

16/06/2020

PROJECT SWIFT – SPECIAL SESSION FINDINGS



GLOBAL SENSORY

PD Concepts

Preface

This report presents the outcome of two special sessions that have been conducted in May 2020. Special sessions are required in Sensorial queries in particular when assessing products that show off with new dimensions other than the wellknown perceptions which are already covered by a standard questionnaire, responding to all known properties of a product.

Why Special Sessions

“An overall sensory profile describes the sensory attributes of a product. A "product" is characterized by several parameters. Some of these have a single dimension (e.g. the diameter of a ball, the weight of a sachet, etc.) and others have several dimensions (e.g. the shape of a product, the texture of meat, etc.); a sensory profile requires monodimensional quantities to lead to a measurement of intensity.

Consequently, the evaluation of a complex sensory quantity needs methodology which is founded on identification of appropriate descriptors. This work is given to a trained panel who describe their perceptions both qualitatively (nature of the stimulus) and quantitatively (intensity of each stimulus). If the aim is to appreciate all the attributes, an "overall sensory profile" is built; if it concerns the evaluation of only flavour, odour, texture or appearance, a "partial sensory profile" is then elaborated. In both cases, the choice of descriptors is the preliminary phase which determines the quality of the sensory profile.

There are several ways to establish a list of descriptors, for example:

- a) leave each assessor to choose and use, for the final profile, his/her own descriptors (free-choice profile)*
- b) use descriptors common to all the members of the panel, either*
 - 1) by suggesting existing descriptors, on condition that the relevance of the descriptors for the product has been checked and that the assessors have been trained on these descriptors (generally with the help of reference products), or*
 - 2) by the creation of descriptors by all the members of the panel after individual or collective work.”*

In our case, b) 2) is the principle that has been applied.

ISO 11035:1994(en) Sensory analysis — Identification and selection of descriptors for establishing a sensory profile by a multidimensional approach.

The Descriptive Panel Location Hamburg

The descriptive panel in Hamburg is well established evaluation tool (25 years of experience). The panel in this case is dedicated to the assessment of factory made cigarettes (FMC). It consists of 17 people and is a constant group of people who have been recruited according to a screening test proving their sensitivity in all areas of human senses. The participants are regular consumers and are not a part of any ITG department.

The panel is trained to evaluate FMC according to all properties of the product category in order to respond to features that are accessible for regular consumers. They are trained to identify specific intensities of product features without having a deeper understanding about the different aspects of the product. All kinds of assessments are performed in a fully blinded way which means that our panellists have no information about brands and market origin of the products they describe. Products are described in an objective way without any questions around liking and preferences. The training itself is done by a moderator that structures the training sessions according to the purpose but always acts neutrally – which means the panel works free from leader’s influence.

(According to: DIN EN ISO 8586:2014-05 „Sensorische Analyse – Allgemeiner Leitfaden für die Auswahl, Schulung und Überprüfung ausgewählter Prüfer und Sensoriker“)

Global Sensory

Date of report: 16/06/2020

Project: Special Session – Project Swift**Market: Slovenia, UK, Germany****Segment: KS / Special Flavours****Sessions: May 18th 2020 / May 29th 2020****Attendees: Session 1: 17 / Session 2: 15 panellists**

Background

JTI recently launched new products in various EU countries to be sold post 20 May 2020. First feedback from the markets indicate that several SKUs show a noticeable menthol impression. The aim of this research is to determine which of the new products have characterising smell or taste (menthol or other flavour distinct from tobacco).

Winston Xspression Green Slovenia was used in the first session for the simple description test. The same product together with Sovereign New Dual and Winston Green DE were part of the second session for confirming the simple description test results of session one.

This research aimed to establish whether:

- a smell or taste of menthol or other flavour distinct from tobacco could be detected?
- the flavour notes could be described in order to cross-check with our standard descriptive questionnaires?
- additional attributes would be required to assess the sensorial performance of the products?

Executive summary

Both JTI products (Winston Xspression Green SI and Sovereign New Dual UK) demonstrate noticeable menthol flavour related sensations. This includes a noticeable menthol taste and a cooling effect in the mouth. The panellists were unable to find a menthol smell impression. The panellists achieved consensus about the menthol taste impressions as well as the new defined descriptive attributes (see last page for details). Preliminary lab results show that menthol in smoke is measurable – even though on a lower level than ‘regular’ menthol products.

Winston Green DE (‘Neuer Blend’) clearly differentiates from the Slovenian / UK samples and shows no menthol sensations at all. This has since confirmed by laboratory results which indicates that there is no menthol in the blend.

The Products

Version	Winston Xspression Green	Sovereign New Dual	Winston Green ('Neuer Blend')
Name In Report	Winston Xspression Green	Sovereign New Dual	Winston Green
Session	1+2	2	2
Brand	Winston	Sovereign	Winston
Country of Sale	Slovenia (SI)	UK	Germany (DE)
Tar / Nic / CO	5 / 0.44 / 6	8.6 / 0.67 / 9.6	
Menthol in smoke (mg/Cig)	0.115*	Not available	No menthol in smoke
Menthol (cig)	Not available	1.12 mg	No menthol in cig
Filter	Mono-AC	Mono-AC	Mono-AC

* preliminary – further assessments in view of origin of measured menthol in smoke values ongoing

Methodology and initial findings

1st Session: Simple Descriptive Test (Qualitative Method)

The panellists were asked to describe cigarettes in following characteristics:

