



ABB MEASUREMENT & ANALYTICS

# MB3600-CH40

FT-NIR solids analyzer



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## Measurement made easy

**The MB3600-CH40 is designed to perform fast and accurate determination of key physico-chemical attributes of raw materials, in-process or finished products in solid form such as powders, pellets, grains and agrochemicals.**

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# Fast and accurate FT-NIR analysis of solids material

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01 Fertilizers

The MB3600-CH40 provides fine and specialty chemical companies a fast and non-destructive alternative to compendial QA/QC analytical methods that are usually slow, expensive and complex.

Those companies must be able to check rapidly and regularly chemical specifications of the different product grades to minimize reworks, downgrading and quality giveaways.

The MB3600-CH40 is particularly adapted to

agrochemical suppliers who need to facilitate the safe and efficient use of their crop protection formulations while ensuring protection of workers, end-users and environment.

It is also an ideal tool for fertilizer producers who need to characterize their raw materials and develop predictive indicators for transformation dynamics and fertilization value of organic matter.

The analyser can also be fitted with optional accessories to analyse liquids or gel samples. .



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# Fast, simple to use and maintenance-free analytical tool

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02 MB3600-CH40  
and its accessories:  
universal vial holder,  
hand-held pen probe,  
and powder samplir

Traditional QA/QC analytical methods typically require some fractionation, titration, drying, weighing or separation steps to be executed by qualified analytical personnel for assay determination. In contrast, the MB3600-CH40 is a fast, simple to use and maintenance-free analytical tool. Its measurement principle is based on near-infrared spectroscopy, a well-established analytical technique for quantitative determination of chemical and physical properties of solid and liquid chemical samples.

The large number of properties that can be determined from a single MB3600-CH40 measurement combined with the speed and simplicity of analysis make it a very attractive alternative for companies confronted with an increasing demand for multiple time-consuming and reagent-intensive analyses. The results are statistically comparable to those found by traditional laboratory techniques. In addition, the instrument can be used by operators without analytical expertise, and its implementation allows reducing organic solvent consumption and waste generation while increasing sample measurement frequency.

## **A user-friendly analytical solution**

To perform a sample assay with the MB3600-CH40, an operator must simply fill the disposable 20ml vial with product, place the vial into the measurement location and click 'OK' to start the measurement scan. Less than a minute later, the result for one or several chemical or physical properties are simultaneously displayed and saved, and the instrument is ready for the next sample. Throughout the whole analysis process, some simple on-screen messages and instructions are displayed via the Horizon QA software to allow even an untrained operator to get accurate results.



# Multiple chemical properties determined in few seconds

03 HorizonMB QA software interface

## Rapid development of custom analytical methods

Using the MB3600-CH40, multiple physico-chemical properties can be determined simultaneously on a single sample. This makes the analyzer an excellent operation platform for a host of spectroscopy-based methods, replacing tedious and expensive wet chemical procedures.

It is ready to use for the quick development of custom methods on a wide variety of sample types, including granules, powders, pellets or even liquids. The instrument can be used in QA/QC laboratory for qualification of incoming raw materials or final product certification. With a measurement time of a few seconds, it can also be used at-line as a rapid support tool for process monitoring and verification.



# A flexible and complete line of accessories

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04 Laser level transmitter used in bulk solids silo, tank with an agitator and liquid tank



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## Wide variety of easily interchangeable accessories

The MB3600-CH40 comes by default with a rotating diffuse reflectance accessory with large sample area for analysis of solids, pellets or powders in scintillation vials.

In addition, it is a scalable analyzer that can be fitted with a variety of easily interchangeable accessories that do not require alignment to accommodate all kinds of samples. Among others, the following sampling options are available:

- Universal heatable vial holder (analysis of liquids and waxes in disposable vials with 5 mm, 8 mm and 12 mm OD [0.20, 0.31, 0.47 in. OD])
- Hand-held 'pen' probe (powders)
- Fiber-optic launcher to interface with flow-through cells (liquids), transmission probes (liquids), transreflectance probes (opaque liquids) or diffuse reflectance probes (powders)
- Fiber-optic coupled disposable temperature controlled vial (liquids)
- Temperature controlled transmission cell (liquids)

# Reliable industrial solution

05 Agrochemicals plant

## Straightforward implementation

The MB3600-CH40 is equipped with the modern and intuitive Horizon software suite. It includes a user-friendly operator interface Horizon QA for routine sample analysis and reporting.

