

# Near and Mid IR Optical Filters For Quality Control & Differentiation

## Some Facts about Vortex

- Based in Hinckley UK, started 2009
- Independently owned, state of the art technology
- High Quality IR filters are a growing business
- EPIC member for 7 years.



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## Food Industry Detection in the IR

- Fats, proteins, water
- Adulterated/contaminated foods
- Ripeness of crops/fruit
- Farming, Diseases and Early Pest detection in crops
- Farming efficiency, e.g. Reduce Fertiliser use.
- Others...it grows by the month.

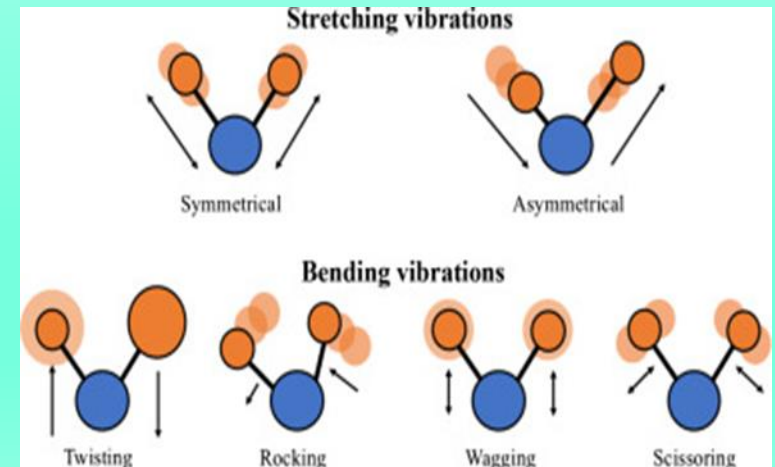
Any material where there are differences in  
reflection/transmission

# Near and Mid IR Optical Filters For Quality Control & Differentiation

## What the filter actually does ?

It highlights a 'fingerprint' for the material.

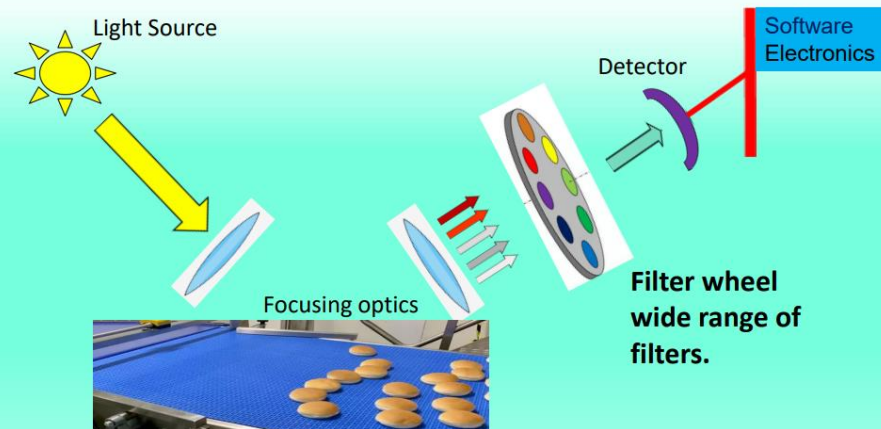
- Many materials have IR absorption
- Lots of signal...aiming to hit a big target