- Smell before smoking
- Taste and Mouthfeel while smoking

Group discussion after evaluation of the cigarettes

Summary - Simple Descriptive Test (Session 1)

	Winston Xspression Green Slovenia
Taste while smoking	- Sweet (13) - Menthol (14) - Fruity (11)
<i>Group Discussion</i>	Menthol Taste Consensus amongst panellists that menthol taste is noticeable
Mouthfeel while smoking	- Cooling Effect in mouth (17)
Smell before smoking	- Sweet (16) - Fruity (15) - Alcoholic (14) - Citrus / tropical (14) - Sourish (13)

2nd Session: Confirmation of first session results by using same Winston Slovenia version + additionally Sovereign New Dual for questionnaire validation

The panellists are asked to describe the cigarettes in the following characteristics:

- Smell before smoking
- Taste and Mouthfeel while smoking

Group discussion after evaluation of the cigarettes

Summary – Simple Descriptive Test Session 2 (Qualitative Method)

	Winston Xspression Green Slovenia	Sovereign New Dual
Taste while smoking	Results of first session are confirmed	Panellists confirm the same taste characteristics as per Winston Xspression Green including noticeable menthol taste
<i>Group Discussion</i>	Menthol Taste Consensus amongst panellists that menthol taste is noticeable	Intensities Consensus amongst panellists that menthol taste is higher than for Winston Xspression Green
Mouthfeel while smoking	- Cooling effect in mouth (17)	Consensus amongst panellists that cooling effect is higher than for Winston Xspression Green
<i>Group Discussion</i>	Cooling Effect Consensus amongst panellists that cooling effect is noticeable	
Smell before smoking	Results of first session are confirmed	Panellists confirm the same smell characteristics as per Winston Xspression Green

The final questionnaire for project SWIFT is shown in the attachment

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Attachment

Final questionnaire after panel alignment for project SWIFT

FRAGE_TEXT	descriptor (english)	category	questionnaire
Heu (Geruch)	hay like smell	Smell	standard
süß (Geruch)	sweetish smell	Smell	standard
Schokolade (Geruch)	chocolate smell	Smell	standard
harnig (Geruch)	ammoniac smell	Smell	standard
gelöschtes Feuer (Geruch)	put out campfire smell	Smell	standard
Menthol (Geruch)	menthol smell	Smell	standard+menthol
Spearmint (Geruch)	spearmint smell	Smell	standard+menthol
Vanille (wenig--viel)	vanila smell	Smell	standard+menthol+special for this project
Zitrus/Tropisch	citrus/tropical smell	Smell	standard+menthol+special for this project
Alkohol (wenig - viel)	alcohol smell	Smell	standard+menthol+special for this project
fruchtig (wenig - viel)	fruity smell	Smell	standard+menthol+special for this project
Karamell im Geruch (wenig-viel)	caramel smell	Smell	standard+menthol+special for this project
sauer (kaum - sehr)	sourish smell	Smell	standard+menthol+special for this project
Perforation (undeutlich - deutlich)	perforation visible	Optic/Haptic	standard
Stranghärte (weich-hart)	rod hardness	Optic/Haptic	standard
Filterfestigkeit: weich-hart	filter firmness	Optic/Haptic	standard
Impact	impact	Strength/Impact	standard
Ziehbarkeit (schwer-leicht)	ease of drawing	Strength/Impact	standard
kühler Eindruck	cooling effect	Strength/Impact	standard+menthol
heuig (Geschmack)	hay like taste	Taste	standard
holzig (Geschmack)	woody taste	Taste	standard
bitter (Geschmack)	bitter taste	Taste	standard
süß (Geschmack)	sweetish taste	Taste	standard
Menthol (wenig -- viel)	menthol taste	Taste	standard+menthol
Spearmint (wenig -- viel)	spearmint taste	Taste	standard+menthol
fruchtig (wenig - viel)	fruity taste	Taste	standard+menthol+special for this project
Irritation	irritation	Strength/Impact	standard
Abbrandgeschwindigkeit	burning speed	Optic during smoking	standard
Aschestabilität (instabil - stabil)	ash stability	Optic during smoking	standard
Gleichmäßigkeit des Abbrandes	burn-off behaviour	Optic during smoking	standard

Global Sensory

Date of report: 24/06/2020

Project: Project Swift - UK**Market: UK****Segment: Low Tar**

Background

In the UK market the derogation for characterising menthol flavours ended on 20th 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 Benson & Hedges Dual, Benson & Hedges Blue Dual, Sterling Dual and Sovereign Dual – each version with ‘new’ as descriptor in the brand name and in KS format. 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 versions?
- 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

- all pre-EUTPD versions do have a crushball. The capsule 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.
- the format for B&H Superkings Blue Dual and Sterling Dual Superkings Capsule is different to their post-EUTPD SKU equivalent (KS). Direct comparisons are influenced by format.
- the filter type for Sovereign Dual changed from mono filter to Holobore filter.

Conclusion

Each post-EUTPD version shows a completely different smell profile compared to its pre-EUTPD counterpart. The post-EUTPD products are not described by any tobacco related smell attributes such as 'hay like' representing Virginia tobaccos – a common descriptor for the pre-EUTPD versions. 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 each post-EUTPD product is described by a **menthol taste** impression and evokes a **cooling effect** – even though less intense compared to its pre-EUTPD counterpart.

'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).

Additional Findings

Post-EUTPD versions show increased filter firmness and burn quicker than pre-EUTPD versions (with the only exception of B&H New Blue Dual).

