

# *Smart fog*<sup>®</sup>

HUMIDITY FOR LIFE

**100% NON-WETTING**

**jumbo non-clogging orifice**

**Intelligent, energy efficient**

**PRECISE HUMIDITY CONTROL**

**Evaporative cooling**

**4.2 micron, uniform droplet size**

**LOW MAINTENANCE**

**Easy plug & play installation**

**LOW PRESSURE OPERATION**



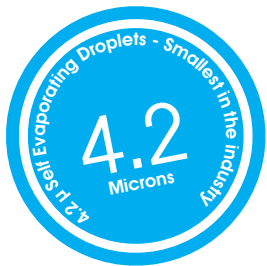
MADE IN THE USA

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# OUR TECHNOLOGY

The Smart Fog® patented technology is based on fractal frequency and de-correlation technology. This technology utilizes precision engineering, which is combined with compressed air and water to reverse the correlation effect. The process creates a consistent water droplet size of 4.2 microns, which is distributed into the air in a consistent and controllable dimensional delivery. Since the droplets are uniformly sized and distributed, you get even, precisely-controlled humidity without wetting exposed surfaces.

## TEN UNIQUE FEATURES & ADVANTAGES



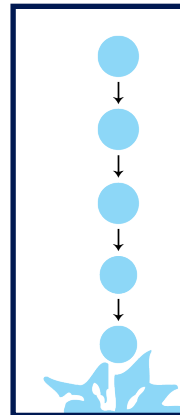
### UNIQUE FEATURE 1: 4.2 MICRON DROPLET

The secret of Smart Fog® lies in the small droplet size of the water and the engineered spacing between the air and water. Smart Fog® has succeeded in manipulating the droplet size to be the smallest in the industry.

#### Why is the droplet size important?

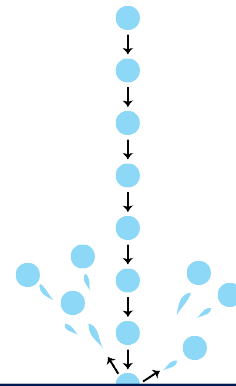
Water evaporates only from the surface of the droplet. If the surface area of the droplet in relation to the volume of water is decreased, then the evaporation efficiency is increased. The smaller the droplet size, the longer it can stay air borne. Therefore, the smaller the droplet size the fastest and efficient evaporation is achieved. The 4.2 micron droplets created by Smart Fog® systems evaporate completely into the air before reaching any surface. Smart Fog® has achieved 100% evaporation rate, achieving 100% water efficiency.

#### WET FOG



Wet Fog droplets burst and wet the surfaces, like rain.

#### DRY FOG



Dry Fog droplets rebound from surfaces, like soap bubbles.

#### SMART FOG



Smart Fog® evaporates completely into the air before reaching the surface.

FOG CLASSIFICATION	DROPLET SIZE	TIME FOR PARTICLE TO FALL 10 FEET (SECONDS)
Wet Fog	11-49	40 - 1,020
Dry Fog	6-10	1,019 - 12,000
Smart Fog®	2-4	12,001 - 25,400

**"SMART FOG IS A FOG THAT DOES NOT MOISTEN THE EXPOSED SURFACES"**

WATER  
DROPLET SIZE  
COMPARISON

4.2 MICRON

Smart Fog

Steam

Air & Water

Ultrasonic

High-Pressure

Centrifugal

## UNIQUE FEATURE 2: ENERGY EFFICIENT NATURAL PROCESS



**Smart Fog® systems use 50-70% less energy to generate humidity than other technologies.**

Smart Fog® technology utilizes a natural decorrelation process. Correlation refers to the cohesion and adhesion properties in water.

