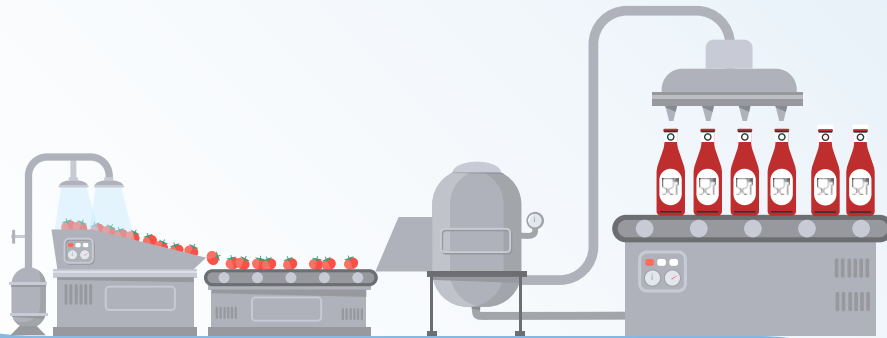


## Innovations in Steam:




## Achieving Food Contact Materials



## Compliance





***This new chapter for steam will have a global impact, both for the food and beverage industry itself, and the OEM (Original Equipment Manufacturer) sector that supplies them.***



# Introducing a milestone for steam in F&B

To say that steam plays a vital role in the food and beverage industry downplays its achievements. Just as the quality of the natural ingredients is a key factor, steam brings unique, valuable benefits to help any process that turns these into the products we consume.

But, if you're reading this paper, you probably already know this. If steam is a key part of your process, or you supply the industry, then you'll be well aware there is no more efficient, reliable, and safe way to transfer heat. Its ability to easily reach the point where it will be used makes it an essential tool for countless F&B businesses.

Its work doesn't stop with the actual manufacture of food and drink products. No other medium brings the assurance that the risk from pathogens is minimised, or that the containers food ends up in are safe, giving maximum shelf life.

We've been global leaders in engineering the very best results from steam for decades, working hard to ensure it fulfils its efficient, optimised, and sustainable potential. That focus remains a fundamental part of our service.

But, naturally, over time, how steam is used evolves. We are always searching for ways to improve its credentials as the ultimate source of thermal energy in the F&B industry, often at the request of our customers.

This paper focuses on a new area for steam; the role of food contact materials (FCMs) and their impact on food and drink production. In it, you will discover what the FCM legislation involves, come to understand why it is essential to consider steam when evaluating them, and reveal a pioneering initiative for the industry.

One which reinforces steam's pivotal place in the sector, enhancing its reputation for being versatile, efficient, and safe. This new chapter for steam will have a global impact, both for the food and beverage industry itself, and the OEM (Original Equipment Manufacturer) sector that supplies them.

