, ISO 9906:2012 recommends grade 2B for testing, with a -5% efficiency tolerance.

The same pump, tested at the same flow, head, power and speed at grade 3B with a -7% tolerance will yield a higher efficiency rating. By using a lower test grade, efficiency skews higher due to the broader tolerance.

The ISO and ANSI/HI standards are acceptable at either test grade, but test grades cannot be compared similarly in assessing efficiency of competing products. *It is critical to look beyond the percentages to determine the actual efficiency of a multistage pump.*

### Review the facts

In order to make educated decisions in pump specification and like comparisons among manufacturers, include the following steps in your process:

- Consult the pump's technical catalog to determine which test grade is being used and if degrading factors for other test grades are provided.
- When using an online selection tool, determine if the program automatically adjusts curves according to the selected test grade and material selection.
- When reviewing pumps from different manufacturers, be sure to adjust to the same test grade levels for like comparisons.

When specifying large multistage pumps, every percentage point in efficiency has a tremendous impact on energy costs. When pump efficiency is compared on a level playing field, it becomes just one part of the equation. In addition, price, product quality, reliability and technical support and education are other important factors to consider in the pump selection process.



e-MPR Model



e-MPD Model



e-MPV Model



Legal head office  
Xylem Water Solutions Italia Srl

Via Gioacchino Rossini 1/A  
20020 - Lainate (MI) - Italy  
Tel. (+39) 02 90358.1  
Fax (+39) 02 9019990  
[www.xylemwatersolutions.com](http://www.xylemwatersolutions.com)

For information and technical support  
Xylem Service Italia Srl

Via Dottor Vittorio Lombardi 14  
36075 - Montecchio Maggiore (VI) - Italy  
Tel. (+39) 0444 707111  
Fax (+39) 0444 491043  
[www.lowara.com](http://www.lowara.com)

Lowara is a trademark of Xylem Inc. or one of its subsidiaries.  
All other trademarks or registered trademarks are property of their respective owners.

Xylem Water Solutions Italia Srl reserves the right to make modification without prior notice.  
Lowara, Xylem are trademarks of Xylem Inc. or one of its subsidiaries. © 2016 Xylem, Inc.