

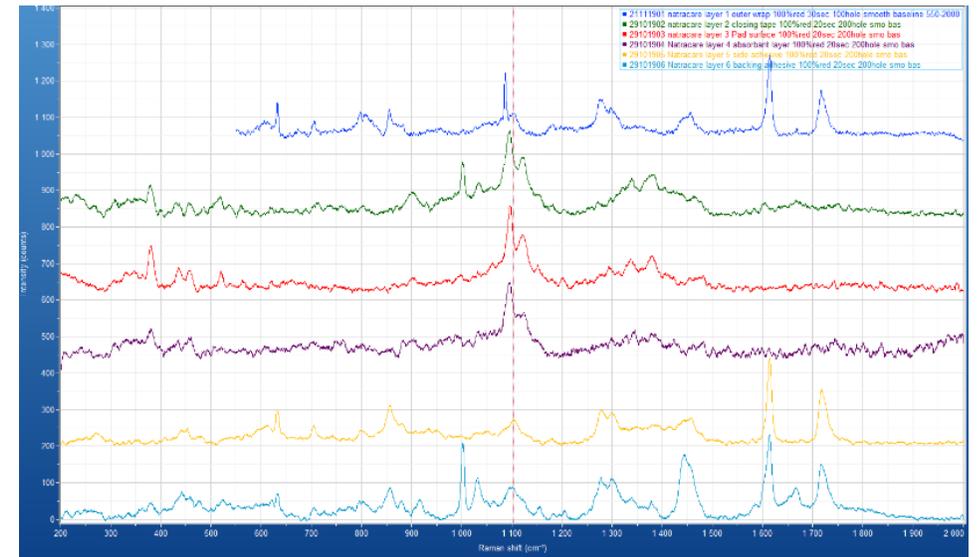
# Analysis of Results

- Raman spectra were processed by Horiba Lab6 Raman software and then the spectra compared to a database of known substances to identify the material.
- KnowItAll database contains a large number of polymers and other materials, including chemicals, minerals and dyes.
- A confidence level of at least 80% indicated a very good match to the database spectra and a reasonable likelihood that the material was present in the sample.

Substance	Properties	Uses
Cellulose	natural fibre	clothing, paper
Poly butyl terephthalate (PBT)	thermoplastic polymer	medical applications
Polyethylene (PE)	thermoplastic polymer	common plastic e.g. bags, films, bottles
Poly ethylene terephthalate (PET)	thermoplastic polymer	common plastic e.g. fibres, containers and resins
Polypropylene (PP)	thermoplastic polymer	common plastic e.g. packaging and labelling
Poly (propylene acrylic acid)	thermoplastic polymer	acrylic acid enhances bonding of PP layers
Poly vinyl acetate (PVAc)	thermoplastic polymer	water based adhesive.
Styrene/butadiene block copolymer	thermoplastic elastomers	rubberising and adhesives.
Styrene/isoprene block copolymer	thermoplastic elastomers	rubberising and adhesives.
Polyester elastomers	thermoplastic elastomers	rubberising and adhesives.
Ethylene vinyl acetate (EVA)	thermoplastic elastomers	foam rubber, waterproofing and adhesives.
Vinyl acetate copolymer	thermoplastic elastomers	foam rubber, waterproofing and adhesives.
Styrene Ethylene Butylene Styrene (SEBS)	thermoplastic elastomers	rubberiser, eco-friendly substitute for PVC
Polyacrylamide	polymer gel	thickener, superabsorbent hydrogel
Polyurethane	thermoset polymer	highly porous foam, absorbent sponges
Titanium oxide	white pigment	colouring material, increase opacity
Calcium stearate	white waxy powder	surfactant, lubricant and food additive
Calcium carbonate	white powder	added as a filler to plastics
Navy blue dye	pigment	colouring material
Light blue dye	pigment	colouring material
Violet dye	pigment	colouring material

# Sample 2 – Natracare Ultra

Layer	Components	% Match
Outer Wrap	Polybutyl terephthalate, Calcium carbonate	87.5
Peel-off tape	Cellulose, styrene/butadiene copolymer	84.1
Pad Surface	Cellulose	92.7
Absorbant Pad	Cellulose	83.1
Backing Layer	Cellulose	78.6
Edge Adhesive area	Polybutyl terephthalate Poly Vinyl Acetate	89.9
Back Adhesive area	Polybutyl terephthalate, Styrene/butadiene copolymer, Styrene Ethylene Butylene Styrene (SEBS)	81.9



# Conclusions

## 1. Organic products:

- The Natracare product was mostly composed of cellulose, with a medical grade polymer present only where adhesive and waterproofing properties were necessary.

## 2. Conventional sanitary products:

- Always, Carefree and Lillets were mostly composed of recyclable thermoplastics plastics, mostly polyethylene and polypropylene.
- Where cellulose fibres were present in the conventional products, it was used mixed together with plastic fibres. Cellulose alone (probably paper) was used only for protective closing tapes.
- In several of the products, fillers (e.g.  $\text{CaCO}_3$ ) and colourants (e.g.  $\text{TiO}_2$ ) were also present.
- A variety of thermoplastic elastomers (e.g. Ethylene vinyl acetate, styrene/butadiene and styrene/isoprene copolymers) were used for waterproofing and as adhesives.
- Tena Lady incontinence pads also contained additional water-absorbing substances such as polyacrylamide and polyurethane foam.