Versions

Version	B&H Dual (pre-EUTPD)	B&H New Dual (post-EUTPD)	B&H Superkings Blue Dual (pre-EUTPD)	B&H New Blue Dual (post-EUTPD)	Sterling Dual Superkings Capsule (pre-EUTPD)	Sterling New Dual (post-EUTPD)	Sovereign Dual (pre-EUTPD)	Sovereign New Dual (post-EUTPD)
Brand	Benson & Hedges	Benson & Hedges	Benson & Hedges	Benson & Hedges	Sterling	Sterling	Sovereign	Sovereign
Country of Sale	UK (before May 2020)	UK (as of May 2020)	UK (before May 2020)	UK (as of May 2020)	UK (before May 2020)	UK (as of May 2020)	UK (before May 2020)	UK (as of May 2020)
Analysis No. (Lab)	295662 295670	295666 295674	295663 295671	295667 295675	295660 295668	295665 295673	295661 295669	295664 295672
Format	KS	KS	SKS	KS	SKS	KS	KS	KS
T/N/CO (crushed in case of CB)	8.0 / 0.63 / 8.8	7.8 / 0.67 / 9.5	7.5 / 0.67 / 7.7	7.8 / 0.69 / 9.2	8.9 / 0.77 / 8.3	7.8 / 0.66 / 8.9	8.1 / 0.64 / 8.3	7.5 / 0.63 / 8.3
Menthol in Cigarette [mg/cig]	n / a	1.14	n / a	1.09	0.626	1.12	n / a	1.12
Menthol in Crushball [mg/ball]	3.23	n / a	3.14	n / a	3.16	n / a	3.18	n / a
Menthol in Smoke [mg/cig]	0.64	0.15	0.60	0.16	0.63	0.17	0.60	0.14
Rod Weight [mg]	637.3	*	816.9	*	842.1	600.7	642.2	584.1
Filter	Mono Filter	Mono Filter	Mono Filter	Mono Filter	Mono Filter	Mono Filter	Mono Filter	Holobore Filter
Cigarette Paper	MV	MV	MV	MV	MV	MV	MV	MV
Filter Ventilation [%]	28.8	*	48.5	*	50.3	30.5	27.2	32.6
Puff Number (crushed in case of CB)	5.8	6.0	7.9	5.9	8.4	5.8	5.8	5.8
DP Index	19455	19448	19456	19445	19457	19447	19458	19446
Series	D5485	D5481	D5485	D5481	D5485	D5481	D5485	D5481

* Due to a low amount of samples, these parameters could not be measured – new samples available and results will be forwarded in due course

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

Report

Differences B&H New Dual (post-EUTPD) vs. B&H Dual (pre-EUTPD)

The versions are sensory wise distinguishable.

Optics before smoking

B&H New Dual (post-EUTPD) has a less visible perforation than B&H Dual (pre-EUTPD).

Optics during smoking

B&H New Dual (post-EUPTD) burns quicker than B&H Dual (pre-EUTPD).

Feel/touch before smoking

B&H New Dual (post-EUPTD) has a firmer filter and a less hard rod compared to B&H Dual (pre-EUTPD).

Smell before smoking

Both B&H Dual versions show a completely different smell profile: While B&H New Dual (post-EUTPD) is described by a fruity, sourish, alcohol and citrus/tropical like smell impression, B&H Dual (pre-EUTPD) is described by hay like. Both have a sweetish smell impression with B&H New Dual being perceived more intense.

Taste

B&H New Dual (post-EUTPD) has a fruity taste impression, B&H Dual (pre-EUTPD) has a spearmint taste impression. Both products are described by a menthol taste impression (although B&H post-EUTPD version is perceived less intense compared to the one pre-EUTPD) and a sweet taste impression (with B&H New Dual being perceived more intense).

Sensation while smoking

B&H New Dual (post-EUTPD) evokes a less intense cooling effect than B&H Dual (pre-EUTPD).

Strength/impact

B&H New Dual (post-EUTPD) evokes less intense trigeminal stimuli than B&H Dual (pre-EUTPD).

(please see attachment for details)

Differences B&H New Blue Dual (post-EUTPD) vs. B&H Superkings Blue Dual (pre-EUTPD)

The versions are sensory wise distinguishable.

There are no differences in sensation while smoking and strength/impact.

Optics before smoking

B&H New Blue Dual (post-EUTPD) has a less visible perforation than B&H Superkings Blue Dual (pre-EUTPD).

Optics during smoking

B&H New Blue Dual (post-EUPTD) burns less regularly than B&H Superkings Blue Dual (pre-EUTPD).

Feel/touch before smoking

B&H New Blue Dual (post-EUPTD) has a firmer filter and a harder rod compared to B&H Superkings Blue Dual (pre-EUTPD).

Smell before smoking

Both B&H Dual versions show a completely different smell profile: While B&H New Blue Dual (post-EUTPD) is described by a fruity, sourish, alcohol and citrus/tropical like smell impression, B&H Superkings Blue Dual (pre-EUTPD) is described by hay like. Both have a sweetish smell impression with B&H New Blue Dual being perceived more intense.

Taste

B&H New Blue Dual (post-EUTPD) has a fruity taste impression, B&H Superkings Blue Dual (pre-EUTPD) has a spearmint taste impression. Both products are described by a menthol taste impression (although B&H post-EUTPD version is perceived less intense compared to the one pre-EUTPD).

