

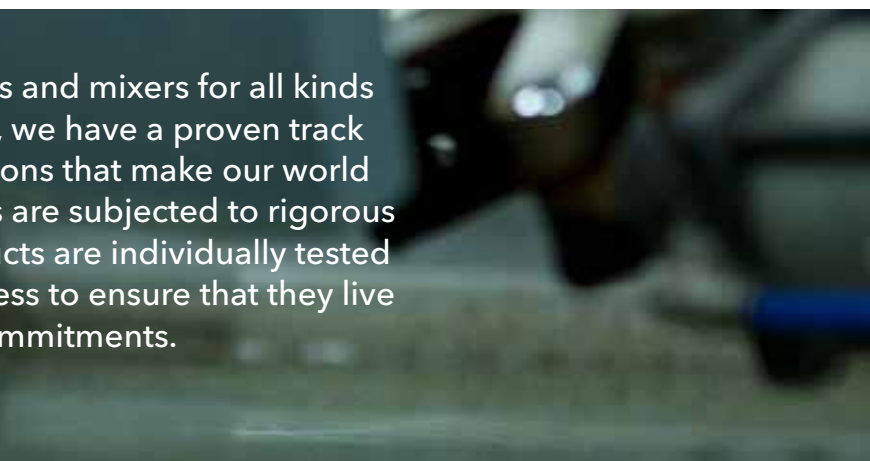


# Living up to our quality and performance commitments

ADVANCED PRODUCT TESTING AT OUR EMMABODA FACILITY

# Living up to our performance commitments

As the leading manufacturer of pumps and mixers for all kinds of water and wastewater applications, we have a proven track record of providing engineered solutions that make our world a better place. Our pumps and mixers are subjected to rigorous tests before leaving the factory. Products are individually tested during the entire manufacturing process to ensure that they live up to our quality and performance commitments.



## Testing for success

Our state-of-the-art test facilities play a critical role in ensuring that our pumps and mixers consistently deliver unmatched performance. Whether small, medium or large products, we ensure the quality of Flygt products through comprehensive testing throughout the manufacturing process.

## Quality assurance standards

In addition to our own demanding quality assurance standards, we adhere to international standards developed by organizations such as the International Organization for Standardization (ISO), Hydraulic Institute (HI) and Deutsches Institut für Normung (DIN). We also lead work and participate in work to create and revise international standards. We have helped create the ISO 9906, HI 9.6, HI 11.6 and HI 14.6 standards. Our efforts in establishing thrust as the key parameter to measure mixer performance led to the ISO 21630 mixer performance standard.



Our ISO 9001-certified quality assurance system is audited on an annual basis to ensure that Flygt products meet international standards as well as customer specifications for efficiency, reliability and performance.

**Built to stand the test of time**

Prior to manufacturing, we conduct material analysis, strength testing and dimensional checks on parts to ensure compliance with our drawings and specifications. During the manufacturing process, we apply our operational know-how and years of experience to ensure the highest level of quality for all Flygt products.

In addition, we perform random checks on parts for standard products and thoroughly inspect all components of EX- and FM-approved products.

# Factory testing



These factory tests are typically performed on every product we manufacture. Additional customer-specific tests are performed based on specific requirements and the type of product manufactured.

	Pumps	Mixers	Monitoring sensors
Tightness test	•	•	
Withstand voltage test	•	•	
Earth continuity test	•	•	
Performance test	•		
No load test*		•	
Functional test			•

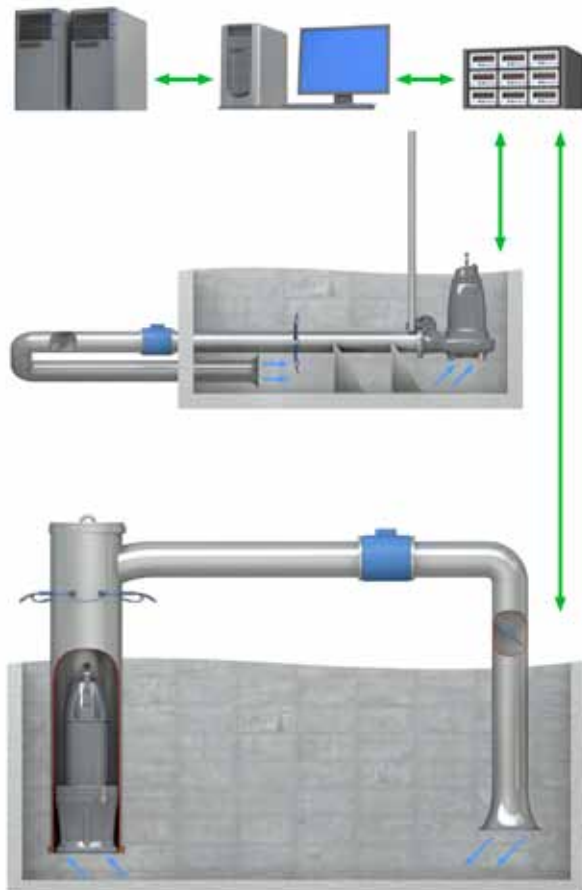
\* To obtain relevant and repeatable values, the test facility's tank must be shaped in such a way that the return flow of water does not affect the mixer. Hydrodynamic analyses and model verification tests have achieved conditions that are similar to those in an infinite liquid volume.