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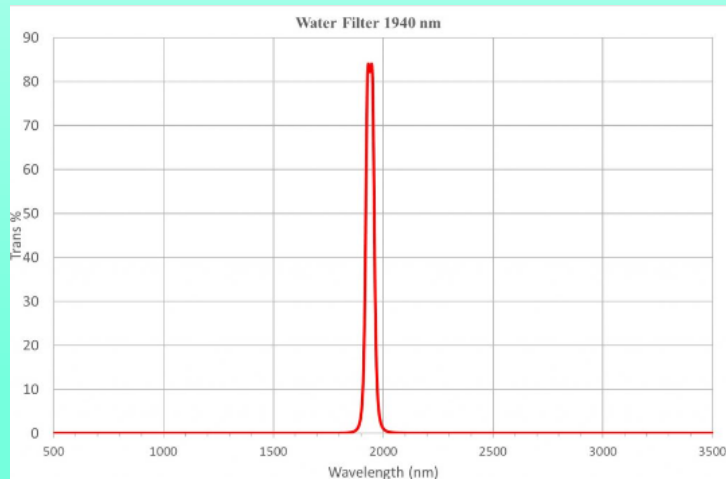
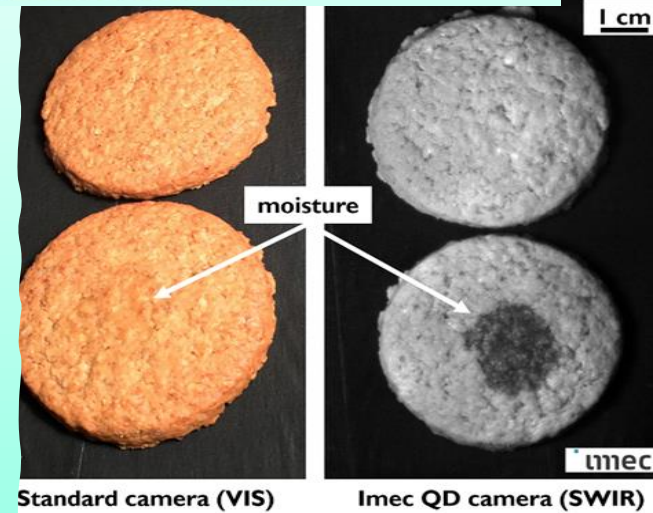
## In Line Monitoring with Narrow Band Filters

Filter wheel Instrument with NBP and VNBP

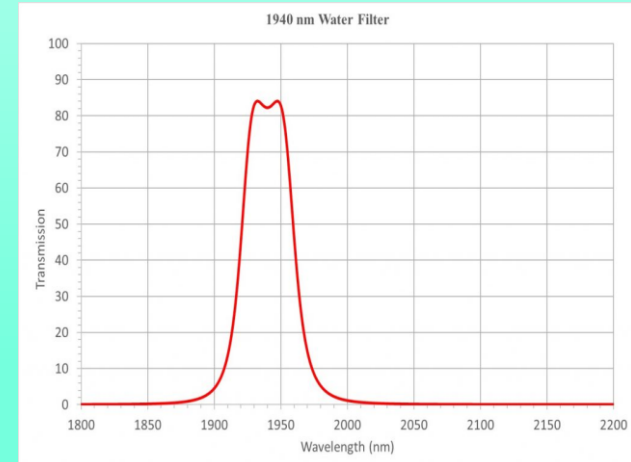


‘Shelf Life/Best Before’ evaluation

Water/moisture detection.



Wide band performance



Close up view

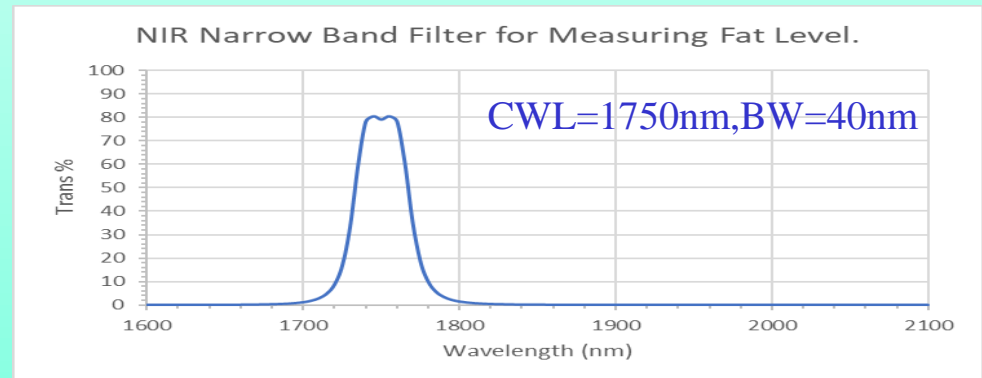
‘Water Content Filter’ (1940 nm)