(please see attachment for details)

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

The versions are sensory wise distinguishable.

Optics before smoking

Sterling New Dual (post-EUTPD) has a less visible perforation than Sterling Dual Superkings Capsule (pre-EUTPD).

Optics during smoking

Sterling New Dual (post-EUPTD) burns quicker than Sterling Dual Superkings Capsule (pre-EUTPD).

Feel/touch before smoking

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

Smell before smoking

Both B&H Dual versions show a completely different smell profile: While Sterling New Dual (post-EUTPD) is described by a fruity, sourish, alcohol and citrus/tropical like smell impression, Sterling Dual Superkings Capsule (pre-EUTPD) is described by hay like. Both have a sweetish smell impression with Sterling New Dual being perceived more intense.

Taste

Sterling New Dual (post-EUTPD) has a fruity taste impression, Sterling Dual Superkings Capsule (pre-EUTPD) has a spearmint taste impression. Both products are described by a menthol taste impression (although Sterling post-EUTPD version is perceived less intense compared to the one pre-EUTPD).

Sensation while smoking

Sterling New Dual (post-EUTPD) evokes a less intense cooling effect than Sterling Dual Superkings Capsule (pre-EUTPD).

Strength/impact

Sterling New Dual (post-EUTPD) is easier to draw and higher in impact compared to Sterling Dual Superkings Capsule (pre-EUTPD).

(please see attachment for details)

Differences Sovereign New Dual (post-EUTPD) vs. Sovereign Dual (pre-EUTPD)

The versions are sensory wise distinguishable.

Optics before smoking

Sovereign New Dual (post-EUTPD) has a more visible perforation than Sovereign Dual (pre-EUTPD).

Optics during smoking

Sovereign New Dual (post-EUPTD) burns quicker than Sovereign Dual (pre-EUTPD).

Feel/touch before smoking

Sovereign New Dual (post-EUPTD) has a firmer filter and a less hard rod compared to Sovereign Dual (pre-EUTPD).

Smell before smoking

Both Sovereign versions show a completely different smell profile: While Sovereign New Dual (post-EUTPD) is described by a fruity, sourish, alcohol and citrus/tropical like smell impression, Sovereign Dual (pre-EUTPD) is described by hay like. Both have a sweetish smell impression with Sovereign New Dual being perceived more intense.

Taste

Sovereign New Dual (post-EUTPD) has a fruity taste impression, Sovereign Dual (pre-EUTPD) has a spearmint taste impression. Both products are described by a menthol taste impression (although Sovereign post-EUTPD version is perceived less intense compared to the one pre-EUTPD).

Sensation while smoking

Sovereign New Dual (post-EUTPD) evokes a less intense cooling effect than Sovereign Dual (pre-EUTPD).

Strength/impact

Sovereign New Dual (post-EUTPD) is harder to draw, lower in impact and evokes less intense trigeminal stimuli compared to Sovereign Dual (pre-EUTPD).

(please see attachment for details)



Annex

I. Results Mean Comparison

Differences B&H New Dual (post-EUTPD) vs. B&H Dual (pre-EUTPD)

OPTICS BEFORE SMOKING

PERFORATION VISIBLE

- A B&H DUAL (PRE-EUTPD)
- B B&H NEW DUAL (POST-EUTPD)

OPTICS DURING SMOKING

QUICK BURNING

- A B&H NEW DUAL (POST-EUTPD)
- B B&H DUAL (PRE-EUTPD)

FEEL/TOUCH BEFORE SMOKING

FIRM FILTER

- A B&H NEW DUAL (POST-EUTPD)
- B B&H DUAL (PRE-EUTPD)

ROD HARDNESS

- A B&H DUAL (PRE-EUTPD)
- B B&H NEW DUAL (POST-EUTPD)

SMELL BEFORE SMOKING

FRUITY

- A B&H NEW DUAL (POST-EUTPD)
- B (NONE) B&H DUAL (PRE-EUTPD)

SOURISH

- A B&H NEW DUAL (POST-EUTPD)
- B (NONE) B&H DUAL (PRE-EUTPD)

ALCOHOL

- A B&H NEW DUAL (POST-EUTPD)
- B (NONE) B&H DUAL (PRE-EUTPD)

CITRUS/TROPICAL

- A B&H NEW DUAL (POST-EUTPD)
- B (NONE) B&H DUAL (PRE-EUTPD)

SWEETISH

- A B&H NEW DUAL (POST-EUTPD)
- B B&H DUAL (PRE-EUTPD)

HAY LIKE

- A B&H DUAL (PRE-EUTPD)
- B (NONE) B&H NEW DUAL (POST-EUTPD)

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TASTE

SWEET

- A B&H NEW DUAL (POST-EUTPD)
B B&H DUAL (PRE-EUTPD)

FRUITY

- A B&H NEW DUAL (POST-EUTPD)
B (NONE) B&H DUAL (PRE-EUTPD)

MENTHOL

- A B&H DUAL (PRE-EUTPD)
B B&H NEW DUAL (POST-EUTPD)

SPEARMINT

- A B&H DUAL (PRE-EUTPD)
B (NONE) B&H NEW DUAL (POST-EUTPD)

SENSATION WHILE SMOKING

COOLING EFFECT

- A B&H DUAL (PRE-EUTPD)
B B&H NEW DUAL (POST-EUTPD)

