

Global Sensory

Date of report: 01/07/2020

**Project: Project Swift – UK****Market: UK****Segment: Low Tar | Full Flavour**

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## Background

In the UK market the derogation for characterising menthol flavours has ended on 20<sup>th</sup> May 2020 due to EUTPD regulations. Characterising flavours are those that have a clearly noticeable smell or taste other than tobacco before and during consumption.

JTI recently introduced a new version of Mayfair Green and Sterling Superkings Green – each version with ‘new’ as descriptor in the brand name and Mayfair in King Size (KS), Sterling in Superking Size format (SKS). Although characterising flavours in the blend/cigarette are prohibited, a menthol impression while and after smoking has been reported.

This project is part of the broader ‘Swift’ project as the same was observed in various markets: Portugal, France, Italy, Slovenia and BeNeLux amongst others.

Research questions in scope:

- Are there significant differences between post- and pre-EUTPD version?
- What are the main sensorial differences between these versions, with focus on smell, taste and smoking experience?
- Could a smell or taste of menthol or other flavour distinct from tobacco be detected?

Please note that

- pre-EUTPD versions of Mayfair New Green and Sterling Superkings New Green were no longer available in the UK market therefore post-EUTPD versions could not be compared with pre-EUTPD ones.
- Sterling Dual Superkings Capsule pre-EUTPD was therefore compared with the New Green post-EUTPD versions.
- the capsule of Sterling Dual Superkings Capsule (pre-EUTPD) was crushed just before starting the product evaluation as the smoking experience with crushed ball was of particular interest. From previous evaluations we do know that the aroma of the crushed capsule only migrates after a few minutes, thus smell before smoking of the crushball versions reflects the smell of the cigarette rather than the crushball flavour.

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- only Sterling New Superkings Green post-EUTPD and Sterling Dual Superkings Capsule (pre-EUTPD) are in Superking Size format and thus comparable. Mayfair New Green is in King Size format.

## Conclusion

Both post-EUTPD versions show a completely different smell profile compared to Sterling Dual Superkings Capsule (pre-EUTPD). The post-EUTPD products are not described by any tobacco related smell attributes such as 'hay like' representing Virginia tobaccos – a descriptor for the pre-EUTPD version. Post-EUTPD versions are clearly described by fruity, sourish, alcohol and citrus/tropical like notes in smell.

Also taste wise a fruity impression is noticeable; furthermore both post-EUTPD products are described by a **menthol taste** impression and evoke a **cooling effect** – even though less intense compared to Sterling Dual Superkings Capsule (pre-EUTPD).

'Cooling effect' and 'menthol taste' are clearly noticeable for post-EUTPD versions which is also confirmed by measured laboratory data (menthol in cigarette and menthol in smoke).

## Versions

Version	Mayfair New Green (post-EUTPD)	Sterling New Superkings Green (post-EUTPD)	Sterling Dual Superkings Capsule (pre-EUTPD)
Brand	Mayfair	Sterling	Sterling
Country of Sale	UK (as of May 2020)	UK (as of May 2020)	UK (before May 2020)
Analysis No. (Lab)	295929	295928	295660   295668
Format	KS	SKS	SKS
T/N/CO (crushed in case of CB)	5.4 / 0.51 / 6.1	6.8 / 0.65 / 7.4	8.9 / 0.77 / 8.3
Menthol in Filter [mg/filter]	0.40	0.44	n / a
Menthol in Tobacco Rod [mg/tobacco rod]	0.92	1.09	n / a
Menthol in Cigarette [mg/cig]	1.32	1.53	0.626
Menthol in Crushball [mg/ball]	n / a	n / a	3.16
Menthol in Smoke [mg/cig]	0.105	0.129	0.63
Rod Weight [mg]	653.9	762.5	842.1
Filter	Mono Filter (white tipping paper)	Mono Filter (white tipping paper)	Mono Filter (white tipping paper)
Cigarette Paper	MV	MV	MV
Filter Ventilation [%]	55.6	50.4	50.3
Puff Number (crushed in case of CB)	6.7	8.3	8.4
DP Index	19483	19484	19457
Series	D5490	D5490	D5485

## Report

### **Differences Mayfair New Green (post-EUTPD) vs. Sterling New Superkings Green (post-EUTPD) vs. Sterling Dual Superkings Capsule (pre-EUTPD)**

The versions are sensory wise distinguishable.

There are no differences in optics before and during smoking.

#### Feel/touch before smoking

Mayfair New Green (post-EUTPD) and Sterling New Superkings Green (post-EUTPD) have a firmer filter and a less hard rod compared to Sterling Dual Superkings Capsule (pre-EUTPD).

#### Smell before smoking

Both post-EUTPD versions show a completely different smell profile than Sterling Dual Superkings Capsule (pre-EUTPD): While Mayfair New Green (post-EUTPD) and Sterling New Superkings Green (post-EUTPD) are described by a fruity, sourish, alcohol and citrus/tropical like smell impression, Sterling Dual Superkings Capsule (pre-EUTPD) is described by hay like. All three versions have a sweetish smell impression with both post-EUTPD versions being perceived more intense (Mayfair New Green post-EUTPD is perceived even more intense than Sterling New Superkings Green).

