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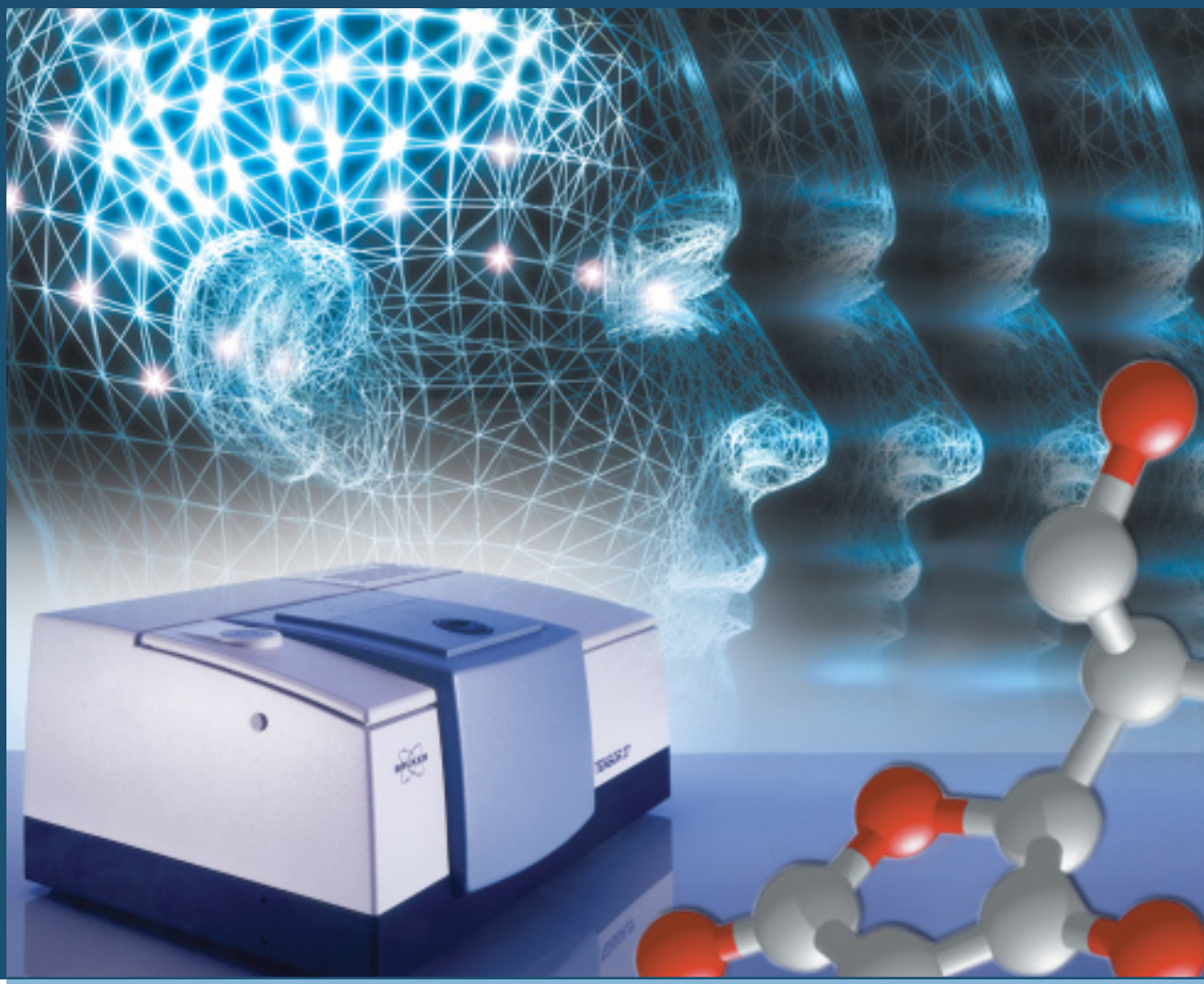
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thinkforward



TENSOR™ series

FT-IR spectrometer

for today's and tomorrow's laboratories

BRUKER Optics

TENSOR™ series



The *TENSOR*™ series is the result of Bruker's 30 years of experience in the engineering and production of FT-IR spectrometer systems. Designed to provide versatility and high performance, the *TENSOR*™ series sets new standards in FT-IR laboratory analysis, offering a multitude of automatic features, easy operation and quality components.

