THE POWER OF TACTILITY: TIPPING PAPER IN INTERACTION WITH THE CONSUMER

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SUMMARY

In the present study, Super Lip-Release and Textured Tipping are confirmed to generate extraordinary tactile interactions between filter cigarettes and consumers.

With the application of a special, highly water-repellent lip-release varnish, Super Lip-Release Tipping creates a remarkably comfortable sensation on the human lips. The superior hydrophobic effect of this Tipping is quantitatively demonstrated with a physical simulation model and a survey amongst regular cigarette smokers.

Textured Tipping, which is based on a mechanical embossing process, is able to stimulate the tactile senses on the lips and fingers in a pleasant way. The haptic surface structure can be perfectly combined with specific print designs in order to provoke visually induced tactility, to upgrade the optical appearance of cigarettes and to suggest options for smart security features.

The benefits above show that Super Lip-Release and Textured Tipping represent a powerful fusion of technical functionality, appealing design features and exceptional tactile impressions.

OBJECTIVES

- Simulation of the liquid absorption by Tipping Paper with an empirical mathematical model
- Quantitative comparison of the subjective stickiness perception of Super Lip-Release and standard Tipping on the lips with the model and a survey amongst regular cigarette smokers
- Introduction of Textured Tipping as excellent option to interact with the consumer on a tactile or haptic basis

TIPPING PAPER...

... is the only part of the cigarette which is in direct contact with the human lips of smokers
... is the first item the consumer sees and touches after opening the cigarette pack
... can still be seen and touched by the consumer after smoking
... is the perfect communication tool via tactile or haptic surface features

SIMULATION

Standard Tipping:  
Super Lip-Release Tipping:

(1) – primary absorptivity – lip-release efficiency

For cigarettes with reduced stickiness and superior tactile effects

LIP-RELEASE EFFECT

Definition: The release of contact between the human lips and the Tipping Paper \rightarrow comfortable tactile sensation during smoking

Absorption of liquids (saliva):
- Lip-release barrier: Primary absorptivity = lip-release efficiency
- Secondary absorptivity = absorption speed

STATIC CONTACT ANGLE

Standard Tipping:  
Super Lip-Release Tipping:

4 µl droplet
5 seconds after droplet deposition

Lip or haptic basis

Concrete perception of the lip-release effect is subjective and depends on smoking habits \rightarrow Survey amongst regular cigarette smokers:

- Cigarettes with non-release, standard and Super Lip-Release Tipping
- Evaluation of the stickiness of the Tipping on the lips with numbers from 0 to 10 (0... no adhesion, 10... extreme adhesion & painful release)

TEXTURED TIPPING

Super Lip-Release Tipping: Smooth, gentle and pleasant feeling on the lips

FEATURES

Combination of embossing with specific print or hotfoil designs:
- 3D effects
- Impression of touching textiles or natural materials

Superior hydrophobicity & adjustable lip-release strength

Super Lip-Release Tipping: Smooth, gentle and pleasant feeling on the lips

SMOKING SENSATION

The physiological perception of the lip-release effect is subjective and depends on smoking habits \rightarrow Survey amongst regular cigarette smokers:

- Cigarettes with non-release, standard and Super Lip-Release Tipping
- Evaluation of the stickiness of the Tipping on the lips with numbers from 0 to 10 (0... no adhesion, 10... extreme adhesion & painful release)

SURVEY RESULTS

Good correlation between the simulation results and the lip-release sensation
Stickiness of the uncoated paper too high

Introduction of Textured Tipping as excellent option to interact with the consumer on a tactile or haptic basis

ABSORPTION MODEL

Dynamic contact angle:

\[ \alpha = \frac{c_1}{1 + \frac{c_2}{T - c_3}} \]

- \( c_1 \): Surface tension of water
- \( c_2 \): Mass density of the lip-release solution
- \( c_3 \): Base paper thickness

Smoother embossing, higher release efficiency

STANDARD TIPPING

Definition: Tipping materials with mechanically embossed haptic surface structures

No extra chemical treatment of the Tipping \rightarrow no conflicts with tobacco regulations

Implementation as security feature for anti-counterfeit activities

FEATURES

Combination of embossing with specific print or hotfoil designs:
- 3D effects
- Impression of touching textiles or natural materials

Textured Tipping provokes a pleasant feeling on smokers’ lips