



Integrated LED Hood Light vs. Traditional Tube-in-Box Design

Engineered for Commercial Kitchen Ventilation Hoods

A structural and performance comparison covering heat dissipation, corrosion resistance, condensation control, hygiene and service life.



Integrated LED Hood Light



Purpose-Built Design



Integrated Thermal Management



Sealed IP65 Construction

VS



Traditional Tube-in-Box Design



Generic Tube-Based Structure



Multiple Joints and Openings



Limited Environmental Protection

More Than a Tube Replacement.

A Purpose-Built Lighting System for Demanding Commercial Kitchens.

WHY CONVENTIONAL HOOD LIGHTS FAIL IN COMMERCIAL KITCHENS

The environment inside ventilation hoods is extremely harsh.
Traditional tube-in-box designs are not purpose-built and are prone to failure.



HIGH TEMPERATURE

Prolonged exposure to high temperatures accelerates LED and driver aging.



STEAM & HUMIDITY

Continuous steam and humidity can cause condensation and water ingress.



GREASE & OIL FUMES

Grease and oil vapors adhere to surfaces, affecting heat dissipation and hygiene.



CLEANING CHEMICALS

Frequent cleaning with detergents and chemicals causes corrosion and coating damage.



VIBRATION

Exhaust fans cause constant vibration, leading to loosening and structure fatigue.



CONDENSATION RISK

Temperature changes create pressure differences and condensation, damaging electronics.



These harsh conditions lead to:

Rapid light decay | **Frequent failures** | **Corrosion and rust** | **Higher maintenance cost** | **Food safety risks**

You need a lighting solution that is engineered for this environment.

TWO DIFFERENT ENGINEERING ARCHITECTURES

The performance difference starts with how each lighting system is designed.

INTEGRATED LED HOOD LIGHT

Purpose-Built. Integrated. Reliable.



1



Integrated LED Module

LED engine, driver and components are integrated into a sealed housing.

2



Direct Aluminum Thermal Path

Heat transfers efficiently from the LED module through the aluminum base to the hood body.

1.5mm Aluminum Thermal Structure

3



Integrated Sealing Structure

Fewer penetrations and sealed construction help resist moisture, grease and contaminants.

4



Pressure Equalization Vent

Helps balance internal and external pressure to reduce moisture ingress. *

TRADITIONAL TUBE-IN-BOX SYSTEM

Multiple Components. More Interfaces. More Risks.



1



Multiple Components

Separate tubes, holders, drivers and wiring create a more complex system.

2



Indirect Heat Transfer Path

Heat must pass through multiple parts and air gaps before reaching the enclosure.

3



Multiple Interfaces & Openings

More penetrations, joints and gaps increase the risk of moisture and grease ingress.

4



No Built-in Pressure Vent

Without pressure equalization, internal moisture may build up and affect components.

* Available on selected configurations.

SUPERIOR THERMAL MANAGEMENT

Better heat dissipation means longer life, stable performance, and lower failure risk.

JTC INTEGRATED LED HOOD LIGHT SYSTEM



Direct Heat Path. Efficient Dissipation.

Heat is transferred directly from the LED module to the aluminum thermal base and released to the hood body.

 **4X Faster Thermal Transfer**



LED Module



Aluminum Thermal Base



Heat Spreading



Hood Body / Environment



Optimized thermal path reduces LED junction temperature, supporting driver reliability and extended LED life.

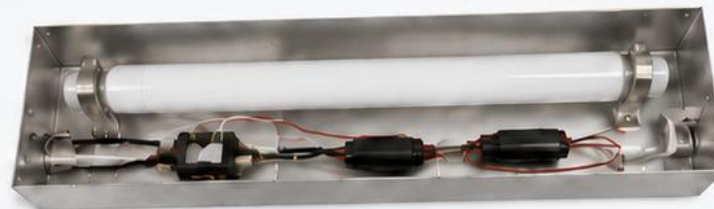
VS.

TRADITIONAL TUBE-IN-BOX SYSTEM



Indirect Heat Path. Poor Dissipation.

Heat must pass through air gaps and thin metal, causing heat accumulation inside the enclosure.



LED Tube / Fluorescent Tube



Air Gap



Thin Metal Box



Heat Build-up



Higher internal temperature accelerates component aging and shortens overall service life.

MATERIAL ADVANTAGE



Aluminum

≈ 200 W/m·K

Thermal Conductivity



Steel

≈ 50 W/m·K

Thermal Conductivity

Materials have inherent thermal conductivity differences. Aluminum offers a higher conductivity than steel in typical applications.



Important: Effective thermal performance depends on thermal path design, contact area and operating conditions.

SEALED FOR PERFORMANCE. BUILT FOR KITCHENS.

Integrated sealing and controlled pressure management help protect internal components from grease, vapor and moisture.

JTC INTEGRATED LED HOOD LIGHT SYSTEM



Pressure equalization vent applies to vent-equipped models.

VS.