# What is a FCM and the need for regulation

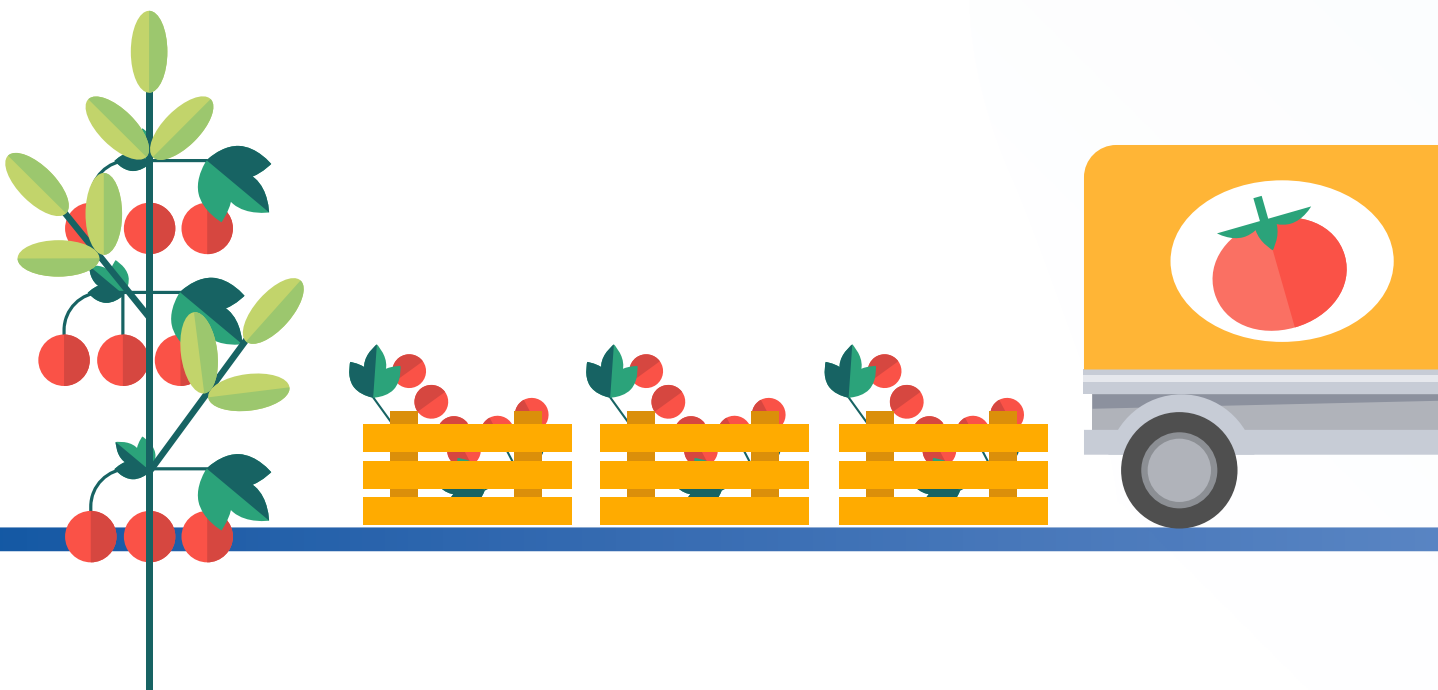
Just as steam has advanced the food and drink industry's ability to produce at scale, safely and efficiently, it's difficult to overstate the industry's importance. All of us need to eat and drink to survive. That is something that transcends national borders, ignores language barriers, and makes the sector fundamental to our existence.

Understandably, making sure the things we consume are safe is a key priority, both for the industry, and nations around the world. As food travels along the journey "from farm to fork", it will come into contact with other materials. Whether a storage container, food preparation surface, packaging, process machinery, right through to kitchen utensils and tableware. Anything that food comes into contact with is termed a "food contact material", and these FCMs may be altered by encountering food.

If a Food Contact Material is affected, there is the possibility it will transfer unwanted constituents into the food as a result, something called "migration of substances." Given very few FCMs are totally inert, under all potential conditions, this poses issues for food safety (if consumed in large quantities) and for food quality (e.g. if they alter the colour, flavour, or smell of the food).

To prevent this happening, these risks led to FCMs being covered by regulations to reduce any potential hazards to health. Originally, this was enforced by individual countries, but standardised regulations also go back almost 50 years.

That is why food contact materials are controlled and regulated, and the legislation places a responsibility on the manufacturers of FCMs, and those who supply them to industry, to follow its requirements.



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# FCM Regulations: the big three

Usually, the first things that spring to mind when thinking of “food contact materials” are the many options for holding and keeping a food or drink product once it’s been made. Jars, cans, wrappers, foil bags, sachets, bottles, plastic trays, and so on. Whatever choice the food producer makes, and for whatever reason (shelf-life, transportability, image, marketing, etc.), the FCM involved must not interfere with the integrity of the product, or endanger consumer health.

There is nothing new or surprising about the legislation that surrounds food contact materials. It is, though, constantly evolving, being assessed, and revised wherever it’s found around the world.

In fact, there is a striking level of harmonisation within FCM regulations. This is to be expected, if you consider that anything that could affect an FCM in one country will likely have the same impact in another.

That’s why the FCM legislation in force in the European Union, the USA, and the People’s Republic of China, taken together, are widely regarded as the benchmark for setting the standards for acceptable Food contact materials.

The impact of triple compliance across these three sets of rules is enormous. In 2023, the number of people living in these territories was 2.2 billion people, or 27.5% of the world’s total population. The conditions laid down by the FCM legislation also apply to food imports and exports too, extending their impact even further.

Each regulation has its own nuances, but they share a common purpose - to ensure nothing in the food chain will endanger health or interfere with the characteristics of the product.