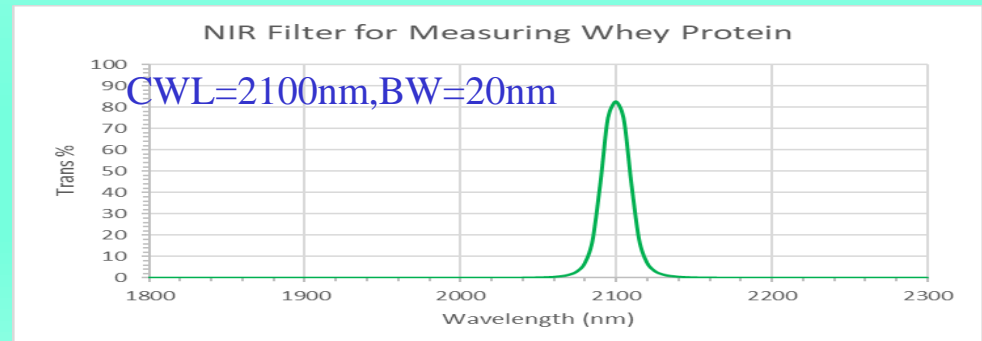
## Measurement of Fat Level.



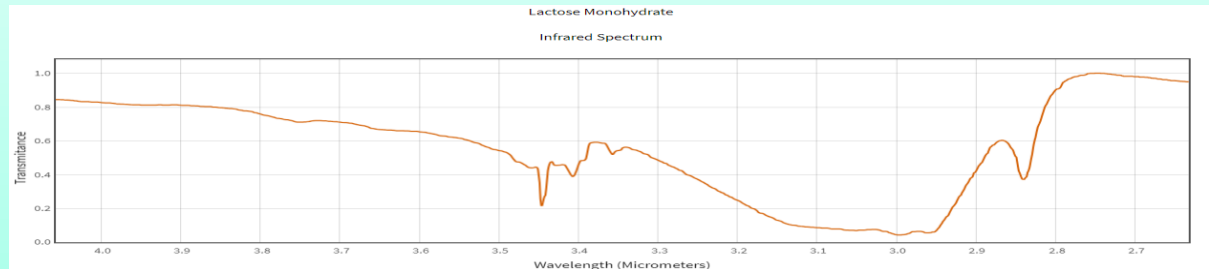
‘Fat Content’ Filter (1750 nm)



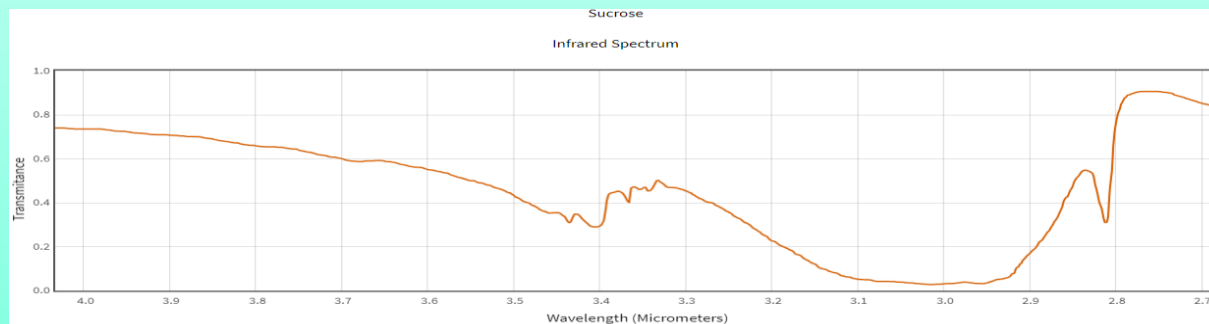
Other example... Whey  
Production  
(bi product of making cheese.)  
Measurement at 2100 nm



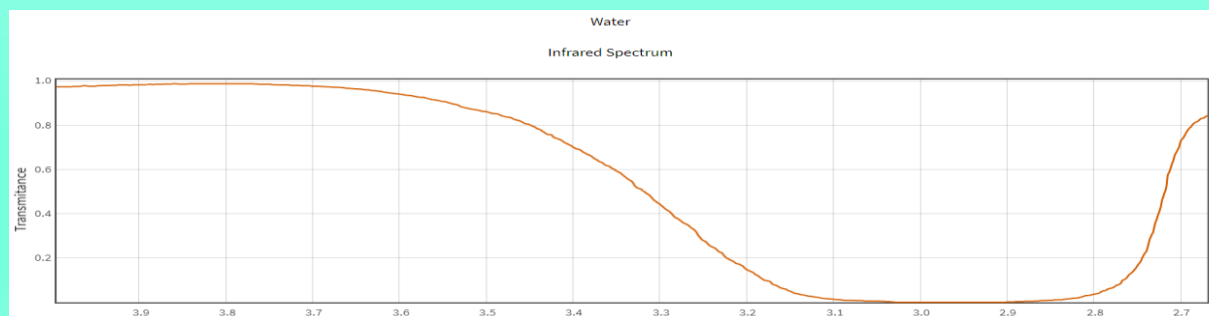
## Differentiation, can be complex.....Lactose