STRENGTH/IMPACT

TRIGEMINAL STIMULI

- A B&H DUAL (PRE-EUTPD)
B B&H NEW DUAL (POST-EUTPD)

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

Differences B&H New Blue Dual (post-EUTPD) vs. B&H Superkings Blue Dual (pre-EUTPD)

OPTICS BEFORE SMOKING

PERFORATION VISIBLE

- A B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)
- B B&H NEW BLUE DUAL (POST-EUTPD)

OPTICS DURING SMOKING

BURN OFF BEHAVIOUR

- A B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)
- B B&H NEW BLUE DUAL (POST-EUTPD)

FEEL/TOUCH BEFORE SMOKING

FIRM FILTER

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

ROD HARDNESS

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

SMELL BEFORE SMOKING

FRUITY

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B (NONE) B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

SOURISH

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B (NONE) B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

ALCOHOL

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B (NONE) B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

CITRUS/TROPICAL

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B (NONE) B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

SWEETISH

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

HAY LIKE

- A B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)
- B (NONE) B&H NEW BLUE DUAL (POST-EUTPD)

TASTE

FRUITY

- A B&H NEW BLUE DUAL (POST-EUTPD)
- B (NONE) B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)

MENTHOL

- A B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)
- B B&H NEW BLUE DUAL (POST-EUTPD)

SPEARMINT

- A B&H SUPERKINGS BLUE DUAL (PRE-EUTPD)
- B (NONE) B&H NEW BLUE DUAL (POST-EUTPD)

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

Differences Sterling New Dual (post-EUTPD) vs. Sterling Dual Superkings Capsule (pre-EUTPD)**OPTICS BEFORE SMOKING**

PERFORATION VISIBLE

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

OPTICS DURING SMOKING

QUICK BURNING

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

FEEL/TOUCH BEFORE SMOKING

FIRM FILTER

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

ROD HARDNESS

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

SMELL BEFORE SMOKING

FRUITY

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

SOURISH

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

ALCOHOL

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

CITRUS/TROPICAL

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

SWEETISH

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

HAY LIKE

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

TASTE

FRUITY

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

MENTHOL

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

SPEARMINT

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

SENSATION WHILE SMOKING

COOLING EFFECT

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

STRENGTH/IMPACT

EASE OF DRAWING

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

IMPACT

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

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

Differences Sovereign New Dual (post-EUTPD) vs. Sovereign Dual (pre-EUTPD)**OPTICS BEFORE SMOKING**

PERFORATION VISIBLE

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B SOVEREIGN DUAL (PRE-EUTPD)

OPTICS DURING SMOKING

QUICK BURNING

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B SOVEREIGN DUAL (PRE-EUTPD)

FEEL/TOUCH BEFORE SMOKING

FIRM FILTER

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B SOVEREIGN DUAL (PRE-EUTPD)

ROD HARDNESS

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (POST-EUTPD)

SMELL BEFORE SMOKING

FRUITY

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B (NONE) SOVEREIGN DUAL (PRE-EUTPD)

SOURISH

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B (NONE) SOVEREIGN DUAL (PRE-EUTPD)

ALCOHOL

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B (NONE) SOVEREIGN DUAL (PRE-EUTPD)

CITRUS/TROPICAL

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B (NONE) SOVEREIGN DUAL (PRE-EUTPD)

SWEETISH

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B SOVEREIGN DUAL (PRE-EUTPD)

HAY LIKE

- A SOVEREIGN DUAL (PRE-EUTPD)
- B (NONE) SOVEREIGN NEW DUAL (POST-EUTPD)

TASTE

FRUITY

- A SOVEREIGN NEW DUAL (POST-EUTPD)
- B (NONE) SOVEREIGN DUAL (PRE-EUTPD)

MENTHOL

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (POST-EUTPD)

SPEARMINT

- A SOVEREIGN DUAL (PRE-EUTPD)
- B (NONE) SOVEREIGN NEW DUAL (POST-EUTPD)

SENSATION WHILE SMOKING

COOLING EFFECT

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (POST-EUTPD)

STRENGTH/IMPACT

EASE OF DRAWING

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (POST-EUTPD)

IMPACT

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (POST-EUTPD)

TRIGEMINAL STIMULI

- A SOVEREIGN DUAL (PRE-EUTPD)
- B SOVEREIGN NEW DUAL (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 sensory Descriptive Panel is a team of trained assessors who define the sensory attributes (taste, appearance, texture etc.) which best describe products that are being evaluated. Our panel 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	04 – 06 and 09 – 11 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 requirements¹ (in-house test room and sample serving conditions²).</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^{®3} 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>
Sample preparation	All samples are masked by applying correction fluid ⁴ on the visual brand clues. All samples are packed in clear tubes ⁵ 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.

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

² During Covid-19 time, the panel conducted the assessments as “working from home”

³ An unleavened, unsalted bread

⁴ Kores Europe s.r.o.: Waterbased Kores Aqua Correction Fluid (20 ml | Art.-Nr.: 69101)

⁵ 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/>

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

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 ⁶ 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	19 June 2020

⁶ Defined area for below defined threshold: 0 – 15 (scale: 0 – 100)

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

III. Customised Questionnaire for Project Swift

Displayed to Panel (German)	Descriptor (English)	Category
Heu (wenig – viel)	Hay like 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	Optic/Haptic
Stranghärte (weich – hart)	Rod hardness	Optic/Haptic
Filterfestigkeit (weich – hart)	Filter firmness	Optic/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	Optic during smoking
Aschestabilität (instabil – stabil)	Ash stability	Optic during smoking
Gleichmäßigkeit des Abbrandes (unregelmäßig – regelmäßig)	Burn-off behaviour	Optic during smoking

Global Sensory

Date of report: 01/07/2020

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

Background

In the UK market the derogation for characterising menthol flavours has ended on 20th 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.