The logos - glass and fork for EC 1935, spoon and chopsticks for GB 4806.1 - are not obligatory, so some FCMs display them, but not everything needs to. The critical element to demonstrate they are safe is the Declaration of Compliance (DoC), proving the FCM has undergone a strict set of tests and has full traceability throughout its supply chain.

In Europe, Regulation EC 1935/2004 is the current legislation dealing with Food contact materials. The key principle behind it is strikingly similar to those in effect in the US and China:

*“...that any material or article **intended to come into contact directly or indirectly with food** must be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition of the food or a deterioration in its organoleptic properties.” (our emphasis)*

# LF C M

A new supporting control was also adopted in 2004: EC 2023/2006, which focuses on good manufacturing practice for materials and articles intended to come into contact with food. These work together to form the framework that prescribes what is allowed as a FCM.

Additionally, there are usually requirements that specify the tests needed to achieve compliance for each set of regulations.



U.S. Food & Drug Administration Code of Federal Regulations (CFR) Title 21



Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food



General Safety Requirements for Food-Contact Materials and Articles (GB 4806.1-2016)

# Why is steam a Food Contact Material?

Wherever steam is used by the food and beverage industry, we have a track record of focusing on its production, efficient distribution, and point of use. Making sure steam is of the correct quality and purity, for its intended use, is a key commitment we make to our customers.

Should steam come into direct contact with food, or food come into contact with items that have been exposed to steam (termed indirect contact), then our position has always been that clean steam is the ideal standard. That's why our Clean Steam Generators (CSG) for the F&B industry are used by leading companies in the sector. This effectively will eliminate any risk with the steam itself.

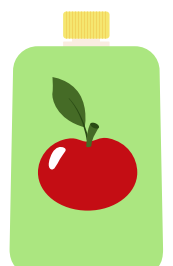
If you can have complete confidence that your steam is of ideal quality, how do you reach that same level of assurance throughout the entire steam system?

Now we have valves and vents, steam traps and strainers, probes, flow meters, and a host of other factors that need to be included.

If you can have complete confidence that your steam is of ideal quality, how do you reach that same level of assurance throughout the steam system?

This is something both our food and beverage industry customers, and the OEMs that supply them, have been looking to us to answer. It's beyond doubt that clean steam is the reliable choice for any application that directly puts steam into contact with food or drink at any stage in its production. So why can't we go one step further, supplying that quality assurance throughout the system?

The challenge was to ensure that at every point in the journey from generation to point of use, nothing could affect the integrity of steam.





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*If it is possible to have complete confidence in the quality of your steam, how do you reach a similar level of assurance for the elements that take it to the point where it is used?*

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# Closing the circle for steam in F&B

As an industry, the food and beverage sector has to deal with many competing pressures. It's one that demands the best from its suppliers, and frequently goes beyond the bare minimum when it comes to following legislative requirements. Reputation, safety, minimising risk, and enhancing trustworthiness all help companies stand out from the competition and improve market penetration.

For our part, we recognised our duty as a supplier of steam system components to make them FCM-compliant. We promote steam as the ideal choice for so many food and drink processes, we can provide solutions to guarantee it is of the highest standard, so the next logical step is to extend that certainty to the complete operation.

The duty for compliance with FCM legislation is with the manufacturer, and any OEM supplying the food and beverage industry. However, the industry itself also has obligations. In Europe, for example, EC 852/2004, surrounding the "hygiene of foodstuffs" could not be clearer:

*"Steam used directly in contact with food is not to contain any substance that presents a hazard to health or is likely to contaminate the food."*

The US has its own set of requirements for what is and is not allowed in boiler water, found in Code of Federal Regulations Title 21 (21CFR173.310).

In the many cases where steam is directly injected into foods, only FCM-compliant equipment should be used. Provided every other element in the steam system is similarly compliant, it will eliminate risk, and highlight a commitment to best practice.

That best practice, and the industry's tendency to go beyond the bare minimum of what's required, extends beyond direct contact steam. For many of our OEMs, and some global F&B producers, indirect contact steam should also be counted as a Food Contact Material. Some examples of these are listed in the box below.

