

Shielding Operators: Preventing Heatstroke at a Propane Refill Station

Gas One Holdings Co., Ltd.

About the company

Offering household energy services under brands like "Gas One," "Ene One," and "Water One," Gas One Holdings Co., Ltd. contributes to local communities as the "most accessible home energy partner". Having implemented our LYOHM System (a mist cooling system), Gas One Park Ageo is one of Japan's largest inland LP gas centers, equipped with the latest tech and a centralized management system to ensure a stable LP gas supply and rigorous safety.



"Being in an explosion-proof area, regular cooling equipment wasn't an option. That's why we introduced mist cooling—to help protect the people working here now from the heat."



It all started with a newspaper article

We had always been concerned about the heat at the site and constantly felt that something needed to be done. Then, I came across an article in the LP Gas Industry News about another gas center's renovation, where mist cooling was installed as one of the new facilities.

The two of us thought, "This sounds interesting," and from there, everything progressed smoothly. We noticed the name of a contractor we know well in the article, so we called them right away, and they introduced IKEUCHI, the mist cooling specialist, to us.

Driven by the urgency to act quickly, we didn't spend much time comparing our options with other companies' systems, but **they brought us a demo unit right after our call.**

We'd already been using pneumatic nozzles in certain areas, but they were noisy and kind of inconvenient because they needed compressed air. Compared to those, the new system was noticeably quieter, and testing the cooling effect firsthand made us confident it would work well.

Tackling heat management in an outdoor, explosion-proof area

Meeting safety standards in an explosion-proof area means no conventional fans, spot coolers, or even air-conditioned clothing. We couldn't get the space as cool as in an office, but we wanted to do everything possible. Installing mist cooling was a lucky break.

Filling operations in extreme heat

During the construction of the filling station last year, we often visited the site. It was sweltering—just standing there made us feel faint.

And even in that heat, **safety protocol requires long sleeves, tucking in our shirts, and putting on leather gloves.** Just wearing this gear in the middle of summer makes for a harsh environment already.

On top of that, work at the filling station is both intensely hot and physically demanding. While gas filling is automated, operators still have to set empty cylinders onto the conveyor and unload and arrange the filled ones by hand.

Each filled cylinder weighs nearly 90 kilograms, and operators handle about 2,000 of these each day, tilting, rolling, and arranging them by hand.

This creates a serious risk of health issues, making heat countermeasures at the filling station an urgent necessity.



▲Operators tilting and rolling nearly 90-kilogram cylinders into place

The mist cooling felt noticeably different

We hadn't had any reported cases of heatstroke or other health issues before, but often saw operators getting exhausted and taking breaks. Since implementing the mist cooling, we no longer hear comments like, "I feel like I'm about to collapse," or complaints about the heat. After we installed it, we went on-site ourselves, and it felt totally different. When we checked the thermometer, it showed a **3–4 degree Celsius drop** compared to before.

Also helping keep cylinder storage temperatures below 40°C, in compliance with the High Pressure Gas Safety Act

The impact of the implementation wasn't just on the people. According to the High Pressure Gas Safety Act, **container storage temperatures must be kept below 40°C**. In the peak of summer, when temperatures went over 40°C, **we used to hose them down with tap water**.

Now, the filled cylinders are positioned right where the mist is sprayed, which I believe helps to some extent in maintaining the storage temperature.



We did everything we could—mist cooling, fans, air-conditioned clothing—you name it

Along with the implementation of mist cooling, we did everything we could to make the environment even a little more comfortable. First, to help spread the mist more effectively, we decided it would be a good idea to add explosion-proof fans.

Up until now, we couldn't use regular air-conditioned clothing at the filling station since it needs electricity. But with the release of new explosion-proof air-conditioned clothing, we were able to provide it to all our operators.

With mist cooling, explosion-proof fans, and air-conditioned clothing, I think we've created the best environment possible with everything we have right now.



▲Using explosion-proof fans to spread more mist towards operators

Aiming to help protect the people working here now from the heat

Improving the work environment is, of course, aimed at securing and retaining human resources, but more than that, we first needed to do something for the people working here now. **With the extreme heat we've seen in recent years, our main concern was to help those struggling right in front of us.**

The team at the filling station has always been resilient and dedicated, working through such harsh conditions. But as the generations change, we may not always have people with that same level of endurance.

We were concerned that if this extreme heat continues, there might come a time when no one wants to work at the filling station. With each year getting hotter, **we have to start accepting that this intense heat is no longer unusual—this is our new normal.**

At Gas One Park Ageo, our mission is to keep our facilities in optimal condition, and within our group, we've been fortunate to have relatively more flexibility in allocating expenses for necessary improvements.

However, gas filling stations everywhere face similar challenges. For the sake of those working in these harsh conditions, **we hope that heat countermeasures like the mist cooling system we implemented can spread throughout the industry.**



▲Mist cooling system also installed the tank truck station

Product Details

LYOHM System for mist cooling in large outdoor space to combat urban heat island effects and heat stress

An outdoor cooling system capable of mitigating heat stress or dryness across a broad area through water spraying.

The system lowers ambient temperature using the heat of vaporization of the fog, without emitting exhaust heat, and operates with minimal energy.

It utilizes an ultra-fine fog known as "Semi-dry Fog", with a mean droplet diameter of 10 to 30 μm, which evaporates instantly upon contact with surfaces, providing a cooling effect without leaving moisture.



Outline of the installed system

Site area Approx. 1,930 m²

Products installed

- Pump unit (1)
- 4-meter spray nozzle headers with 8 nozzles each (47)
- 2-meter spray nozzle headers with 4 nozzles each (6)
- Fittings and high-pressure hoses

Total spray volume 960 L/h

Please feel free to send any inquiry, request for information to the contact below.



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