

Odor Elimination technologies for refrigerators

A Chinese multinational company is looking for a high-efficiency odor elimination technology that could keep the air inside the refrigerator fresh without undesirable odors, and avoid cross-odor contamination of food.

Key Success Criteria:

We are now seeking for highly efficient odor elimination technologies or integrated solutions to remove the two major sources for undesirable odors, so as to solve 2 key issues:

1. To eliminate undesirable odors when the door is open;
2. To avoid cross-odor contamination of the food while the door is closed, so different food items don't absorb the smells of surrounding food.

The major sources of undesirable odors include:

- Natural odors of food: Allium plant odor (sulphide), fish odor (trimethylamine), durian odor (ester, ketones, and sulphide);
- Food spoilage: bacteria metabolism (methane, sulphide, methyl mercaptan, and methyl amine).

We are looking for solutions that deal with those smells and achieve these criteria:

- Odor elimination efficiency: The elimination efficiency should exceed 90%.
 - It should be safe and reliable to use in the refrigerator, and not include harmful substances (ozone, radiation, and UV should meet the national standard).
 - No secondary pollution is produced.
 - Its lifetime should be no less than 10 years (preferential but not necessary), and no specific maintenance is required.
 - Cost:
 - Odor elimination module: $\leq 20\text{RMB}$;
 - Total solution (which includes the module and its integration with fridge structure and circuitry if necessary): $\leq 50\text{RMB}$.
 - Must work in the refrigerator operation environment:
 - Humidity: 40%-90%
 - Temperature: $-18\sim 10^{\circ}\text{C}$
 - Volume: 200~500L
 - Power supply: 5/12V, DC
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Background:

Food spoilage usually occurs when users forget to consume the food stored in the refrigerator on time or sometimes they do not use the refrigerator for a long time. The undesirable odor of the spoiled food could cause negative impact on user experiences;

Meanwhile, food stored in the refrigerator usually includes a wide range of food types. Sometimes, the odor of some specific food (for example durian, a very popular Chinese fruit with a very strong smell) may fill up the space of the drawer or the whole cabinet, and then this kind of odor will mix up with odors of other food, which could lead to quite unpleasant user experiences.

Possible Approaches

Possible approaches could be based on

- Long-acting and renewable physical odor absorption technologies (the renewable process does not require manual operations). May or may not require electricity.
- Chemical absorption technologies (spectrum characteristics of undesirable odors; the absorption capability should be strong)
- Highly effective and complete oxidation elimination technology (no secondary pollution)
- Integrated solutions
- Other new and fast odor elimination technologies

Approaches Not of Interest:

The following technologies or approaches are not of interest:

- Ordinary physical absorption technologies (ordinary activated carbon/molecular sieve, etc.)
 - Ordinary oxidative decomposition (ozone, plasma, and UV sterilization technologies)
 - Technologies that require high concentration of ozone
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Preferred Collaboration Type:

Our multinational partner company prefers to work with partners that have existing technologies or approaches that can be applied to this specific application. Collaboration can involve technology licensing, product sourcing, proof of concept leading to joint development agreements and assistance with scale-up to manufacturing. Preference will be given to technologies or approaches that currently have working prototypes that can undergo feasibility, validation or proof of concept over a 3-6 month period. Financial support for the proof of concept phase will be negotiated based on specific performance targets agreed between both parties. For selected collaborators our partner company may provide access to samples, test equipment and testing facilities. Technologies will need to satisfy manufacturability, material cost and ease of use assessments to progress from the concept stage.

How to Respond:

We are looking for concise non-confidential proposals, statements of expertise or other enquiries if your expertise fits our needs. Please note that only non-confidential information can be accepted. The proposal should also provide us with appropriate contact information in order to help us keep update with solution providers. For all responses please indicate your preferred collaboration approach (eg supply, joint development, research) and capabilities (eg research, concepts, prototype, small scale manufacture, large scale manufacture).

If you are interested, please respond to:

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