**Food Contact Materials applications –  
e.g. EC1935 applies.**



## Direct Contact (FCM)

Steam in contact with the food product

Direct product Sterilisation – e.g UHT milk (Dairy), Soft drinks

Cooking – steam infusion and steam injection into Soups, Sauces, Ready meals, Rice, Fish, Shellfish

Steam conditioning – Couscous, Porridge Oats, Pasta, Noodles, Chips, Bread proving

Skinning, Peeling, Blanching – Steam sparging to process Vegetables and Fruit

Curing, de-feathering, defrosting - Steam sparging for fish/meat processing

Extrusion and Extraction – Breakfast cereal, animal feed, coffee



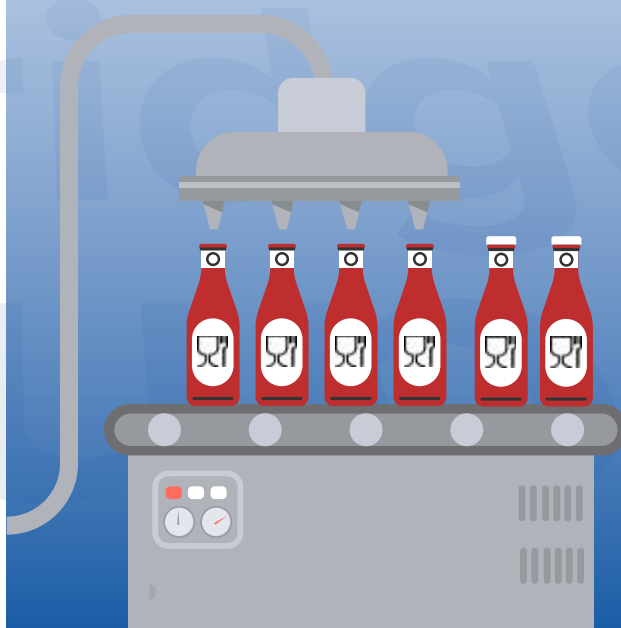
## Indirect Contact (FCM)

Steam in contact with food surfaces

Steam in contact with the inside of food packaging

Sterilisation & SIP (Sterilise In Place) – for process equipment/product lines/containers, purging CIP lines

Packaging sealing – steam blown over caps, jars, bottles, jars (pulling a vacuum)



# Fulfilling Steam's Potential: introducing Food+

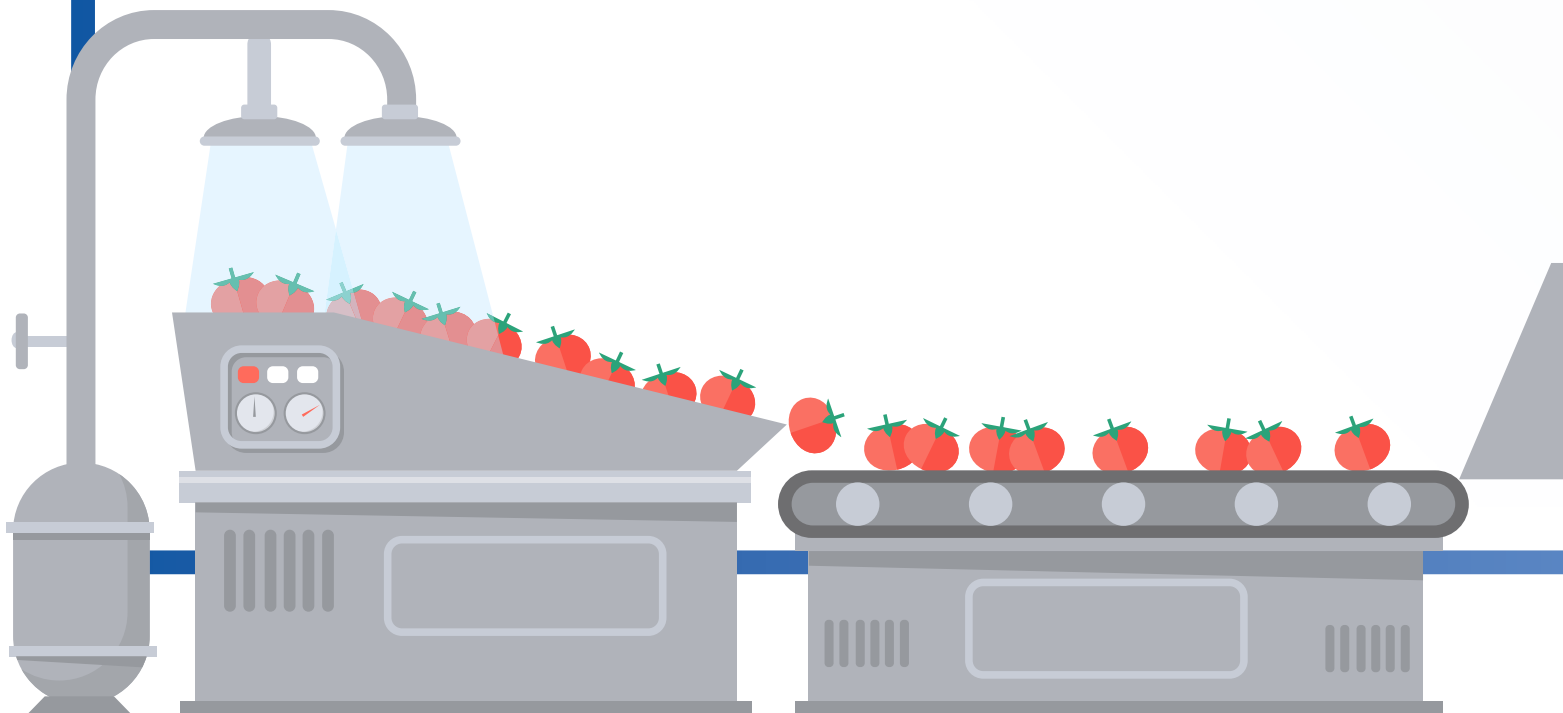
Recognising our responsibility as a manufacturer to ensure FCM-compliance was only the start of the journey. The sheer number of applications for steam in the industry is daunting, with a broad range of components being used. These had to be individually assessed before they could be considered legitimate Food contact materials.