## Tightness test

The tightness test verifies that a submersible product is watertight and that the shaft seal is properly installed and functioning. In this test, we use a vacuum source to ensure tightness. We either compare the differential pressure between the tested product and a reference volume, or measure the airflow required to maintain the test vacuum level in order to verify that the seal system is tight.

## Withstand voltage test

A voltage equivalent to two times the rated voltage + 1000 V is applied to the motor windings and the casing to detect faults in the insulation system. The test complies with the IEC 60034-1 standard for rotating machinery. Pump sensors are tested in a similar manner with 1500 V.



### Earth continuity test

This test verifies the integrity of the ground connections. During the test, a current of 10 A is applied for one minute while the resistance of the circuit is measured. This ensures that the grounding system is intact and has sufficiently low resistance. The test complies with the EN 50106 standard.

### Performance tests

#### *Pumps*

A pump performance test verifies that the pump delivers the specified flow and head while meeting any efficiency guarantee given. Pumps are tested to ensure compliance with ISO 9906 or HI 11.6. Our state-of-the-art factory test facilities are highly automated and rigidly calibrated to ensure precise and efficient testing.



In addition to using the most advanced testing software, we measure, evaluate and record head, flow, motor current and power consumption at the rated voltage and frequency. A detailed test rapport is provided for all certified or witnessed tests.

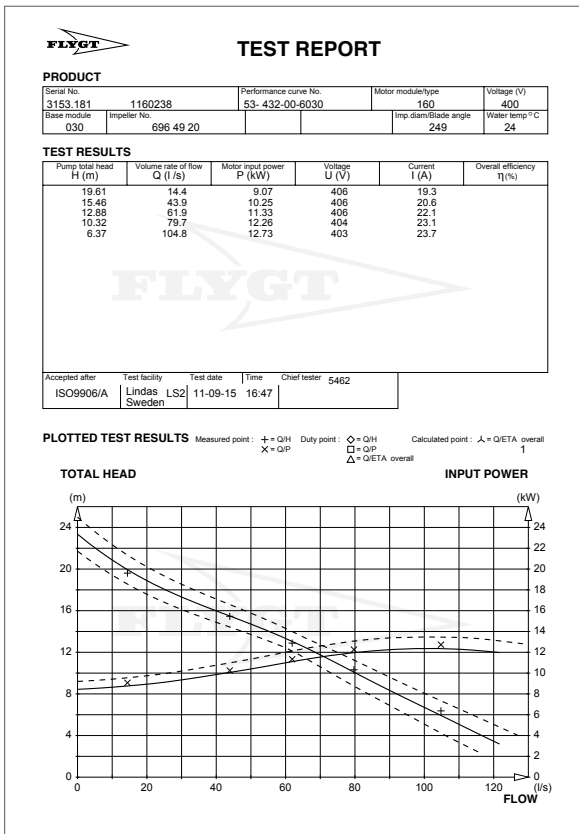
#### *Mixers*

All mixers are no load tested at the factory. Motor and input power are measured at the rated voltage and frequency. Upon request, we perform a thrust measurement test for quality assurance on Flygt mixers in accordance with ISO 21630.

#### *Pump and mixer sensors*

During performance testing, all pump and mixer sensors are connected to a standard monitoring system to verify proper signal and response.