#### Taste

Sterling New Superkings Green (post-EUTPD) and Mayfair New Green (post-EUTPD) have a fruity taste and a bitter taste impression, Sterling Dual Superkings Capsule (pre-EUTPD) has a spearmint taste impression. All three products are described by a menthol taste impression (although post-EUTPD versions are perceived less intense compared to the one pre-EUTPD).

#### Sensation while smoking

Mayfair New Green (post-EUTPD) and Sterling New Superkings Green (post-EUTPD) evoke a less intense cooling effect than Sterling Dual Superkings Capsule (pre-EUTPD).

#### Strength/impact

Sterling New Superkings Green (post-EUTPD) is harder to draw and has less intense impact than Sterling Dual Superkings Capsule (pre-EUTPD) which is on par with Mayfair New Green (post-EUTPD) in both descriptors. Furthermore, both post-EUTPD versions evoke less intense trigeminal stimuli than Sterling Dual Superkings Capsule (pre-EUTPD).

(please see annex I for details)



## Annex

### I. Results Mean Comparison

#### Differences Mayfair New Green (post-EUTPD) vs. Sterling New Superkings Green (post-EUTPD) vs. Sterling Dual Superkings Capsule (pre-EUTPD)

##### FEEL/TOUCH BEFORE SMOKING

###### FIRM FILTER

- A MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)
- B STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### ROD HARDNESS

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)
- B MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

##### SMELL BEFORE SMOKING

###### FRUITY

- A MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)
- B (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### SOURISH

- A MAYFAIR NEW GREEN (POST-EUTPD)
- B STERLING NEW SUPERKINGS GREEN (POST-EUTPD)
- C (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### ALCOHOL

- A MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)
- B (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### CITRUS/TROPICAL

- A STERLING NEW SUPERKINGS GREEN (POST-EUTPD), MAYFAIR NEW GREEN (POST-EUTPD)
- B (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### SWEETISH

- A MAYFAIR NEW GREEN (POST-EUTPD)
- B STERLING NEW SUPERKINGS GREEN (POST-EUTPD)
- C STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

###### HAY LIKE

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)
- B (NONE) STERLING NEW SUPERKINGS GREEN (POST-EUTPD), MAYFAIR NEW GREEN (POST-EUTPD)

##### TASTE

###### BITTER

- A STERLING NEW SUPERKINGS GREEN (POST-EUTPD), MAYFAIR NEW GREEN (POST-EUTPD)
- B (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

## FRUITY

- A STERLING NEW SUPERKINGS GREEN (POST-EUTPD), MAYFAIR NEW GREEN (POST-EUTPD)  
B (NONE) STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)

## MENTHOL

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)  
B MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

## SPEARMINT

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)  
B (NONE) MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

**SENSATION WHILE SMOKING**

## COOLING EFFECT

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)  
B MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

**STRENGTH/IMPACT**

## EASE OF DRAWING

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD), MAYFAIR NEW GREEN (POST-EUTPD)  
B STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

## IMPACT

- A MAYFAIR NEW GREEN (POST-EUTPD), STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)  
B STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

## TRIGEMINAL STIMULI

- A STERLING DUAL SUPERKINGS CAPSULE (PRE-EUTPD)  
B MAYFAIR NEW GREEN (POST-EUTPD), STERLING NEW SUPERKINGS GREEN (POST-EUTPD)

Notes: Versions with the same letter are not significantly different. Letter A states the higher value.

## II. Descriptive Panel Principles

### Data Collection

Descriptive Panel	The products were assessed by the Descriptive Panel FMC 2 based in Hamburg (Germany) in quantitative design (triplicate). A <b>sensory Descriptive Panel</b> is a team of trained assessors who define the <b>sensory</b> attributes (taste, appearance, texture etc.) which best describe products that are being evaluated. Our <b>panel</b> <sup>1</sup> is trained on a regular basis to ensure continued alignment on descriptors. The panel consists of regular consumers of the respective product category who are working as freelancers and are not employees of IB. We do not share the brand/product data with panellists so that they can provide unbiased data. They are carefully selected based on their high sensorial sensitivity. The evaluation was done by 11 panellists.
Dates	9 – 11 and 24 – 26 June 2020
Approach	<p>Sample presentation is randomised and balanced to avoid order and carry-over effects.</p> <p>The tests were conducted according to ISO standard test requirements<sup>2</sup> (in-house test room and sample serving conditions<sup>3</sup>).</p> <p>Abstinance from smoking and strong tasting food prior to a profiling session: The panel is not allowed to smoke or to consume any other nicotine containing products until at least 60 minutes prior to a panel session. They are also required to not consume taste influencing food like coffee or chewing gums before the session.</p> <p>Each panellist assesses six products within two hours with a neutralisation phase of 15 minutes in between.</p> <p>Non-sparkling water and Matzen<sup>®4</sup> are used for neutralisation between standard products. Menthol related taste impressions are neutralised by eating a small piece of chocolate.</p> <p>The panel does not smoke the whole cigarette, but is asked to take 5 puffs. They can take one more puff to make sure they get all impressions.</p>
Descriptors	<p>This project was conducted utilising the agreed questionnaire defined for this project (see annex III). The panellists assess the presence and intensity of the descriptors via an online questionnaire, utilising a 0 – 100 scale.</p> <p>All descriptors have at least one reference sample, representing one specific scale range, based on consensus. These are presented regularly in the weekly training for calibration.</p>