TRADITIONAL TUBE-IN-BOX SYSTEM



RESULT:



Keeps
Contaminants Out



Supports
Condensation Control



Protects
Component Life



Maintains
Long-Term Reliability

MAINTENANCE & CLEANING: SIMPLER, FASTER, SAFER

Purpose-built design reduces maintenance time and improves cleaning efficiency.

JTC INTEGRATED LED HOOD LIGHT SYSTEM



Quick Access

Simple structure for fast inspection and component replacement.



Smooth Surfaces

Flat design with minimal edges for easier wipe-down cleaning.



Fewer Parts

Integrated system means fewer parts to check, clean and replace.



Lower Maintenance Cost

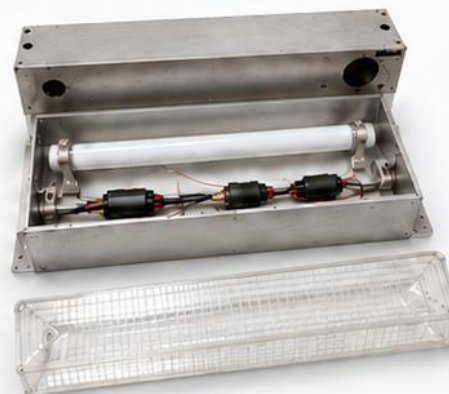
Less downtime, less labor, lower total cost of ownership.



Designed for long service intervals and easy upkeep in demanding environments.

VS.

TRADITIONAL TUBE-IN-BOX SYSTEM



Time Consuming

Multiple components increase inspection and replacement time.



Hard to Clean

Gaps, edges and crevices trap grease and food residue.



Many Parts to Maintain

Tubes, holders, wiring and covers require frequent attention.



Higher Maintenance Cost

More labor, more parts, more downtime.



Complex structure leads to longer maintenance time and higher operational cost.



MAINTENANCE IMPACT



Reduced Maintenance Effort

Easier access and fewer parts mean less time spent on maintenance.



Simplified Cleaning Process

Smooth, flat surfaces make cleaning faster and more effective.



Fewer Replacement Components

Integrated design reduces the number of parts that need inspection or replacement.



Better Long-Term Serviceability

Built for durability and easier servicing to support long-term reliability.

LOWER LIFECYCLE RISK. HIGHER RELIABILITY.

Integrated design minimizes failure points and extends overall service life.

JTC INTEGRATED LED HOOD LIGHT SYSTEM



Fewer Failure Points

Integrated structure eliminates multiple joints, sockets and openings that can fail.



Longer Service Life

High-quality components and thermal management extend LED and driver lifespan.



Stable Performance

Consistent light output and reliability in high-heat, high-humidity kitchen environments.

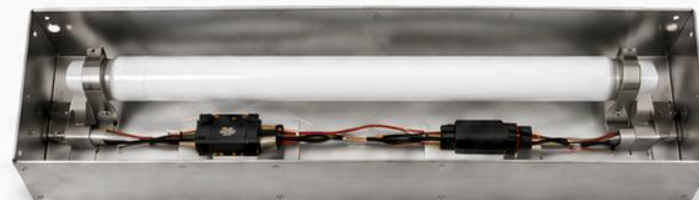


Lower Lifecycle Cost

Less maintenance, fewer replacements, lower total cost of ownership.

VS.

TRADITIONAL TUBE-IN-BOX SYSTEM



Multiple Failure Points

Many joints, sockets, penetrations and components increase the risk of failure.



Shorter Service Life

Heat accumulation and moisture degrade components and shorten lifespan.



Unstable Performance

Light output degrades over time; more prone to flicker and early failure.



Higher Lifecycle Cost

Frequent maintenance and replacements increase total cost.



Engineered as a **complete system** to protect components, ensure consistent performance, and deliver **long-term value** in demanding kitchen environments.



Enhanced
Reliability



Extended
Lifespan



Reduced
Maintenance



Lower
Ownership Cost

SUMMARY: ENGINEERED FOR A BETTER OUTCOME.

Integrated design delivers measurable advantages across key engineering and operational factors.



Integrated design is not just a product upgrade—it is a system upgrade.

It reduces risk, simplifies operations and delivers long-term value.

COMPARISON FACTOR	JTC INTEGRATED LED HOOD LIGHT	TRADITIONAL TUBE-IN-BOX
 Thermal Management	✓ Direct heat path, better dissipation	✗ Heat trapped, poor dissipation
 Sealing & Protection	✓ Continuous seal, IP65 protection	✗ Multiple gaps, moisture ingress
 Cleaning & Hygiene	✓ Smooth surfaces, easy to clean	✗ Crevices and gaps, hard to clean
 Maintenance	✓ Fewer parts, quick access	✗ Many parts, time consuming
 Reliability	✓ Fewer failure points, more reliable	✗ Many failure points, higher risk
 Service Life	✓ Longer lifespan, stable performance	✗ Shorter lifespan, output degrades
 Lifecycle Cost	✓ Lower maintenance, lower total cost	✗ Higher maintenance, higher total cost



A SMARTER CHOICE FOR COMMERCIAL KITCHEN HOODS.

Better engineering. Better performance. Better value.



Lower Risk



Simpler Operation



Higher Reliability



Lower Total Cost