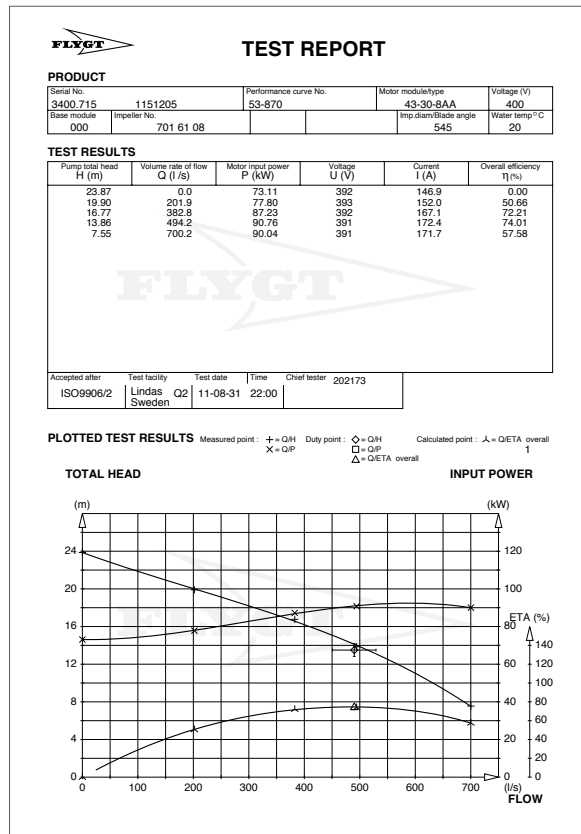
# Performance test results



Test report with five measured points plotted together with a standard performance curve.

## Documentation

We record and save every test point and produce a detailed test report. Our test reports meet the requirements of ISO, HI and DIN test standards. We store the results in a traceable database for a minimum of 20 years. Test reports typically contain a measured curve based on measured points together with a duty point and its ISO or HI tolerances or a standard performance curve.



Test report with a measured curve based on five measured points together with a duty point with its ISO tolerances.

## Calibration

All measurement and test equipment is calibrated according to a schedule, and the accuracies are traceable to international measuring standards.

The equipment for testing performance corresponds to all major international pump and mixer test standards, including ISO 2548, ISO 3555, ISO 9906, HI 11.6, DIN 1944 Classes II and III and ISO 21630.

# Worldwide testing capabilities

Flygt pumps and mixers deliver proven results on a daily basis at thousands of installations worldwide. A multitude of test facilities around the world stand behind the success of Flygt products, validating their performance prior to delivery.

Stringent quality assurance and quality control processes are employed to ensure each product meets our rigorous standards. This proven process ensures that customers receive the quality and performance that they expect from Flygt.



## Major facilities

### PEWAUKEE, WISCONSIN, USA

The Flygt test facility in Pewaukee houses the largest indoor pump test facility in North America. It enables testing of our full range of pumps of all types and sizes.

### EMMABODA, SWEDEN

The Flygt test facility in Emmaboda is one of the most advanced in the world. It has 18 test stations for Flygt product testing. Our pump and mixer test plants are an integral part of the 100,000-square-meter manufacturing facility. Each and every Flygt pump and mixer is tested before leaving the manufacturing plant.

### SHENYANG, CHINA

There are five Flygt test facilities in China, which were built with Swedish expertise and support to ensure the use of the same high standards of design, software and testing. In Shenyang, three are dedicated solely to testing the Flygt 3000 series pump and one to mixer testing. Our Nanjing facility tests the Flygt GG pump.

## Facts and figures

EMMABODA	
Number of test plants	18
Types of products tested	All submersible Flygt products
Types of tests conducted	Tightness tests, withstand voltage test, pump performance tests and mixer thrust tests. No load tests for mixers
Test specialties	Witness testing of pumps and mixers and mixer thrust
Test plant size	1×1m for small pumps to 10×20m for large pumps and mixers
Annual production capacity	150,000 units
Pump test measurements	Flow rate: 1–8,000 l/s Head: 0–400 m Motors: 0.2–800 kW
Annual tests per year	150,000
Production standards	ISO 9001, ISO 14001 and GOST
Number of specialists	More than 50 specialists for standard assembly line testing of whom 10 are dedicated testing professionals

	PEWAUKEE	SHENYANG	NANJING	INDIA
Size and volume of basin	1,700 m <sup>3</sup>	240 m <sup>3</sup>	2,000 m <sup>3</sup>	3,000 m <sup>3</sup>
Max. test flow	19 m <sup>3</sup> /s	2.5 m <sup>3</sup> /s	7 m <sup>3</sup> /s	22 m <sup>3</sup> /s
Max. test head	70 m (100 psi)	150 m (213 psi)	100 m (142 psi)	70 m (100 psi)
Max. test power	4,500 kW (6000 HP)	100 kW (55 HP)	600 kW (760 HP)	7500 kW (9856 HP)
Max. test discharge size	2,750 mm	800 mm	1,400mm	2,750 mm
Lifting capacity	55 ton	2.5 ton	10 ton	90 ton

# Xylem ['zīləm]

- 1) The tissue in plants that brings water upward from the roots
- 2) A leading global water technology company

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to [xylem.com](http://xylem.com).



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