

WHAT IS TEXTURE ANALYSIS 6/07/07

Texture analysis was originally developed for the food industry; Manufactures required a more sophisticated and objective assessment of their products. The definition of texture and man's perception of texture required more than just Human sensory test panel as a result the food industry invested heavily into instrumental texture analysis. The science of texture analysis has been under investigation in academia for over 50 yrs.

The pharmaceutical need for sophisticated product testing for research and development, Production and quality control, has meant the industry adapting texture analysis by using specially designed attachments and software programs to analyse the quality of the raw materials, semi finished, final product and packaging.

The flexibility of texture analysis in the pharmaceutical industry has been widened considerably to include cosmetics, packaging, personal care, and medical devices. Brookfield is delighted to offer a range of texture analysers with attachments to perform tests on different products.

Tablets

Tablet crush strength:

The diametrical compression testing of tablets provides valuable information about the likely performance of a tablet, especially for controlled - release products. The tablet should be capable of breaking up readily at a controlled rate inside the body but must be strong enough to withstand packing, handling, transportation, and further process activities such as Tablet coating.

Tablet coating:



Coating formulation is of primary concern because it can have an effect on tablet performance and release of the active ingredient. The pharmaceutical industry have adopted the aqueous film coatings and moved away from the traditional organic solvent film coatings despite the fact that the former has several disadvantages including inferior adhesive properties. The use of additives to enhance tablet

properties such as colour, opacity,, glossiness etc. The additives can affect the quality of the tablet by causing peeling, edge splitting, and cracking. This can have a detrimental effect especially if the tablet has been coated with an enterorinsoluble or sustained release film. Using the Brookfield range of texture analysers it is now possible using the Brookfield range of texture analysers to quantify the adhesive properties of the coating to the tablet surface. Apart from ensuring consistent quality manufacture texture analysis can also be used to monitor the effect of changes in coating formulation and process control.

Gels:

Gels are used in various applications in pharmaceutical industry; ranging from gel capsules, wound dressing, jelly lubricants to hydrogel polymers. The quality of the gel determined through bloom strength testing provides useful information about the consistency not only of the gel but also of the final product. Other possible applications include mucoadhesion testing of the adhesion of a polymeric probe to a mucosal surface in conditions similar to those in the body.

Packaging:

Blister Packaging:



Texture analysis can be used to quantify the force required to extract the tablet from the packaging. Using specialised accessory we are able to imitate a finger pressing on the blister. With the increase in blister packs use for tablet packaging in the pharmaceutical industry it crucial that the packs are easily opened by weak patients and the elderly, but strong enough to avoid accidental opening by children. Texture analysis can be used to quantify the strength of the packaging.

Sterilized products:

The integrity of the packaging of sterile products such as adhesive plasters, Hypodermic needles, and wound dressings is of critical importance. Heat welding is usually used to seal the packaging, the seal can be compromised through the welding and cooling setting, at brookfield we have attachments that can imitate the seal being torn apart, while measuring the seal strength.

Metered dose inhaler:



As this involves self-administration its crucial that the inhaler is safe and accurate during drug delivery, Texture analysis to asses the quality and accuracy of the inhaler by using a finger probe to imitate a finger pressing down on the inhaler and measuring the force required to administer a dose.

Syringe tester:



The test rig will quantify the force required to perform extrusion and extraction of an injectable solution using a syringe. The information is important for manufacturers in optimising the quality of the syringe as well as patient comfort and safety.



Hypodermic Needles

Comparison of sharpness of hypodermic needles by penetration through a rubber stopper

Transdermal patch adhesiveness:

The use of adhesive patches for controlled release in applications such as nicotine patches, appetite suppressants, and contraceptive and hormone replacement therapy etc. The adhesiveness of the patches is critical in the drug delivery mechanism, the texture analyser can be used to quantify the force required to break probe surface and adhesive side of the patch contact by investigating into the adhesiveness of transdermal delivery patches by probing with a ball probe through a holed plate

Other possible pharmaceutical applications list using the LFRA

Compressed Face Powders

Comparison of hardness or 'cake strength' of two eye shadows

Deodorant

Comparison of hardness of two different formulations of deodorants by penetration with a 2 mm cylinder probe

Gel Capsules

Comparison of rupture force and elasticity of four gel capsule types by penetration with a 2 mm cylinder probe

Hair Gel

Comparison of consistencies of two types of hair gel by back extrusion

Lipstick



- Comparison of hardness of two different lipstick batches by penetration with a 2 mm needle probe - according to ASTM Standard method D 1321-95
- Comparison of bending force of lipsticks at 2 storage temperatures using a Cantilever Test



- Comparison of hardness of two different lipstick batches by penetration with a 2 mm needle probe- an adaptation of ASTM Standard method D 1321-95

Medical Adhesive Tape

Comparison of adhesiveness of medical adhesive tapes by testing with a ball probe through a multi-hole indexing system

Moisturising Cream

Comparison of consistencies of three moisturising creams by back extrusion

Petroleum Jelly



Spreadability/Softness of petroleum jelly stored at 5°C and 25°C

Shampoo

Comparison of consistencies of two shampoos by back extrusion



Soap

Comparison of hardness of two different types of soap bars by penetration with a 2 mm probe

Toothpaste



Comparison of toothpaste firmness / 'force to extrude' of two toothpaste Formulations

Wax

- Comparison of hardness of two wax types by penetration with a cone probe - according to ASTM Standard method D937-92
- Comparison of stickiness properties of two types of soft moulding hair wax using a 1" ball probe
- Measurement of the stickiness properties of hair removal wax with a spherical probe