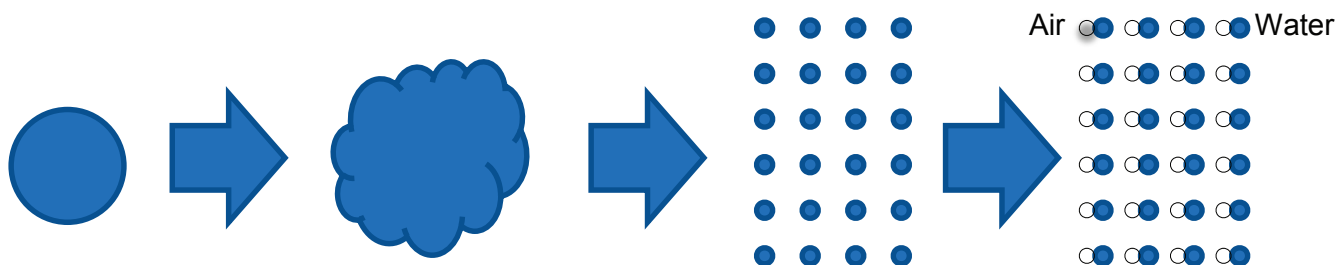
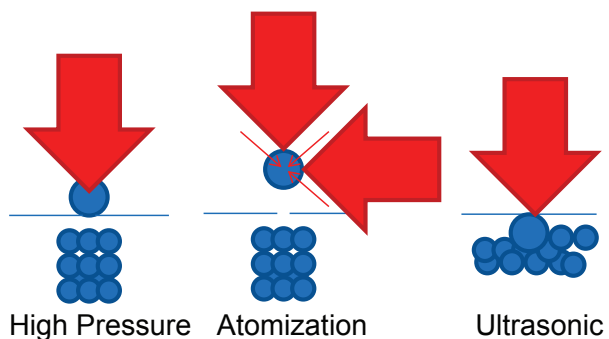
Cohesion: Water is attracted to other water.

Adhesion: Water attracted to other materials.

These effects are caused by the negative charge of the Oxygen molecule and the positive charge of the Hydrogen molecule attracting. Smart Fog® De-Correlation Technology reverses the correlation effect through a non-chemical mechanical process. The technology reverses the cohesion and maximizes adhesion. This process is the most energy efficient way of generating a water droplet.

Smart Fog® technology is based on a natural process (see diagram below).

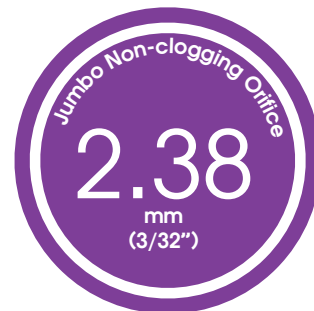
In oppose to forcing the droplets through a tiny hole, using waves to bounce droplets, expanding water through heating or apply force to cut the droplets (see diagram on the right).



## UNIQUE FEATURE 3: JUMBO NON-CLOGGING ORIFICE

The Smart Fog® de-correlation process allows the use of a large orifice both for input and output. A large orifice size means the nozzle can not clog easily. Therefore, ensuring low maintenance.

Additionally - all of our nozzles are made from a high grade 316 stainless steel, allowing any chemical to be used with the system and avoiding any rusting and corrosion.

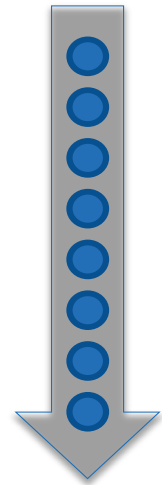
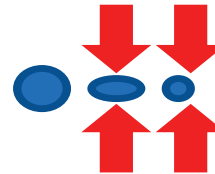
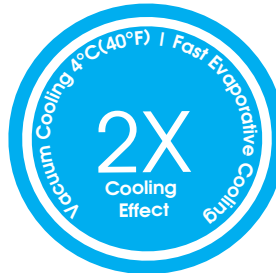


## UNIQUE FEATURE 4: DOUBLE COOLING EFFECT

The Smart Fog® nozzles generate a strong vacuum, which cools both the air and the water. Regardless of the input temperature, the output is always 4°C(40°F).

Additionally, the rapid evaporative cooling caused by the fast evaporation takes the heat from the air.

This is another factor that helps to reduce the energy cost of cooling. For example, in a greenhouses environment, Smart Fog is able to reduce the temperature by 20-25 degrees from outside temperature.



## UNIQUE FEATURE 5: LOW PRESSURE SAFE OPERATION

Smart Fog® utilizes only 100 psi of compressed air. This low pressure operation allows the use of flexible plastic piping making the installation fast and easy. More importantly, the low pressure and non heating mechanism eliminate any human safety factors, and does not require any regulations.