This process, taking several years, involved a complex investigation of every product, resulting in 100% traceability from the point of origin, through to the production phase, and ending with the final packaging before release.

Every part has been subjected to stringent third-party testing by a global leader in the field, operating 1,000 testing laboratories worldwide. These included rigorous migration and organoleptic trials, under extreme conditions, meeting or exceeding any relevant legislation.

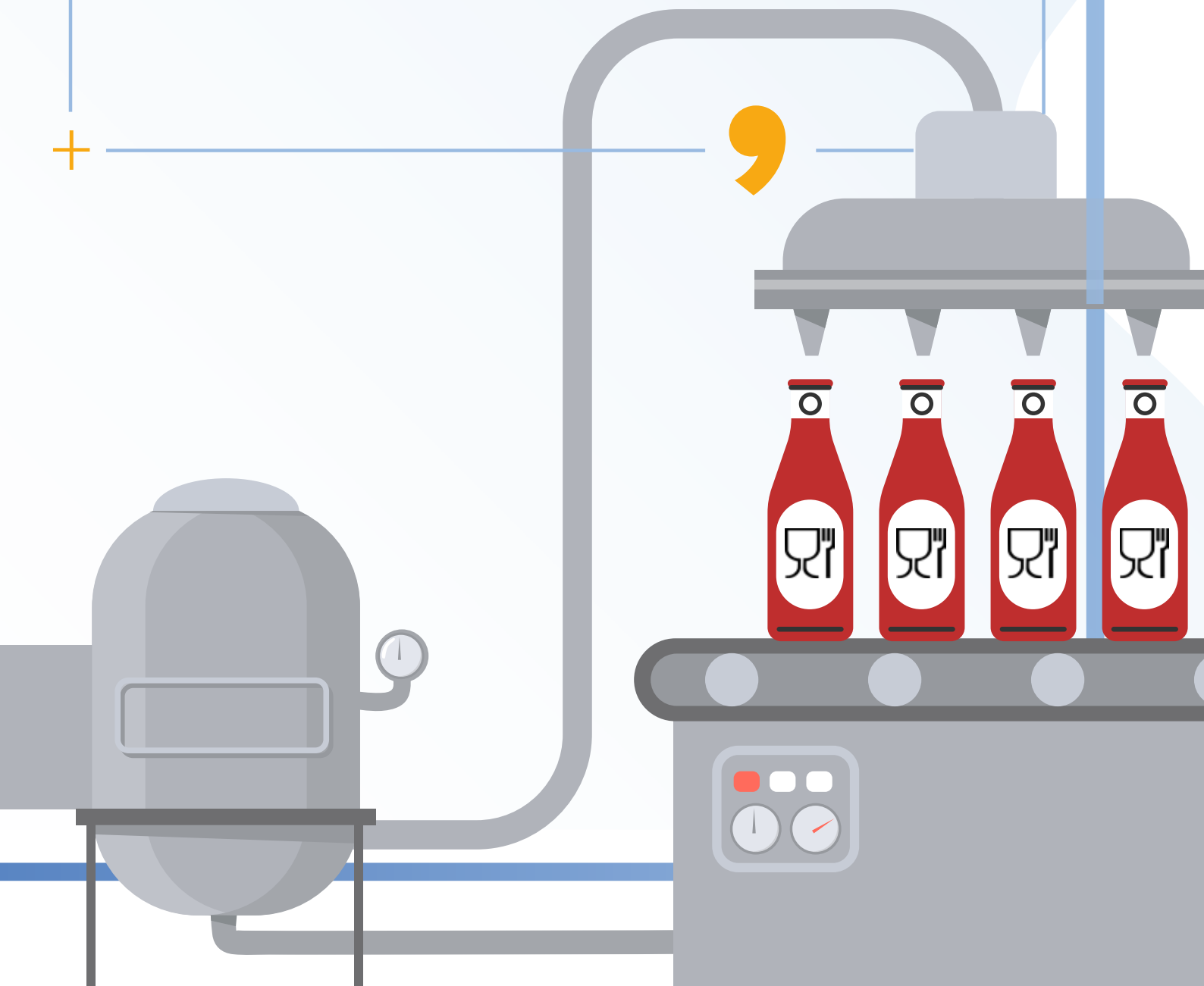
The result is Food+, a global first for Food and Beverage steam systems. Setting the standard for food contact materials in steam systems, now every element will confirm it is fit-for-purpose, supported by an official Declaration of Compliance.

