

# Cold chain monitoring\*



\* Without Blockchain and IoT



A passive star-shaped sensor, made of salted ice  
Salt is regulating the melting temperature of the star from  $-21^{\circ}\text{C}$  to  $0^{\circ}\text{C}$   
It can be produced at any frozen food factory, while chemical indicators  
should be shipped and costs almost nothing





Once melted inside the package, it is impossible to recreate the star form without breaking the package seal

A visual indicator which could be easily checked by any customer before purchasing and without needing to open the package



The star sensor does not affect recipe of the product: salt and water are common ingredients of any food



The star sensor can be accounted for in the weight of the packaging, so no losses for the food manufacturer

“Check before you buy” labelling is a good differentiator for the benefit of the manufacturer, the retailer and the end customer







Is this salad fresh?

Vitaly Kleban, [kleban@ieee.org](mailto:kleban@ieee.org), Espoo, Finland