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

- 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 sensory Descriptive Panel is a team of trained assessors who define the sensory attributes (taste, appearance, texture etc.) which best describe products that are being evaluated. Our panel ¹ 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 requirements² (in-house test room and sample serving conditions³).</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^{®4} 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>

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

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

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

⁴ An unleavened, unsalted bread

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

Sample preparation	All samples are masked by applying correction fluid ⁵ on the visual brand clues. All samples are packed in clear tubes ⁶ 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 ⁷ 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

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

⁶ 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/>

⁷ Defined area for below defined threshold: 0 – 15 (scale: 0 – 100)

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

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

Global Sensory

Date of report: 21/07/2020

Project: Project Swift – UK (Part 3)**Market: UK****Segment: Low Tar**

Background

In the UK market the derogation for characterising menthol flavours has ended on 20th 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 Benson & Hedges Dual, Benson & Hedges Blue Dual, Sterling Dual and Sovereign Dual – each version with ‘new’ as descriptor in the brand name and in KS format. 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-EUTPD and standard Virginia blend versions?
- 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

- a comparison for grouping was performed in order to understand key differences between standard Virginia blend products and the JTI New Dual products. Standard Virginia blend product group show off with rather limited differences between each other. Detailed results to be found in annex I.

Conclusion

New Dual post-EUTPD product group shows a completely different smell profile compared to the standard Virginia blend product group. The New Dual post-EUTPD product group are not described by any tobacco related smell attributes such as 'hay like' – a descriptor for the standard Virginia blend product group. The New Dual post-EUTPD product group is clearly described by fruity, sourish, alcohol and citrus/tropical like notes in smell.

Also taste wise a fruity impression is noticeable; furthermore, New Dual post-EUTPD product group is described by a **menthol taste** impression and evokes a **cooling effect**. Standard Virginia blend product group are mainly described by hay like and bitter notes in taste.

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

'Cooling effect' and 'menthol taste' (New Dual post-EUTPD product group) leads to higher strength perception compared to standard Virginia blend product group.

Versions

Group Comparison	New Dual	New Dual	New Dual	New Dual	Standard	Standard	Standard	Standard
Version	B&H New Dual (post-EUTPD)	B&H New Blue Dual (post-EUTPD)	Sterling Dual New (post-EUTPD)	Sovereign New Dual (post-EUTPD)	Benson & Hedges Silver	Benson & Hedges Sky Blue	Sterling Blue	Sovereign Sky Blue
Brand	Benson & Hedges	Benson & Hedges	Sterling	Sovereign	Benson & Hedges	Benson & Hedges	Sterling	Sovereign
Country of Sale	UK (as of May 2020)	UK	UK	UK	UK			
Analysis No. (Lab)	295666 295674	295667 295675	295665 295673	295664 295672	295698	295699	295701	295700
Format	KS	KS	KS	KS	KS	KS	KS	KS
T/N/CO	7.8 / 0.67 / 9.5	7.8 / 0.69 / 9.2	7.8 / 0.66 / 8.9	7.5 / 0.63 / 8.3	7.6 / 0.68 / 8.5	6.3 / 0.58 / 7.7	7.6 / 0.72 / 8.3	7.2 / 0.64 / 8.2
Menthol in Cigarette [mg/cig]	1.14	1.09	1.12	1.12	**	**	**	**
Menthol in Crushball [mg/ball]	n / a	n / a	n / a	n / a	**	**	**	**
Menthol in Smoke [mg/cig]	0.15	0.16	0.17	0.14	**	**	**	**
Rod Weight [mg]	*	*	600.7	584.1	690.1	688.9	693.7	705.8
Filter	Mono Filter (white tipping paper)	Mono Filter (white tipping paper)	Mono Filter (white tipping paper)	Holobore Filter (white tipping paper)	Mono Filter (cork tipping paper)			
Cigarette Paper	MV	MV	MV	MV	MV	MV	MV	MV
Filter Ventilation [%]	*	*	30.5	32.6	29.0	36.4	38.5	42.0
Puff Number	6.0	5.9	5.8	5.8	6.0	6.2	6.9	7.0
DP Index	19448	19445	19447	19446	19498	19499	19500	19501
Series	D5481	D5481	D5481	D5481	D5494	D5494	D5494	D5494

* Due to a low number of samples, these parameters could not be measured – new samples available and results will be forwarded in due course.

** No menthol assessment (MCA) performed in the laboratories as no indication for menthol was given.

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

Report

Differences New Dual (post-EUTPD) Group vs. Standard Virginia Blend Group

The versions are sensory wise distinguishable.

Optics before smoking

New Dual (post-EUTPD) group has a less visible perforation than Standard group.

Optics during smoking

New Dual (post-EUTPD) group burns quicker than Standard group.

Feel/touch before smoking

New Dual (post-EUTPD) group has a less hard rod compared to Standard group.

Smell before smoking

New Dual (post-EUTPD) group shows a completely different smell profile than Standard group. While New Dual (post-EUTPD) group is described by a fruity, sourish, alcohol and citrus/tropical like smell impression, Standard group is described by hay like. Both have a sweetish smell impression with New Dual (post-EUTPD) group being perceived more intense.

