



## Iso-Chem™ Systems

### NIR Monitors for Chemical Applications

#### Save time, assure consistency

Iso-Chem systems are portable Near Infrared (NIR) analyzers with remotely triggered testing probes. They are designed to provide confirmatory chemical analysis in seconds, in-line. Iso-Chem, LT Industries' NIR chemical analysis system, is stronger, more reliable, and built to provide the best price/performance value in the NIR field. Iso-Chem also meets the critical business tests of the increasingly vigorous chemical formulation world. It's small, fast, and inexpensive, and because raw material calibration libraries are often transferred from plant to plant, Iso-Chem also includes a parented system to assure seamless transfers.

#### Easy to use, easy to own

The Iso-Chem monitor line is a family of modular instruments for the best possible match to user needs. Acquire what you need, expand later, add capabilities and still preserve your budget. Iso-Chem systems require the lowest capital investment in the competitive chemical industry: even the most extensive system configuration is priced well below other "bare-bones" NIR systems. Each system includes LT Industries' LTVista software - truly point and click operation right at the test sample.



The Iso-Chem system with a fiber optic bundle and a transreflectance probe.

#### The basic system

An Iso-Chem material monitor includes a rugged NIR spectrometer, a 2-meter fiber optic cable, a remote testing probe, LTVista software, remote modem diagnostic package and manuals. Add a computer and this system is ready for work.

#### Iso-Chem/SPX™

LT Industries' SPX technology adds parallel data processing to the Iso-Chem system. This sophisticated electronic package allows system expansion over long distances and expands system capability for use with VISTA Software for NIR



Analysis™ -- a Microsoft Windows®-based program compatible with GRAMS/32 AI and PLSPlus IQ software packages.

### Utility Options

- **Iso-Chem 5M Probe**

Extend your testing reach. The extended-length probe is ideal for applications where raw materials, in drums or bags, are palletized.

- **Freedom Probe™**

Despite the speed and passive interaction of NIR, testing probes must be cleaned between tests. Freedom Probe allows surface observation of all powdery materials and many solids without physical contact. The result? No intersample cleaning and no cleaning validation protocol.

- **TransKit™**

When Iso-Chem systems are needed in the raw material warehouse, wheels are a big help. TransKit is an application support cart to make mobile operations easy. From its industrial pneumatic wheels with full brake locks to secure housing for the spectrometer and computer, TransKit accommodates testing from shelves to pallets. The TransKit includes its own wiring harness, secure frame for the testing probe and a utility space.

- **Software**

**VISTA Software for NIR Analysis** includes an excellent GMP package for instrument test and calibration with both archiving and print report functions. The program interacts with both Windows 95 and Windows NT platforms. The package, which also contains GRAMS/32 AI, PLSPlus IQ, and LTSlave modbus interface, includes extensive model development routines and provides elegant pictorial views of the statistical data set.

**TRANS Software** is LT Industries' highly-regarded calibration transfer program. These days, eighty percent of all pharmaceutical NIR analyzers are multiples: Similar instruments in use at more than one plant. With TRANS Software, a chemometric model may be developed once and transferred easily from plant to plant.



### Why NIR?

The development of the analytical technique called Near-Infrared (NIR) spectrophotometry is generally credited to Karl H. Norris and William Hruska, scientists at the US Department of Agriculture. The developers applied both NIR vibrational absorptions and heterogeneous sample observation to agricultural materials during the 1970's. The applications of the resulting combined technique were both highly successful and wide-ranging. Virtually every grain elevator in Canada, for instance, uses a NIR spectrometer to blend differing wheat grades for revenue purposes. Crop harvests the world over are dependent on NIR values for payment to the farmer. Milk, sugar, seeds and textile crops such as cotton are all screened by NIR. There are many thousands of NIR instruments in agriculture: they have become a mainstay in harvest assessment and control.

The reasons that NIR is so widely used are its speed and its elimination of the need for sample preparation. In analytical chemistry terms, agricultural products are difficult: sample sizes, average weights and matrix compositions differ markedly, and analytes are often masked by proteins, moisture and long-chain hydrocarbons. When a harvest is underway, the chemist faced with an avalanche of quality-control samples would never be able to provide timely Kjeldahl nitrogen values for example. Rapid, passive NIR can do so, however, and so has become a virtual necessity.

The pharmaceutical industry uses thousands of NIR analyzers for the very same reasons: speed of measurement, freedom from sampling restraints and reagents, affinity for point-of-use testing. Ph. Eur. contains a generic NIR method. USP is in dialogue with the USFDA to incorporate a similar method in the next issue. The USFDA approved NIR as a bulk pharmaceutical release method -- replacing three compendial methods -- as long ago as 1992.

### Want more information?

LT Industries publishes The NIR Desk Reference, a handbook to aid in understanding the principles and applications of NIR. Write for a copy.



## Near Infrared Technology at Work

### Spectrometer Specifications (Basic Unit)

Reliability:	Designed for twenty-four hour operations without shut-down.
Spectral range:	1200 - 2400 nm
Scanning speed:	2.5 scans per second
Spectral addition:	Scans may be added under computer control
Measurement modes:	Reflectance, Transmittance, Transflectance
Data interval:	1 nm (1200 points over the spectral range)
Bandwidth:	10 nm
Photometric range:	5 Absorbance Units
Photometric noise:	< 40 $\mu$ AU, 15 $\mu$ AU typical (0 AU absorber, 50 scans averaged)
Wavelength accuracy:	<0.015 nm
Wavelength repeatability:	0.01 nm
Stray light:	0.1% or better
Light geometry:	Optimized for minimum specular reflectance and maximal S/N
Auxiliary port:	Computer controlled for alternative sampling
Possible signal output:	Multiple 4-20 mA, multiple voltages
Power:	120V, 3.5 Amp, 60Hz or 220V, 1.8 Amp, 50 Hz
Power transients:	Filtered
Dimensions:	12" x 15" x 13" (HWD) 30.5 cm x 39.7 cm x 34.9 cm (HWD)

Specifications subject to change without prior notification

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