Highlights some important considerations

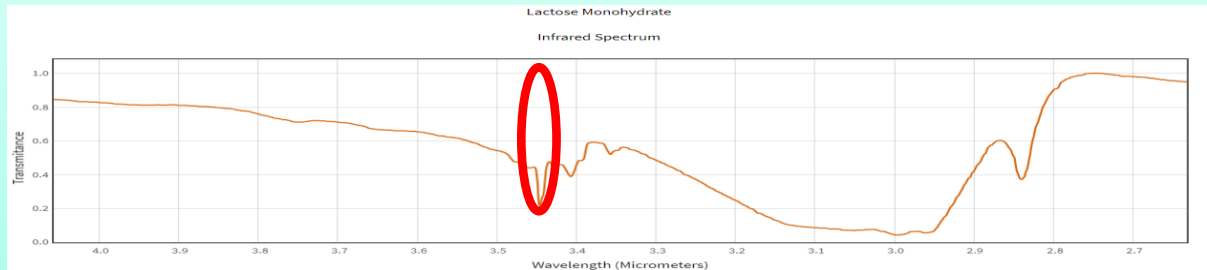


Avoiding similar compounds that may be present (sucrose v lactose)

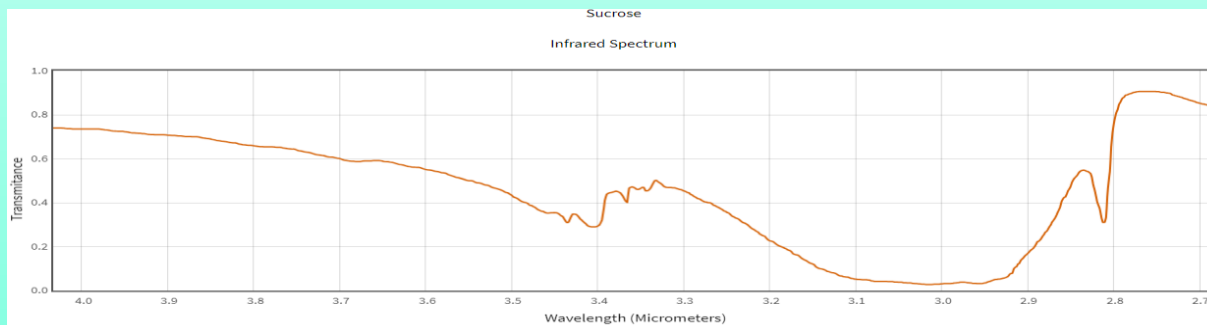


Avoiding water band

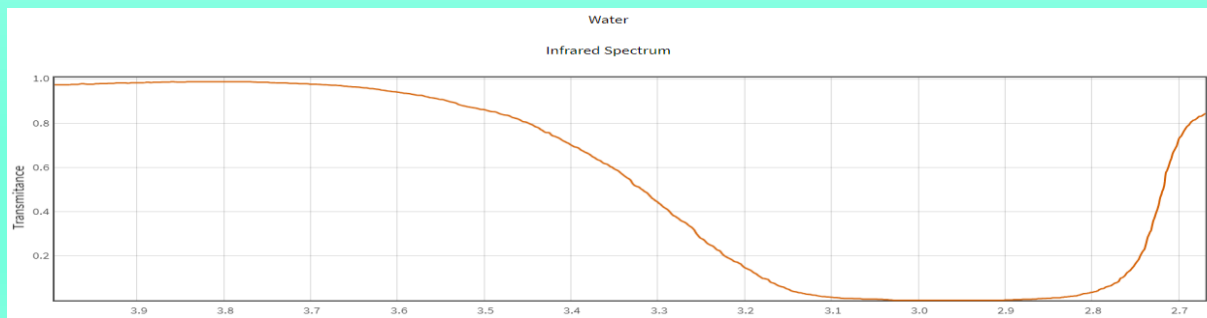
## Careful analysis of IR Spectrum.....Lactose