BRuker Artificial Intelligence Network (BRAIN)

The *TENSOR*™ series ensure easy and reliable analytical work with high sample throughput. A network of intelligent functions such as recognition of sampling accessories and optical components, automatic setup and check of measurement parameters and the on-line continuous testing of spectrometer components makes FT-IR spectroscopy easy, fast and reliable. Software tools like wizards for setup and automatic optimization of evaluation methods complete this outstanding functionality.

Automatic Accessory Recognition (AAR)

Sampling accessories are mounted and pre-aligned on Bruker's QuickLock™ baseplate for fast and reproducible exchange. Immediately after the sampling accessory is locked into the sample compartment, it is automatically recognized by the IntelliSense™ coding. Several test functions verify the performance of the accessory, for example the cleanliness of its ATR crystal. For multi-crystal ATR units, the crystal material is automatically recognized. After all tests are executed, all the parameters are transferred to the OPUS™ software so that the measurement can be started right away.

Automatic Component Recognition (ACR)

All sources, detectors, beamsplitters, etc. on the *TENSOR*™ are electronically coded such that they are recognized by the instrument and the experimental parameters are reconfigured immediately. You don't need to know what parameter set to load; it is all done for you automatically. In addition, if you should install two components which are not used together, the *TENSOR*™ recognizes this, informs you about the mismatch, and offers a solution.

innovative, inspired, intelligent



TENSOR™ offers automation and intelligence capabilities to enable easier use.



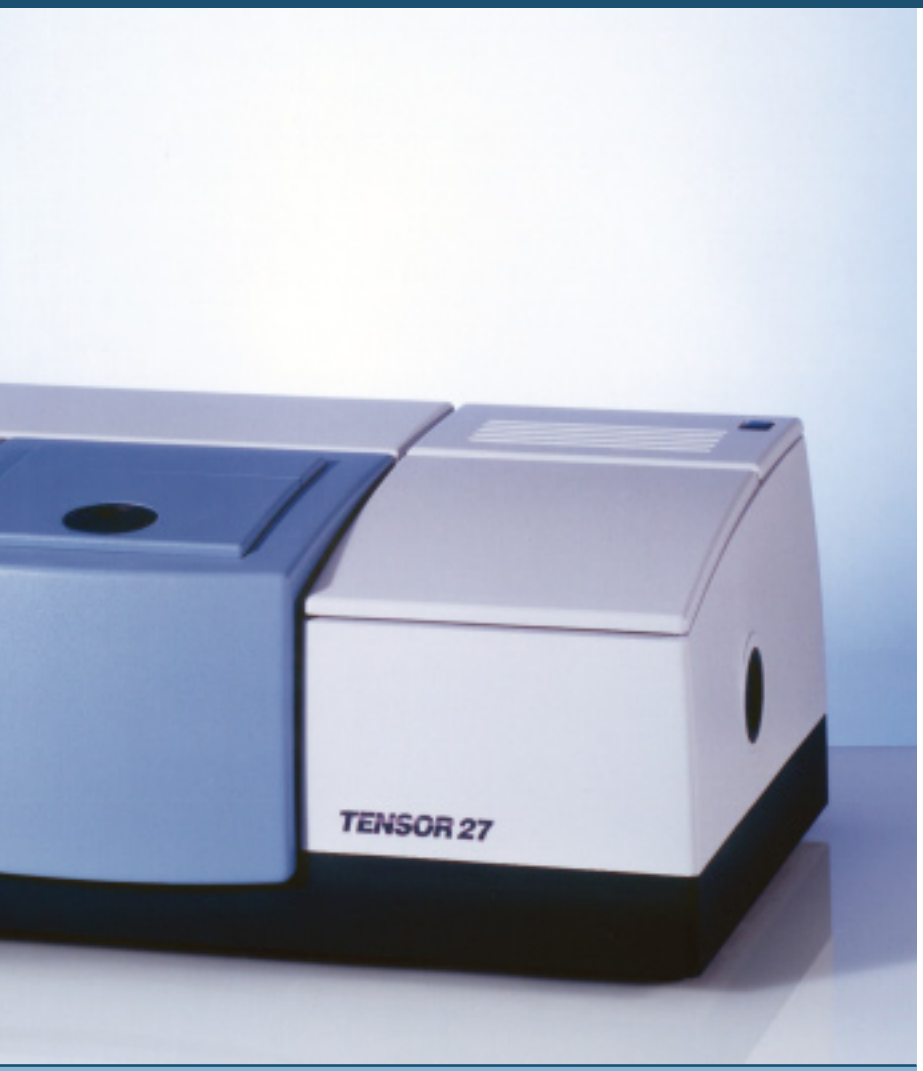
TENSOR™'s large sample compartment allows easy accessory exchange.