All Smart Fog systems utilize less than 2 AMPs of 24 V DC at their control unit only. The rest of the system is completely pneumatic. This eliminates any human hazards, and makes the installation easier.

## UNIQUE FEATURE 6: INTELLIGENT PRECISE HUMIDITY CONTROL

Smart Fog systems are equipped with a CPLC controller which utilizes our propriety intelligent algorithms to identify the most efficient way to generate the required humidity for any given environment.



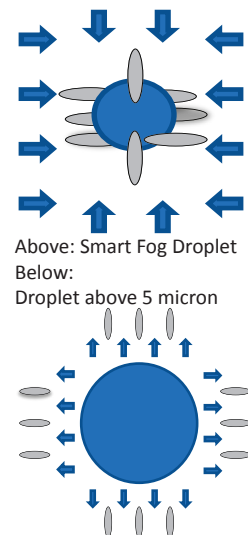
## UNIQUE FEATURE 7: ELIMINATE DUST, MOLD, BACTERIA & VIRUS

The Smart Fog® technology injects Oxygen into every droplet dispensed. Smart Fog® De-Correlation Technology reverses the correlation effect through a non-chemical mechanical process. The technology reverses the cohesion and maximizes adhesion.

Dust and air borne diseases, bacteria, viruses particles and spores are attracted to the Smart Fog droplets by adhesion and are oxidized.

In order to achieve 100% dust suppression, droplets smaller than 5 microns must be in the air. Droplets of 5 microns or larger naturally retract air particles, and doesn't suppress small dust and other air borne particles. Smart Fog technology provides even 4.2 micron droplets which are ideal for 100% dust suppression.

Smart Fog aids in the reduction of dust and air borne bacteria/viruses from the air.



## UNIQUE FEATURE 8:

### 4 FUNCTIONS - 1 SYSTEM

Smart Fog's unique features allows it's system to provide four valuable functions in one compact system:

**1: PRECISE HUMIDITY CONTROL**

**2: FUMIGATION/SANITATION**

**3: COOLING**

**4: DUST SUPPRESSION & STATIC ELIMINATION**



## UNIQUE FEATURE 9:

### PLUG & PLAY INSTALLATION

All Smart Fog® systems are designed for fast and low cost installation. The system does not require the use of any adhesives, and comes with a push-in connectors which can be re-used.

The system is designed to meet the highest industry standards, building codes and electrical requirements. All standard system piping are plastic flexible piping which are extremely durable and easy to install. Smart Fog systems can be mounted on the wall, placed adjacent to air handling units, suspended from the ceiling or inserted into ducts.



## UNIQUE FEATURE 10:

### EXTENDED WARRANTY

All Smart Fog® systems come with comprehensive one year warranty.

We also provide a comprehensive economical extended warranty plan, covering all equipment.





## SCALABLE SOLUTIONS TO FIT YOUR EXACT NEEDS



Smart Fog Humidification products have a wide range of applications ranging from industrial humidification to residential household use. It's commonly known that humidity plays a significant role in personal comfort, but humidity levels that are too high or too low can cause serious problems and may even pose a health risk. Smart Fog systems provide precise humidity control to meet your requirements while keeping all surfaces dry, eliminating mold/bacteria growth.

# APPLICATION EXAMPLES

NON-WETTING HUMIDIFICATION

STATIC ELIMINATION / DUST SUPPRESSION

SANITATION / FUMIGATION

EVAPORATIVE COOLING

### HUMIDITY CONTROL

- Wine Cellars
- Cold Storages
- Ripening Rooms
- Textile
- Printing
- Clean Rooms
- HVAC/Buildings
- Data Centers
- Mushroom Production



### DUST SUPPRESSION

- Mines
- Recycling Plants
- Poultry
- Woodwork
- Construction



### SANITATION

- Food Safety
- Classroom Disinfection
- Produce Packing
- Mold Disinfection
- Disease Control



### COOLING

- Greenhouses
- Turbine Pre-Cooling
- Outdoor Cooling
- Plant Cooling
- Nursery/Propagation