Exceeding mandatory requirements is exactly what our customers have been asking us to do. Food+ delivers a new level of best practice, both for the F&B and OEM sectors.

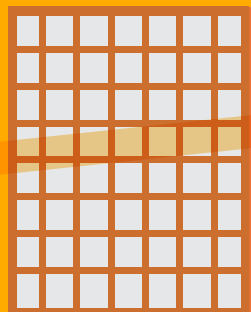


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*Setting the standard for food contact materials in steam, now every system element can prove it is fit-for-purpose, with an official Declaration of Compliance accompanying it.*



# How Food+ will help your business



Now we have arrived at a new level of compliance for steam in the industry, the question is how best to take advantage of your unique situation. And, given the tremendous diversity steam's uses within the sector, that will depend on how compliant you wish to be.

Precisely how you use steam will be critical in determining the role Food+ will come to play in your system. It presents a global opportunity to adopt industry-recognised equipment that, for the first time, meets FCM rules.

Choosing Food+ will demonstrate a commitment to following best practices for manufacturing in the food and drink industry. Using Food+ for your business will reduce the potential points of contamination in your system, ultimately helping prove that you're operating the best system possible.

You will not find Food+ components drastically different mechanically; the principles behind their workings are the same. However, they now have improved traceability, throughout the manufacturing process, and have undergone stringent testing, reaching a new level of security in their compliance with FCM legislation.

Food+ offers the food and beverage industry, and its suppliers, a turning point in validating the safety of their steam systems. For an industry that is renowned for being risk-averse, the question is not "why now", but more "why wouldn't you?".



# Taking the next steps with Food+

At Spirax Sarco we have a clear purpose: to engineer a more efficient, safer, and sustainable world. Food+ will play a pivotal role in enabling the food and beverage industry to focus on other pressing priorities.

You will have your own Hazard Analysis and Critical Control Point (HACCP) procedures already in place. This is something we can help with when it comes to assessing your steam system, and how it is used. Given its crucial role in your processes, bringing in expertise with steam reduces your risk, leaving nothing to chance.

Once we gain a complete understanding of your unique circumstances, we can work with you towards improving your steam system's compliance.

If you are an OEM supplying the industry, then your duty is the same as ours; to only supply FCM-compliant equipment where it is in direct contact with food or drink. Talk to us to see how we can elevate your F&B-focused offering.

Find out more at [www.spiraxsarco.com](http://www.spiraxsarco.com)

## SOURCES/FURTHER INFORMATION

[www.legislation.gov.uk/eur/2004/1935/data.pdf](http://www.legislation.gov.uk/eur/2004/1935/data.pdf)

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R1935&rid=1>

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=173.310>

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