TENSOR™ informs the user of any failure and offers online help and tutorials.



TENSOR™ recognizes the accessory change and prepares itself for the next measurement automatically.



TENSOR™ 27

PerformanceGuard™

All optical components installed in the *TENSOR*™ are permanently monitored by the online diagnostic system, PerformanceGuard™, which makes sure that your spectrometer operates correctly. A status light in the OPUS™ software dialog box informs the user of the current instrument status. Whenever a component is out of specification, the user is notified immediately.

Automation

Bruker Optics offers a variety of automation accessories that significantly increase sample throughput in your lab. Automatic sample changers from 2 to 16 positions can perform the most demanding applications reliably with speed and accuracy. The HTS-XT module enables High Throughput Screening (HTS), opening new dimensions in FT-IR spectroscopy with screening of 96, 384 and 1536 well microplates in transmission or in reflection. The standard format microplates can be loaded by robot systems, and the spectrometer can be adapted to any LIMS.

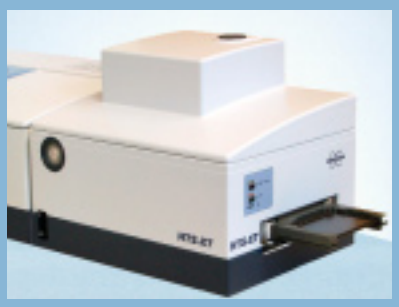
How much active substance is in these tablets ?

The measurement of the tablet is performed with a *TENSOR*™ equipped with a Micro-ATR sampling accessory. The measurement result is evaluated with the OPUS/QUANT software package using modern chemometric algorithms. It takes only seconds from the start of the measurement to the result of the quantification.



Control of cell cultivation process?

With innovative accessories for automation, samples can be loaded on microplates and placed to the Bruker HTS-XT module. Measurements and data evaluation are performed automatically and results are transferred to a spreadsheet. This method can extend the use of FT-IR spectroscopy to 24 hours operation, which is ideal for life science applications.



Is this raw material correct?

Starch powder is delivered for a production process. When the material is received, it has to be checked to verify if the specifications for this incoming material are met. A *TENSOR*™ with a Micro-ATR sampling accessory is used for the analysis of this starch powder. The measurement and the evaluation of the sample using the OPUS/IDENT package is ready in seconds. The user is informed automatically of the result, and a report is printed.

Thermal stability of pharmaceutical formulations?
The decomposition behavior of a pharmaceutical product is investigated with a *TENSOR*™ in combination with a NETZSCH TG analyzer. The monitoring and identification of the decomposition provides information about the storage stability and the shelf life of a product. The knowledge of the decomposition products helps to avoid the occurrence of undesired by-products formed during storage.



Hit and run car accident?
A piece of car paint found at the scene of an accident was identified with a *TENSOR*™ and a *HYPERION*™ microscope. A microtome cut of a small piece of the car paint was prepared. The measurements were performed with automatic mapping controlled by the OPUS™ software. The make of the car can be identified by comparing the results to a spectral library of car paints.



Are trace contaminants present?
A circuit board from the quality control department needs to be analyzed for possible contamination. Upon visual observation, there are two contaminant particles present. A rapid visualization and analysis of the samples is conducted by using the *HELIOS*™ microscope with the *TENSOR*™ FT-IR spectrometer. The infrared spectra allow ready identification of the particles and their source.