Taste

New Dual (post-EUTPD) group has a fruity, sweet and menthol taste impression. Standard group has a hay like and woody taste impression. Both groups are described by a bitter taste impression (although New Dual post-EUTPD group is perceived less intense compared to Standard group).

Sensation while smoking

New Dual (post-EUTPD) group evokes a cooling effect, Standard group does not.

Strength/impact

New Dual (post-EUTPD) group is easier to draw, higher in impact and evokes more intense trigeminal stimuli than Standard group.

(please see annex I for details)



Annex

I. Results Mean Comparison

Differences New Dual (post-EUTPD) Group vs. Standard Virginia Blend Group

OPTICS BEFORE SMOKING

PERFORATION VISIBLE

- A STANDARD
- B NEW DUAL (POST-EUTPD)

OPTICS DURING SMOKING

QUICK BURNING

- A NEW DUAL (POST-EUTPD)
- B STANDARD

FEEL/TOUCH BEFORE SMOKING

ROD HARDNESS

- A STANDARD
- B NEW DUAL (POST-EUTPD)

SMELL BEFORE SMOKING

FRUITY

- A NEW DUAL (POST-EUTPD)
- B (NONE) STANDARD

SOURISH

- A NEW DUAL (POST-EUTPD)
- B (NONE) STANDARD

ALCOHOL

- A NEW DUAL (POST-EUTPD)
- B (NONE) STANDARD

CITRUS/TROPICAL

- A NEW DUAL (POST-EUTPD)
- B (NONE) STANDARD

SWEETISH

- A NEW DUAL (POST-EUTPD)
- B STANDARD

HAY LIKE

- A STANDARD
- B (NONE) NEW DUAL (POST-EUTPD)

TASTE

HAY LIKE

- A STANDARD
 B (NONE) NEW DUAL (POST-EUTPD)

WOODY

- A STANDARD
 B (NONE) NEW DUAL (POST-EUTPD)

SWEET

- A NEW DUAL (POST-EUTPD)
 B (NONE) STANDARD

BITTER

- A STANDARD
 B NEW DUAL (POST-EUTPD)

FRUITY

- A NEW DUAL (POST-EUTPD)
 B (NONE) STANDARD

MENTHOL

- A NEW DUAL (POST-EUTPD)
 B (NONE) STANDARD

SENSATION WHILE SMOKING

COOLING EFFECT

- A NEW DUAL (POST-EUTPD)
 B (NONE) STANDARD

STRENGTH/IMPACT

EASE OF DRAWING

- A NEW DUAL (POST-EUTPD)
 B STANDARD

IMPACT

- A NEW DUAL (POST-EUTPD)
 B STANDARD

TRIGEMINAL STIMULI

- A NEW DUAL (POST-EUTPD)
 B STANDARD

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

Differences Benson & Hedges Silver vs. Benson & Hedges Sky Blue vs. Sterling Blue vs. Sovereign Sky Blue

OPTICS BEFORE SMOKING

PERFORATION VISIBLE

- A STERLING BLUE
- B BENSON & HEDGES SILVER
- C SOVEREIGN SKY BLUE, BENSON & HEDGES SKY BLUE

FEEL/TOUCH BEFORE SMOKING

FIRM FILTER

- A SOVEREIGN SKY BLUE, BENSON & HEDGES SKY BLUE, STERLING BLUE
- B BENSON & HEDGES SILVER

SMELL BEFORE SMOKING

HAY LIKE

- A BENSON & HEDGES SKY BLUE, SOVEREIGN SKY BLUE, STERLING BLUE
- B BENSON & HEDGES SILVER

STRENGTH/IMPACT

EASE OF DRAWING

- A BENSON & HEDGES SILVER
- B STERLING BLUE, BENSON & HEDGES SKY BLUE, SOVEREIGN SKY BLUE

IMPACT

- A BENSON & HEDGES SILVER
- AB BENSON & HEDGES SKY BLUE
- B STERLING BLUE, SOVEREIGN SKY BLUE

TRIGEMINAL STIMULI

- A BENSON & HEDGES SILVER
- B BENSON & HEDGES SKY BLUE, SOVEREIGN SKY BLUE, STERLING BLUE

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 sensory Descriptive Panel is a team of trained assessors who define the sensory attributes (taste, appearance, texture etc.) which best describe products that are being evaluated. Our panel ¹ 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	04 – 06 June 09 – 11 June 30 June – 3 July 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 requirements² (in-house test room and sample serving conditions³).</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 Matzen⁴ 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>

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

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

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

⁴ An unleavened, unsalted bread

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

Sample preparation	All samples are masked by applying correction fluid ⁵ on the visual brand clues. All samples are packed in clear tubes ⁶ 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 ⁷ 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. A comparison for grouping was performed in order to understand key differences of standard Virginia products and new post-EUTPD ones.
Date	21 July 2020

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

⁶ 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/>

⁷ Defined area for below defined threshold: 0 – 15 (scale: 0 – 100)

Please note that the views and arguments presented in this paper have been designed to encourage and stimulate debate and do not necessarily reflect Imperial Tobacco's position

III. Customised Questionnaire for Project Swift

Displayed to Panel (German)	Descriptor (English)	Category
Heu (wenig – viel)	Hay like 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/Haptics
Stranghärte (weich – hart)	Rod hardness	Optics/Haptics
Filterfestigkeit (weich – hart)	Filter firmness	Optics/Haptics
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

UK Consumer Research

Sterling New Dual vs B&H Blue

15th July 2020

JULY 15

Substanceqi
www.substanceqi.com
07725 [REDACTED]



Executive Summary

The objective of the research was to establish whether UK consumers could notice a smell and/or taste other than of tobacco, in particular menthol/mint, in the JTI product Sterling New Dual.