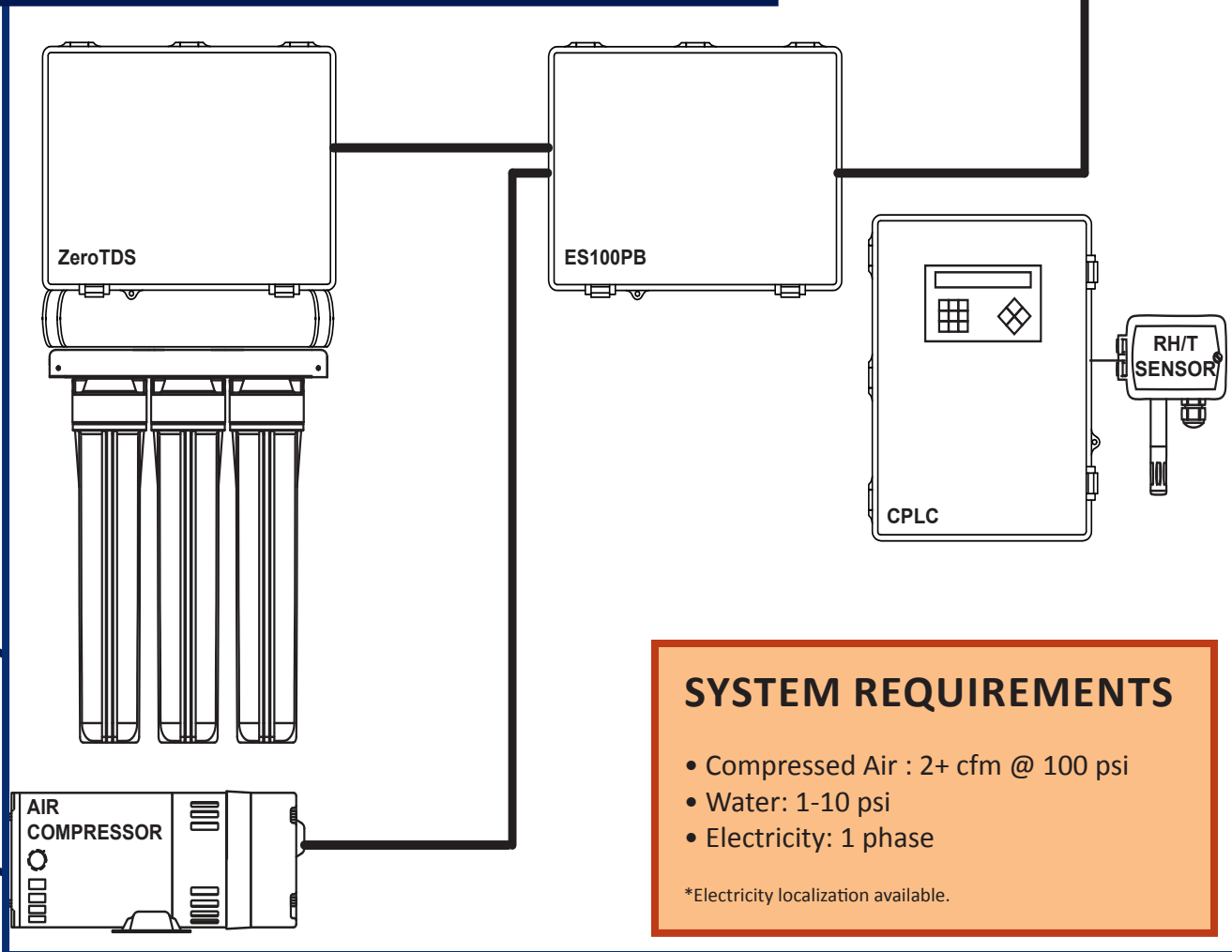
## TYPICAL SMART FOG® ES100 SYSTEM SETUP

The ES100 Humidification Solution includes the following components:

- ES100 Humidifier
- CPLC Intelligent Controller
- ES100PB Control Center
- S-Series Relative Humidity & Temp Sensor

Optional:

- Chemical Injection System
- ZeroTDS® Water Filtration System



## SYSTEM REQUIREMENTS

- Compressed Air : 2+ cfm @ 100 psi
- Water: 1-10 psi
- Electricity: 1 phase

\*Electricity localization available.

