Measurement & Analytics | Measurement made easy

MB3600-CH70
FT-NIR polyol analyzer
Pre-calibrated for OH value determination

Power and productivity
for a better world™

Adapted for polyols and polyurethanes applications

The MB3600-CH70 Polyol Analyzer is a rugged and high performance industrial FT-NIR spectrometer for R&D and QA/QC applications on polyols and derivatives. This spectrometer is intended for chemical industry laboratories that perform a large number of daily measurements for QA/QC analysis or at-line process support. It is particularly adapted for applications in the fields of polyols and polyurethanes.

The MB3600-CH70 is a maintenance-free bench analyzer enabling fast determination of several quality properties in liquid organic chemicals. It represents over 20 years of expertise in polyol analysis, in particular for determining hydroxyl value (OH), which gives the amount of hydroxyl groups available for reaction. This measurement provides critical information on distribution and range of chain lengths. It is an important indicator of quality for companies handling polyols, either for certification of incoming materials, final products or at-line process monitoring.

Pre-calibrated for OH value determination

Features

The MB3600-CH70 features a set of pre-loaded calibration models with operator interface for immediate OH value determination in polyols and derivatives. This approach is easier, cleaner and significantly faster than the primary titration methods that require toxic solvents; it makes the MB3600-CH70 a true turnkey solution operational from the day of installation.

In addition, users can access an extensive library of FT-NIR spectra (over 3,800). Custom calibrations can be developed on the MB3600-CH70 for rapid measurement of more quality parameters such as iodine value, acid value, saponification number, amine content, isocyanate content and TDI isomer ratio.

Benefits

- Fast and accurate analysis as an alternative to wet laboratory techniques.
- No requirement for reagents or solvents
- Inclusion of turnkey calibrations for OH value analysis
- Capable of additional multi-property analysis
- Rugged and simple software interface
- State-of-the-art analytical performance
- Low cost of ownership (10 years maintenance-free)
- Minimal footprint
- Access to ABB library of polyol FT-NIR spectra
- Editable global OH value calibration
- Transferability of calibrations to other ABB laboratory and process analyzers
- Turnkey solution
- Operator-ready. Minimal training required.