Quantitative methods for multiple products and properties can be developed and customized with the Horizon Quantify chemometrics package. ABB can also supply calibration services to develop custom calibration methods, based on samples and reference assay values supplied by customer.

## Reliable industrial solutions

ABB has been a world leader for many years in industrial analytical solutions. Our laboratory analyzers are renowned for their ruggedness and long-term stability. Our engineers have designed the Solids analyzer with dependable components in order to provide uninterrupted analysis capability without requiring adjustments by analytical expert.

The different accessories are easily interchangeable without requiring optics re-alignment. The aluminum casting of the MB3600-CH40 provides the level of protection required for intensive use in an industrial environment. It also features permanently aligned optics and a light source that has an average lifespan of 10 years, which means that the instrument is virtually maintenance-free. For additional serenity, users can rely on the built-in health monitoring checks that run continuously while the instrument is in operation.

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# Technical specifications

## Spectroscopic performance (typical at 25°C [77 F°])

- Spectral Range 3,700 to 15,000  $\text{cm}^{-1}$
- Resolution better than 0.7  $\text{cm}^{-1}$
- Apodized Resolution Adjustable 1  $\text{cm}^{-1}$  to 64  $\text{cm}^{-1}$  (2<sup>r</sup> increments)
- Short-term stability (@ 8000  $\text{cm}^{-1}$ ): <0.09 %
- Frequency repeatability (@ 7300  $\text{cm}^{-1}$ ): <0.006  $\text{cm}^{-1}$
- Frequency accuracy (@ 7300  $\text{cm}^{-1}$ ): <0.06  $\text{cm}^{-1}$
- Absorbance reproducibility (measured on spectroscopic grade toluene): <0.002 AU

## Application software (computer not included)

- Horizon MB FTIR: basic instrument operations and validation
- Horizon MB Quantify: chemometrics, calibration development, instrument qualification
- Horizon QA: Intuitive operator interface for routine analysis and QA/QC operations

## Optical bench

- Beamsplitter material: ZnSe (non-hygroscopic)
- Patented double pivot high throughput Michelson interferometer, fully jacketed
- Optical path fully purgeable
- Source: quartz halogen with electronic stabilization
- Metrology: solid-state laser
- Detector module with integrated cooling: extended-InGaAs
- Open sample compartment configuration: Arid-zone, center focus
- Sample compartment dimensions: 20 x 14 cm (7.8 x 5.5 in.) plate, 8.7 cm (3.1 in.) beam height

## Sampling accessories

- Default: rotating Powder sampler (diffuse reflectance – solids)
- Option: universal heatable vial holder (transmission – liquids)
- Option: hand-held 'pen' probe (diffuse reflectance - powders)
- Option: fiber-optic launcher to interface with flow-through cells (liquids), transmission probes (liquids), transfectance probes (opaque liquids) or diffuse reflectance probes (powders)
- Option: temperature-controlled cell (transmission – liquids)

## Data communication

- Hardware port: ethernet, 10/100 Mbps

## Instrument enclosure

- Casting: rugged all-metal with integral handles
- Dimensions (H x W x D): 37 x 43.5 x 28 cm (14.5 x 16.9 x 11 in.)
- Weight: 24 kg (52.9 lbs.)

## Environmental

- Universal power supply: 120 to 240 VAC, 50/60 Hz
- Power consumption: 65 W
- Operating temperature: 10°C to 35°C (50°F to 95°F)
- Operating relative humidity: 5 % to 80 %, non-condensing
- Regulatory certification and compliance: TUV and CE

## Documentation

- User manual
- Quick-start guide



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