***TENSOR*™ 27 and *HYPERION*™ FT-IR microscope**

High performance

The *TENSOR*™ incorporates state-of-the-art optics for outstanding sensitivity and stability. The heart of the instrument is Bruker's patented, permanently aligned RockSolid™ interferometer, which is equipped with gold-coated optics and has a 30° angle of incidence for maximum efficiency and sensitivity. The permanent alignment provides consistent high quality results, less downtime and outstanding stability.

The *TENSOR*™ FT-IR spectrometer's digital electronics ensures optimum interferometer control, highest sensitivity and long-term stability. Bruker's new DigiTect™ detector system guarantees low noise, making the *TENSOR*™ a powerful routine FT-IR spectrometer with the performance of a research spectrometer.



TENSOR™ series

Flexibility

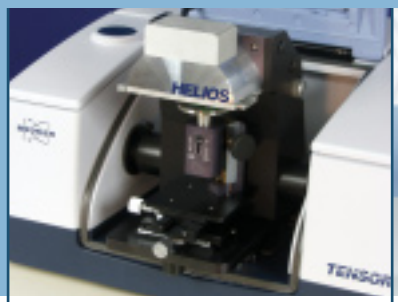
Bruker Optics offers a full line of sampling accessories for its *TENSOR*™ spectrometers, including transmission, ATR, reflection, diffuse reflection and photoacoustic. A wide range of accessories can be mounted on Bruker Optics' proprietary QuickLock™ baseplate for quick, easy, and reproducible mounting in the sample compartment. Sampling capabilities of the *TENSOR*™ series can be expanded by adding an optional external beam port. This allows the attachment of one or more of Bruker's many external accessories, such as an IR microscope, TGA or GC interface, HTS-XT for High Throughput applications or PMA module for VCD or PM-IRRAS.

When demanding infrared analysis of small objects is required, the *HYPERION*™ and *HELIOS*™ microscopes provide the highest level of sensitivity available. The new *HELIOS*™ is a user friendly and cost-effective compact infrared microscope, which provides crystal-clear sample visualization and infrared analysis. The *HYPERION*™ series FT-IR microscopes utilize state-of-the-art optics for optimal sample visualization and infrared data collection. Software automation of the *HYPERION*™ controls the modes of operation, which includes mapping and focal plane array imaging. For specialized applications, many optical and infrared objective options are available, including the patented grazing angle objective for monolayer analysis.

Expandability

The *TENSOR*™ 37 allows the user to easily exchange the optical components and convert the system to a powerful FT-NIR spectrometer system - and vice versa. The NIR capabilities of the *TENSOR*™ 37 open up a new realm of sampling possibilities. NIR has several distinct differences from Mid-IR that make it very useful for QA/QC analysis. Bands in the NIR are less intense than those in the Mid-IR, thus samples can be measured without dilution. Since Glass vials are transparent in NIR, the samples can be analyzed in their containers. Quartz fiber optics allow the NIR light to be transmitted over long distances for remote measurement and process control.

rugged, reliable, revolutionary



TENSOR™ and *HELIOS*™ offers an easy and affordable FT-IR microanalysis solution.



TENSOR™ detectors fit into their position easily and are recognized automatically.



NIR fiber coupling unit enables the use of fiber optic probes for sample analysis.



TENSOR™ 37 offers easy beamsplitter exchange without alignment.

TENSOR™ series



Validation

TENSOR™ series FT-IR spectrometers are equipped with an automated filter wheel which houses standard materials and filters for testing instrument performance. Included in the OPUS™ software is AutoCheck, an instrument test program which executes a series of performance tests using the standards in the filter wheel. This program evaluates the instrument performance and determines if the instrument is operating within specifications. This, in addition to Bruker's Validation Handbook, provides the user with a complete package to assist them with their validation and ISO requirements. The implemented qualification routines meet USP, Ph.Eur, FDA and ASTM requirements. OPUS™ allows a dedicated setup of your individual validation needs and the status is always indicated to the user.