## HOW DOES IT WORK?

### SYSTEM COMPONENTS

# PRODUCT DETAILS & SPECIFICATIONS

## ES100 SERIES

Our most popular model, the ES100 is an easy to use “plug and play” non-wetting humidifier. It is designed to meet the humidity requirements of a majority of commercial, industrial and agricultural applications.



## STANDARD MODEL TYPES & SPECS

### ES100-1

CAPACITY: 0 TO 1.5GPH  
MINIMUM TEMPERATURE: 50°F  
COMPRESSED AIR REQUIREMENT: 2CFM @110 PSI  
WATER PRESSURE REQUIREMENT: 10 PSI

### ES100-2

CAPACITY: 0 TO 3GPH  
MINIMUM TEMPERATURE: 50°F  
COMPRESSED AIR REQUIREMENT: 4CFM @110 PSI  
WATER PRESSURE REQUIREMENT: 10 PSI

## FOR COLD TEMPERATURES

### ES100-1H

CAPACITY: 0 TO 1.5GPH  
MINIMUM TEMPERATURE: 28°F  
COMPRESSED AIR REQUIREMENT: 2CFM @110 PSI  
WATER PRESSURE REQUIREMENT: 10 PSI

### ES100-2H

CAPACITY: 0 TO 3GPH  
MINIMUM TEMPERATURE: 28°F  
COMPRESSED AIR REQUIREMENT: 4CFM @110 PSI  
WATER PRESSURE REQUIREMENT: 10 PSI

MOBILE OPTION AVAILABLE.

## MS100

FOR LARGER APPLICATIONS OR HUMIDITY NEEDS. THIS MODEL WAS ENGINEERED FOR COMPLEX, LARGE-SCALE HUMIDITY CONTROL APPLICATIONS, SUCH AS DUST SUPPRESSION AND GREENHOUSE/NURSERY OPERATIONS OVER 10,000 SQ FEET.

## SS100

COMPLETE SOFT FOG SOLUTION FOR EXTREMELY WATER SENSITIVE ENVIRONMENT. CAN OPERATE UTILIZING ONLY 20 PSI OF COMPRESSED AIR PRESSURE.

## FOG TUNNEL

THE FOG TUNNEL IS A COMPLETE FOOD SAFETY SOLUTION. IMPLEMENTED ON ANY EXISTING CONVEYOR SYSTEM OR CUSTOM MANUFACTURED FOR NEW INSTALLATIONS. THE CONTAINED STRUCTURE HELPS LIMIT WORKER EXPOSURE OF THE DISINFECTANT.



## SYSTEM COMPONENTS

ALL OF OUR SYSTEMS COME WITH AN INTELLIGENT CPLC CONTROLLER, PB CONTROL BOX AND A HUMIDITY SENSOR.

### ES100PB CONTROL BOX

SMART FOG® ES100PB CONTROL UNIT IS A RELIABLE CONTROL CENTER FOR THE ES100 SYSTEM. EASY PLUG & PLAY INSTALL AND MAINTENANCE FREE DESIGN PROVIDES A DURABLE INDUSTRIAL SOLUTION FOR HUMIDITY CONTROL APPLICATION.

### CPLC CONTROLLER

SMART FOG® CPLC CONTROLLER UNIT IS AN INDUSTRIAL RELATIVE HUMIDITY AND TEMPERATURE CONTROLLER. THIS UNIT PROVIDES ACCURATE, USER FRIENDLY CONTROL INTERFACE. PROPRIETARY INTELLIGENT ALGORITHMS PROVIDE UNSURPASSED ACCURACY AND SET AND FORGET FUNCTIONALITY.

### S SERIES RELATIVE HUMIDITY SENSORS

THE SMART FOG® S SERIES RELATIVE HUMIDITY SENSORS ARE DESIGNED TO WITHSTAND HARSH ENVIRONMENTS, AND PROVIDE ACCURACY OF 1% AND 0.1% (DEPENDENT ON THE MODEL). ALL SENSORS ARE EQUIPPED WITH TEMPERATURE COMPENSATION.