A set of turnkey calibration models

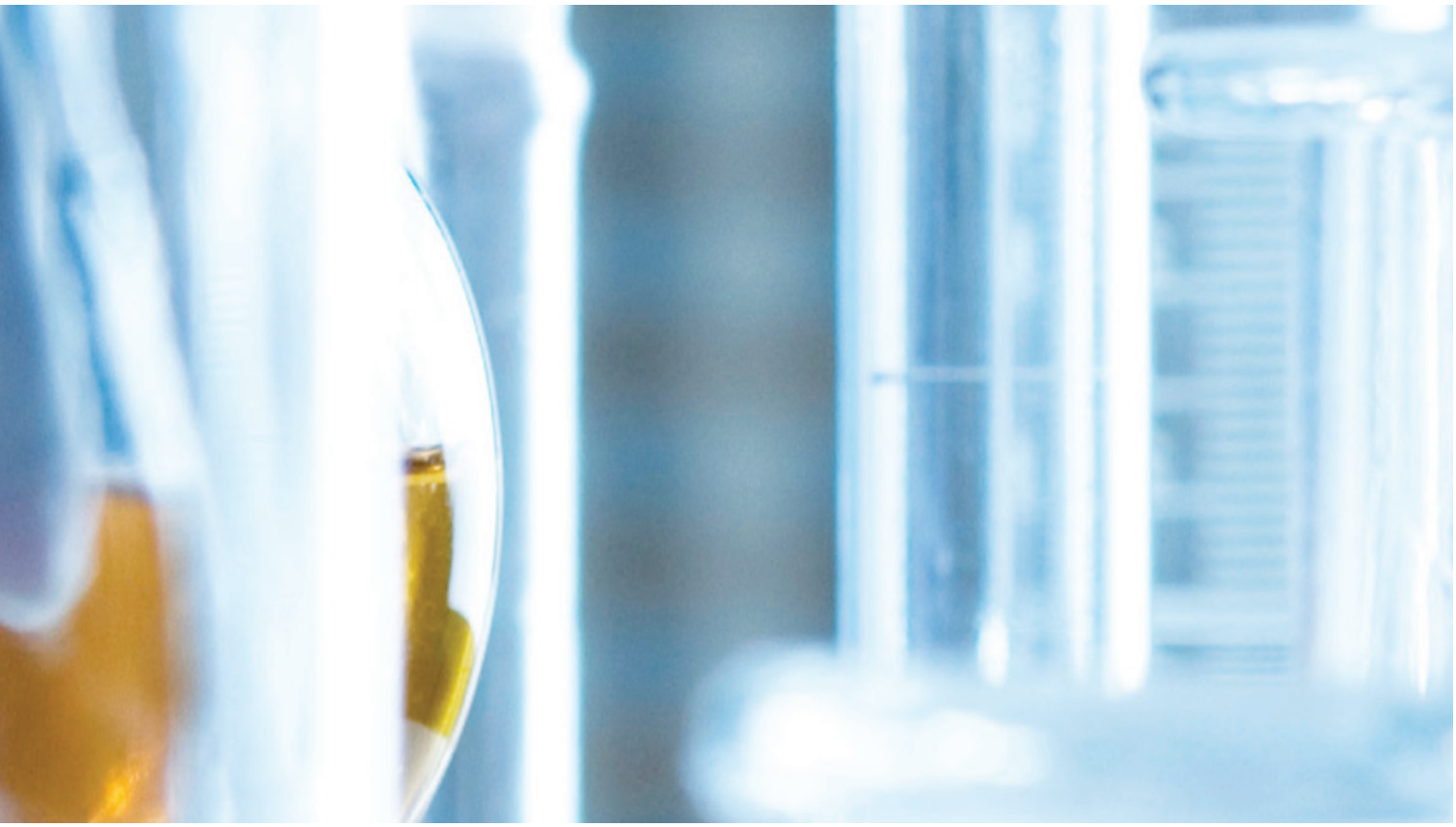
Turnkey OH value analysis

One of the common challenge associated with NIR method development consists of building a chemometrics calibration model tailored to each application. The task requires a number of samples spanning the property range, as well as some laboratory reference values for all those samples. This step can be complex and time-consuming in some cases. With more than 20 years of experience in of polyol analysis, ABB has developed an unrivalled expertise in this field and can offer a set of turnkey calibration models for different groups of polyols and derivatives. Those calibrations are pre-loaded on the instrument and configured as starter methods in the Horizon*MB* QA user-friendly operator interface. From the day of installation, the user can analyze his products for OH value with one of the nine group-specific models, or with a generic OH-value model that combines several families of polyols.

Group	SECV (1 σ)*	Range min*	Range max*	r^2
Acrylic	4.6	8.7	146.0	0.990
Alcohol alkoxylate	2.1	31.1	108.8	0.994
Ethoxylated alcohol	3.2	17.9	175.6	0.992
Ethoxylate	1.9	12.5	197.5	0.999
Ethylene/Propylene oxide	0.9	8.7	72.0	0.997
Fatty acid	1.7	24.6	289.6	1.000
Polyester	3.1	26.9	328.9	0.998
Polyether	1.2	21.6	231.2	0.999
Poly-X glycol	5.1	12.6	369.6	0.998