Full GLP and 21 CFR Part 11 compliance

OPUS™ spectroscopy software comes equipped with the necessary routines to assist laboratories that must conform to GLP and ISO standards. Extensive user management with multiple security levels, non-editable data files and complete audit trails are some of the many features of this complete spectroscopy software. OPUS™ fully supports the demands of the 21 CFR Part 11 (Electronic Records, Electronic Signatures) regulation issued by the FDA.

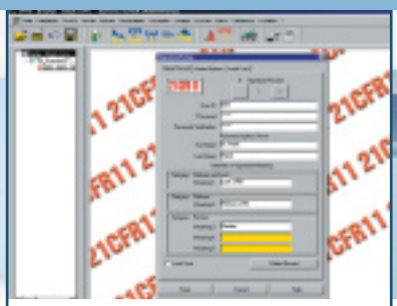
Easy operation

Customizable workspaces, easy measurement mode and wizards to guide you through setup of analytical methods are standard in OPUS™ spectroscopy software. All manipulation and evaluation routines are designed for multiple file operation. These factors make learning the software and the operation of the instrument so easy that even untrained personnel can operate a *TENSOR*™ series spectrometer.

simple, sensitive, superior



Internal Validation Unit change brings new standards to the *TENSOR*™ series users.



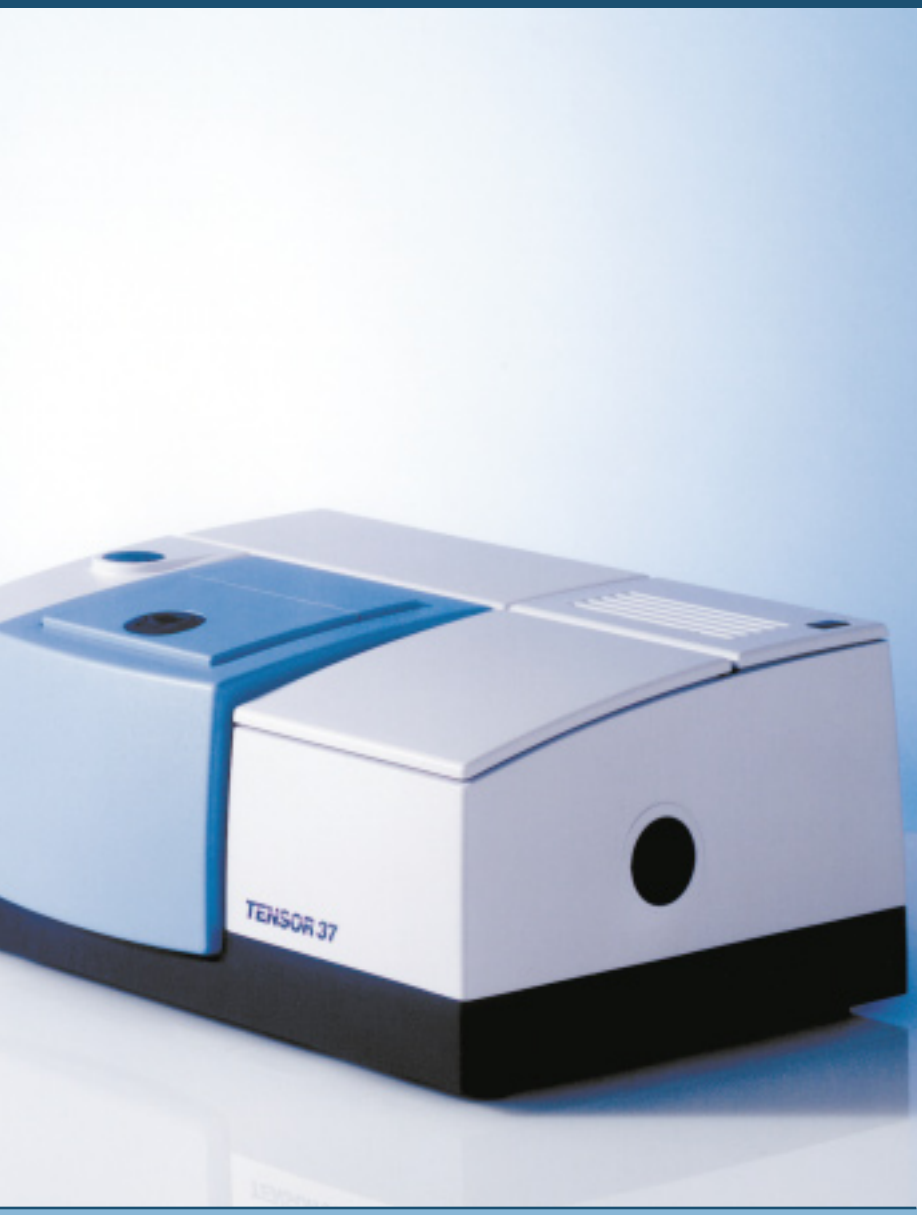
TENSOR™ and *OPUS*™ offers 21 CFR Part 11 and GLP compliance.