## OPTIONAL SYSTEM COMPONENTS

### CHEMICAL INJECTOR

FULLY AUTOMATED PRECISE INJECTION OF ANY WATER DISSOLVING MATERIAL. NO PRIMING REQUIRED. USER-FRIENDLY INTERFACE ALLOWS DIGITAL INPUT OF THE DESIRED RATIO.

### ZeroTDS® WATER FILTER

SMART FOG® ZEROTDS® FILTER SYSTEM IS A FOUR STAGE FILTER WHICH REMOVES ALL MINERALS FROM THE WATER, PROVIDING PURE DI WATER.

# FREQUENTLY ASKED QUESTIONS

HERE ARE SOME OF THE QUESTIONS WE GET ASKED FREQUENTLY. IF YOU HAVE ANY ADDITIONAL QUESTIONS, PLEASE CALL OR E-MAIL US AND OUR DEDICATED TEAM WILL BE HAPPY TO ANSWER!

## **Q: What is required for the system to operate?**

A: The system operates using compressed air and water. The system requires at least 100 psi (or can be calibrated lower if needed) of compressed air and any water pressure available (even a reservoir with no pressure). Power is required only for the CPLC control unit. The unit requires any available 1 phase AC voltage, 2A.

## **Q: What is the power consumption of the system?**

A: At maximum full capacity, each ES100-1 unit utilizes 0.6 kW, and each ES100-2 unit utilizes 1.2 kW. From data taken from our customers, it shows that the average consumption for each ES100-1 unit is 0.2 kW, and for each ES100-2 unit is 0.4 kW.

## **Q: How are ES100 units installed?**

A: The ES100 units can be either wall mounted next to the air handlers, suspended from the roof or inserted in the duct system. The installation is specifically designed for plug and play and does not require any special tooling. All of our standard piping are flexible plastic pipes which makes the installation quick and easy.

## **Q: What kind of water is required to run the system? Is hard water an issue?**

A: Hard water is not an issue for our system. Our main concern with water quality is the silica level in the water. If Silica is present, we offer a ZeroTDS® filter system which extracts all the minerals from the water. If dust is a concern, we highly recommend having the ZeroTDS® water filtration, to avoid any dust generated by the mineral content in the source water.

## **Q: Can expensive machinery be placed right under the humidifiers?**

A: Yes. Our system is specifically designed as a non-wetting humidification system. Which means that it would not wet anything underneath it. The system is also designed to avoid condensation by gradually building the humidity.

## **Q: Does the humidifier require any type of drainage?**

A: The system utilizes 100% of the water, and therefore does not require any drainage.

## **Q: Does the system require any screens or filters to filter out large droplets?**

A: No, the system generates even 4.2 micron droplets which evaporate directly into the air, thereby eliminating the need for a screen in the duct work or in open space.

## **Q: Does the system require any cleaning or regular maintenance?**

A: No, the system is constantly being oxidized thereby cleaning the nozzles automatically. The system is manufactured from high grade plastic and 316 stainless steel, so there is no corrosion or build up. The only maintenance required is replacing the filter elements every 2 years.



## ABOUT US

For over 30 years, customers have trusted Smart Fog humidification systems to help lower costs, protect their products, and provide precise, even humidity control for their operations. We've earned our reputation for superb performance and reliability by making equipment which scales well for facilities of all sizes, delivering consistent results, and solving humidity control problems for a wide range of different applications.

We make it our responsibility to know you and your business. We work closely with you to ensure that the solutions we provide are tailored to meet your unique needs and challenges. At Smart Fog, we are committed to your success.

The logo features the words "Smart fog" in a blue, cursive script font. A registered trademark symbol (®) is located at the top right of the word "fog". Above the text, several dark blue lines radiate from the top left corner towards the right, resembling sun rays. Below the logo, the tagline "HUMIDITY FOR LIFE" is written in a dark blue, all-caps, sans-serif font. In the bottom right corner, a white rectangular box with a dark blue border contains contact information. Five dark blue lines radiate from the top left corner of this box, extending upwards and to the left, crossing over the tagline and the logo.

*Smart fog*®

HUMIDITY FOR LIFE

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