*unit: mg KOH/g

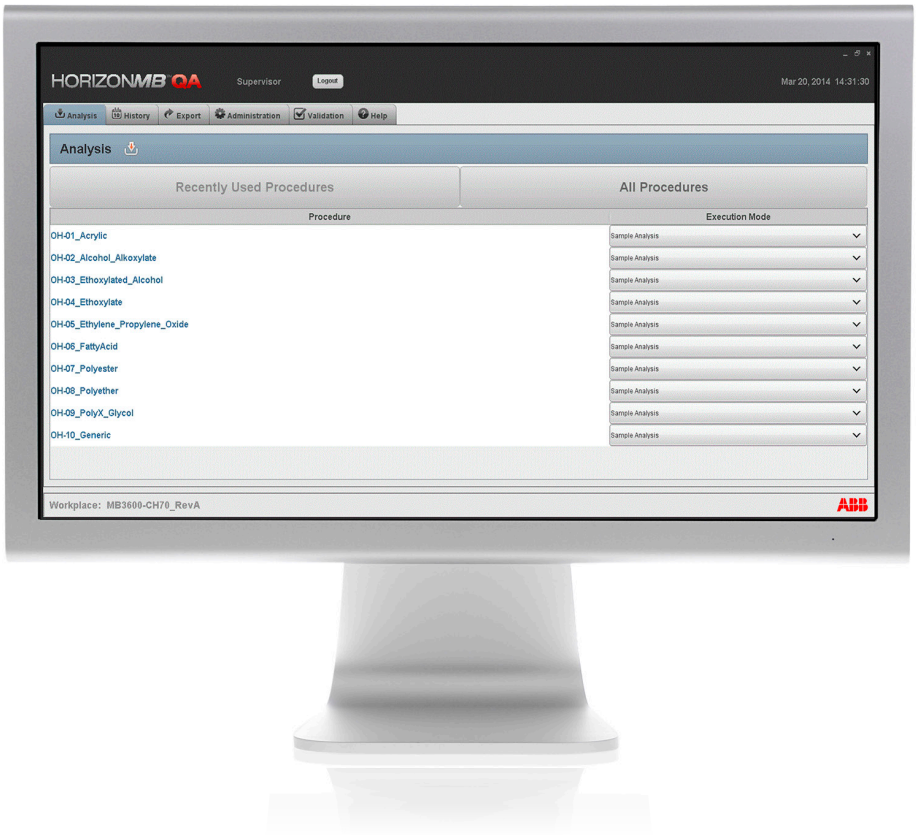
A set of turnkey calibration models



In addition to hydoxyl value, many other key properties of polyols or liquid organic chemicals can be analyzed with the MB3600-CH70. If specific calibration models are developed for different properties, it is possible to measure them all simultaneously in a single sample. The technique is fast, clean and reliable, using the disposable vial holder sampling of the MB3600-CH70. The table below gives examples of typical performance achieved with ABB FT-NIR technology for different measurements.

Property / Sample	Units	SEP (1 σ)	Repeatability (r)	Range min	Range max
Iodine value (high)	g	0.82	0.15	120	190
Iodine value (low)	g	0.18	0.08	0	5
Acid value	mg KOH/g	0.53	0.11	187	270
Saponification number	Units	1.30	0.63	0	50
Ethoxylated amine	mg/g	1.30	0.32	286	360
Primary amine	meq/g	0.04	0.003	4.7	5.2
Primary amine	meq/g	0.06	0.002	0.1	1
Secondary amine	meq/g	0.006	0.001	0	0.7
Secondary amine	meq/g	0.03	0.006	0.4	2.8
Isocyanate content	%	0.07	0.01	1.4	2

Maintenance-free analyzer



User-friendly operator interface for routine analysis

The Horizon*MB* QA operator interface module makes running QA/QC and routine applications simple and reliable for laboratory staff by providing intuitive workflow along with integrated spectrometer and accessory control. The software guides the user in every step from analyzing routine samples to designing QA/QC applications and implementing turnkey methods. Horizon*MB* QA also enables plant connectivity by automatically generating a tab-separated file with detailed results and parameter information for each sample analysis performed with a procedure. This file can then be imported by a LIMS system.

An exceptionally low cost of ownership

While the MB3600-CH70 vertical design provides a minimal footprint, it is also an analyzer with minimal cost of ownership. Our engineers have designed the modular components of the MB3600-CH70 to provide the longest product life on the market according to the following key principles:

- No maintenance
- No adjustments
- No wear of the scan mechanism

As a result, the pre-aligned source module with electronic stabilization is designed to operate for 10 years without replacement, and the solid state laser-based metrology module has a 20 year lifespan. All MB3600-CH70 optics are non-hygroscopic so that no instrument purging is necessary for optical protection.

Robust field-proven analyzer

Quick and simple analysis for fast product release

The MB3600-CH70 Polyol Analyzer simplifies hydroxyl value and similar analyses such as acid number, moisture or EO/PO ratio. The analysis is performed using disposable vials, which eliminates issues associated with cross-contamination or cell cleaning. The measurement is made within a few seconds and does not require analytical expertise. As a result, the MB3600-CH70 significantly reduces the cost of laboratory analyses while improving product consistency and laboratory throughput.

Seamless laboratory-to-process calibration transfer

ABB has developed manufacturing methods that ensure all our laboratory and process FT-NIR analyzers are highly stable, have a highly linear photometric response, and provide identical absorbance spectra. This enables calibration transferability from laboratory to process without any additional effort.

A flexible platform for QA/QC and R&D

The MB3600-CH70 FT-NIR Analyzer is more than just a robust field-proven analyzer for OH value that replaces costly and time-consuming wet-chemical titration analyses. It is also a powerful method-development platform for applications designed to replace other slow functional-group analytical procedures, in both liquids and solid powder products. The sampling interface is modular and the disposable liquid vial holder can easily be replaced with accessories for analysis or gels, creams, pastes, powders and even fiber optics insertion probes.

ABB Inc.
Process Automation
Measurement & Analytics
3400, Rue Pierre-Ardouin
Quebec (Quebec) G1P 0B2
Canada
Tel.: +1 418 877-2944
1 800 858-3847 (North America)
Fax: +1 418 877-2834
E-Mail: ftir@ca.abb.com

www.abb.com/analytical

Note

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.
We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents in whole or in parts – is forbidden without prior written consent of ABB.

Sales

Service

PB/MB3600/CH70-EN Rev. A 01.2016

Power and productivity
for a better world™