The *TENSOR*™ series' pre-aligned laser can be changed manually.



TENSOR™ runs easily over a standard Ethernet connection with a Plug & Play interface.



TENSOR™ 37

Hassle-Free Maintenance

TENSOR™ spectrometers are designed to be easily maintained by the user, thereby decreasing downtime and maintenance costs. Permanent on-line diagnostics ensure the monitoring of the instrument and advise the user of a fault. Consumable items such as the laser and the source are designed for a long life, but if they need to be replaced, the system informs the user of the failure and automatically offers on-line help for the replacement procedure.

The consumables are on pre-aligned mounts and can be easily and quickly changed. These components are located outside of the purged optics area and can be changed without disturbing the internal environment of the spectrometer.

Plug & Play Connectivity

All over the world, no matter where you are, plug in the power and Ethernet connection, and the *TENSOR*™ is ready for operation. The multi-range power supply and the Ethernet connection to the computer, or the local network, ensure this exceptional plug & play functionality. The Ethernet access to the *TENSOR*™ also allows remote control and diagnostics of the spectrometer via your intranet or the World Wide Web.

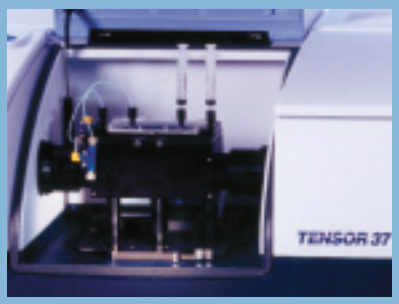
Does our product meet our requirements?

O-rings must be controlled to meet the strict rules of the internal quality requirements. The polymer products are measured with *TENSOR*™ and a Micro-ATR sampling accessory in the sample compartment. The measurements are performed in seconds. After the measurements are done the recorded spectrum is compared to a quality standard using the OPUS™ conformity test.



What are the secondary structure elements of a protein?

Dedicated protein analyzers, such as CONFOCHECK™ are equipped with a high quality flow through cell, AquaSpec™. The IR spectrum of the protein in aqueous solution is recorded and the secondary structure elements are automatically quantified by the OPUS™ software using an extensive internal protein library. Protein-ligand binding and membrane proteins are investigated with a dedicated ATR accessory, BioATRcell™.



Is the raw material correct and what is the water content?

When the different types of incoming raw material, such as flour, are delivered, it can be measured within the packaging using NIR fibers that are coupled to a *TENSOR*™ 37. The identification of the raw flour type and the quantification of ash and water content are performed automatically in seconds by the OPUS/LAB package.

TENSOR™ series



Bruker Optics is staffed by expert scientists and engineers that have an in-depth knowledge of instrumentation and applications. Our product specialists are available to assist you with method development either remotely or in your lab. FT-IR application scientists will assist you in selection and use of sampling accessories, choices of optical components and software operation. We offer customized instruction and support packages to fit your needs.

Bruker spectrometers are designed to provide years of dependable trouble-free operation, but should a problem occur a network of Bruker companies and representatives throughout the world are ready to promptly respond to your needs. Professional installations and a high standard of post-delivery service are commitments Bruker Optics makes to each of its customers. Remote diagnostics in addition to a variety of service contract packages are available for comprehensive support.

BRUKER Optics

for more information, visit:
www.brukeroptics.com/tensor

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