<sup>1</sup> *Sensorische Analyse – Allgemeiner Leitfaden für die Auswahl, Schulung und Überprüfung ausgewählter Prüfer und Sensoriker (DIN EN ISO 8586:2014-05)*

<sup>2</sup> *Sensory analysis - General guidance for the design of test rooms (ISO 8589:2007 + Amd 1:2014); German version EN ISO 8589:2010 + A1:2014*

<sup>3</sup> During Covid-19 time, the panel conducted the assessments as “working from home”

<sup>4</sup> An unleavened, unsalted bread

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Sample preparation	All samples are masked by applying correction fluid <sup>5</sup> on the visual brand clues. All samples are packed in clear tubes <sup>6</sup> as single sticks. The tubes contain a random four-digit code. The samples for one day are bundled together and handed out to the panellists. The order of the assessment is fixed for each panellist in the online questionnaire tool. Each step of the preparation process complies with the highest hygiene standards.
Data quality assurance	Projects responding to data quality are run on a regular basis to monitor panel performance.

### Data Analysis

Method	Differences on mean scores are calculated on product basis, utilising two-way ANOVA. Confidence level is 95 % ( $\alpha = 0.05$ ). Only descriptors which show a significant difference between products are shown in the report. Differences are visualised by applying <i>Duncan Grouping</i> as post-hoc-test. Descriptors which have a mean score below the defined perception threshold <sup>7</sup> are not reported. If at least one product is above perception threshold in a particular descriptor, the descriptor is reported and those products without noticeable impression are marked with 'none' next to the Duncan group.
Date	30 June 2020

<sup>5</sup> Kores Europe s.r.o.: Waterbased Kores Aqua Correction Fluid (20 ml | Art.-Nr.: 69101)

<sup>6</sup> Sarstedt AG & Co. KG: Tubes (14 ml, 105 x 16.8 mm, PS | Prod.-Nr.: 55.463)

<https://www.sarstedt.com/produkte/labor/reagenz-zentrifugenroehren/roehren/produkt/55.463/>

Sarstedt AG & Co. KG: Push cap, neutral (Prod.-Nr.: 65.793)

<https://www.sarstedt.com/produkte/labor/reagenz-zentrifugenroehren/verschluesse/produkt/65.793/>

<sup>7</sup> Defined area for below defined threshold: 0 – 15 (scale: 0 – 100)

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### III. Customised Questionnaire for Project Swift

Displayed to Panel (German)	Descriptor (English)	Category
Heu (wenig – viel)	Haylike smell	Smell
Süß (kaum – sehr)	Sweetish smell	Smell
Schokolade (wenig – viel)	Chocolate smell	Smell
Harnig (kaum – sehr)	Ammoniac smell	Smell
Gelöschtes Feuer (wenig – viel)	Put out campfire smell	Smell
Menthol (wenig – viel)	Menthol smell	Smell
Spearmint (wenig – viel)	Spearmint smell	Smell
Vanille (wenig – viel)	Vanilla smell	Smell
Zitrus/Tropisch (kaum – sehr)	Citrus/tropical smell	Smell
Alkohol (wenig – viel)	Alcohol smell	Smell
Fruchtig (kaum – sehr)	Fruity smell	Smell
Karamell im Geruch (wenig – viel)	Caramel smell	Smell
Sauer (kaum – sehr)	Sourish smell	Smell
Perforation (undeutlich – deutlich)	Perforation visible	Optics/Haptic
Stranghärte (weich – hart)	Rod hardness	Optics/Haptic
Filterfestigkeit (weich – hart)	Filter firmness	Optics/Haptic
Impact (wenig – viel)	Impact	Strength/Impact
Ziehbarkeit (schwer – leicht)	Ease of drawing	Strength/Impact
Kühler Eindruck (wenig – viel)	Cooling effect	Strength/Impact (Sensation)
Heu (wenig – viel)	Hay like taste	Taste
Holzig (kaum – sehr)	Woody taste	Taste
Bitter (kaum – sehr)	Bitter taste	Taste
Süß (kaum – sehr)	Sweetish taste	Taste
Menthol (wenig – viel)	Menthol taste	Taste
Spearmint (wenig – viel)	Spearmint taste	Taste
Fruchtig (kaum – sehr)	Fruity taste	Taste
Irritation (wenig – viel)	Trigeminal stimuli	Strength/Impact
Abbrandgeschwindigkeit (langsam – schnell)	Burning speed	Optics during smoking
Aschestabilität (instabil – stabil)	Ash stability	Optics during smoking
Gleichmäßigkeit des Abbrandes (unregelmäßig – regelmäßig)	Burn-off behaviour	Optics during smoking