Highlights some important considerations



Avoiding similar compounds that may be present (sucrose v lactose)

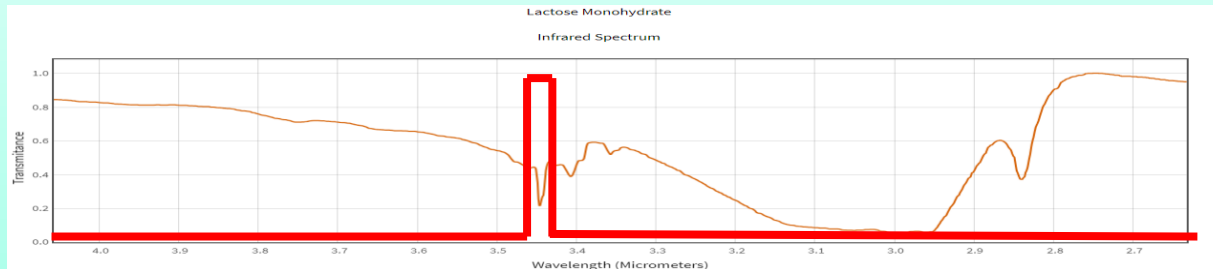


Avoiding water band

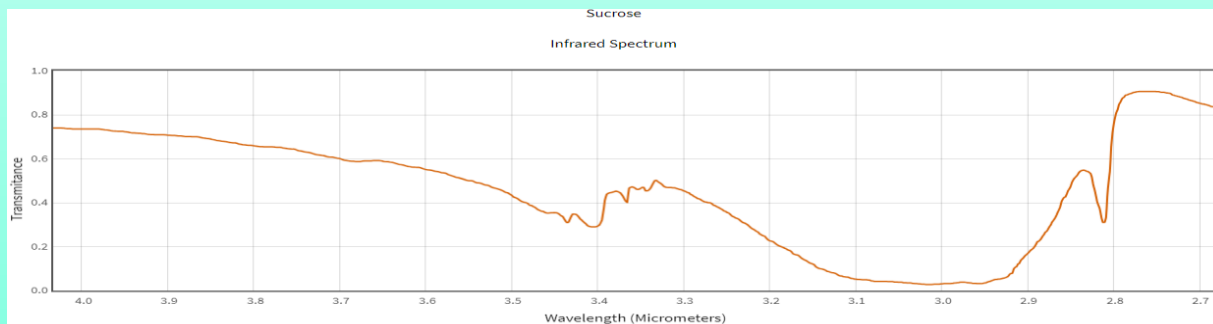


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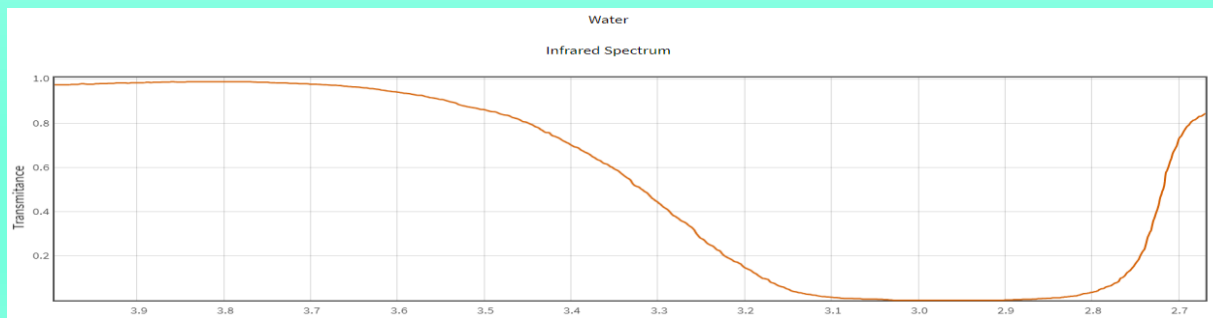
Suitable filter design.....manufacturable in volume.



Highlights some important considerations



Avoiding similar compounds that may be present (sucrose v lactose)



Avoiding water band

Some cases 2 or 3 very narrow filters may be needed !



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## The Epic Questions!

- What we can do for you.....

Work with you to make your detection dreams a reality! Particularly the newer challenges!

What the community can do for us

....lower cost detectors please for 1-5um would be a game changer, put it in a phone!



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**Thank you for your attention!**

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