A sample of 120 adult UK smokers were recruited to three central locations to take part in the research. The participants were not told the objective of the research or given any background. Firstly, they smoked the most popular UK cigarette as at the date of the research, B&H Blue, as a benchmark cigarette, followed by Sterling New Dual. Both cigarettes were presented unbranded.

Initially, participants were asked to **smell** the unsmoked cigarette. Using the CATA methodology as recommended by the HETOC report (2016), 34% of participants said that Sterling New Dual had a menthol/mint smell. A significant proportion of participants (68%) identified Sterling New Dual as having a sweetish smell.

The strongest smell identified in the benchmark cigarette, B&H Blue, was hay-like (68%) which is a smell typically associated with tobacco. Just 5% of participants identified a menthol/mint smell when smoking B&H Blue.

After the participants had smoked the cigarettes, a further CATA question set was asked focussing on the **taste** of the cigarette. 78% of the participants said that a menthol/mint taste was noticeable when smoking Sterling New Dual.

By contrast, the taste most identified when smoking B&H Blue was woody, which is a traditional tobacco taste (73%). A very small percentage (3%) of participants identified a menthol/mint taste when smoking B&H Blue.

Project Landscape & Background

Following the ban on Menthol Cigarettes that came into force on 20th May 2020, JTI has launched a new brand 'Sterling New Dual'.

This brand appears to replicate the menthol smoking experience and Imperial Tobacco is concerned that the product may breach the Menthol Ban.

As part of its investigation, Imperial Tobacco has commissioned consumer research in order to determine whether UK consumers can identify a clearly noticeable smell and/or taste other than tobacco, in particular menthol/mint, when smoking Sterling New Dual.

Substance Qi Limited were instructed to conduct a quantified research study to provide data on this issue.

Project Objectives

The key objective of the research was to identify whether consumers identified a clearly noticeable smell and/or taste other than of tobacco, in particular menthol/mint, when smoking 'Sterling New Dual'.

However, it was important that the consumers had no knowledge of the background to the investigation. It was also important that they assessed the smoking characteristics of 'Sterling New Dual' in a strictly controlled, unbranded context thereby ensuring that the focus was on taste and smell of the product rather than any visual characteristics of the cigarette.

It was also necessary to benchmark the product evaluation against a standard non-menthol cigarette. In this case, the benchmark product cigarette selected was the most popular KS cigarette SKU in the UK market as at 24th June 2020, B&H Blue. The benchmark product is manufactured by JTI.

Methodology

The research process needed to be strictly controlled, therefore a Central Location Test was conducted. Test products were kept in a cool environment up until the day of the Test and each individual stick was packed in a sealed plastic tube. The brand name on the cigarette was taped over to reduce visual interference.

Participants were pre-recruited in advance to attend the research locations at specific times. On arrival the format of the Test was explained to participants. No details were given about the background to the investigation or the research objectives.

The format of the Test was as follows:

- Participants were given a single 'Benchmark' cigarette in a sealed clear plastic tube
- Participants were asked to remove the cigarette from the tube and smell it
- They then answered several questions relating to the *smell* of the cigarette (see Research Questionnaire in Appendix)
- They then moved to an outdoor space and smoked the cigarette
- On their return they answered further questions relating to the *taste* (see Research Questionnaire)

- Participants were given a 15-minute rest and offered water

- The process was then repeated for the second cigarette

CATA methodology

The survey was carried out in accordance with the "Check All That Apply" (CATA) methodology whereby participants select all of the flavour attributes that they can taste/smell in the product from a pre-defined list compiled by sensory experts. This method is recommended for use in testing performed by ordinary consumers by the HETOC (2016) report on best practices for identifying characterising flavour in tobacco products.

As recommended by the HETOC report, consumers were asked to go through each taste/smell attribute one-by-one and identify whether the relevant attribute was present or not.

Benchmark

The rationale for selecting a standard (non-menthol) cigarette brand as the benchmark product is that consumers must have a clear reference point against which to assess whether any taste or smell other than tobacco is present. The UK's best-selling standard cigarette brand (B&H Blue) was considered the most appropriate benchmark. This is consistent with the benchmarking approach recommended in the HETOC report.

Sample

A total sample of 120 adult smokers was recruited for this research.

The sample was structured as follows to be representative of the smoker population in general:

- 50% Male
- 50% Female

- 50% 19-29 years
- 50% 30-40 years

- 50% "Full Flavour" smokers (standard tar / nicotine)
- 25% "Lights" smokers (lower tar / nicotine)
- 25% Ex-Menthol smokers (smoked Menthol/Crushball up until the Menthol Ban on 20th May 2020 - which were almost all low TNCO)

- 33% South
- 33% Midlands
- 33% North

In addition, all participants:

- Had been smoking for at least 12 months
- Normally smoked King Size cigarettes
- Smoked at least 5 cigarettes a day on average

Products Tested

Each participant tested the same two products in the same order (unbranded)

Tested First: Benson & Hedges Blue King Size

Tested Second: Sterling New Dual

Benson & Hedges Blue was always tested first to provide a consistent starting point from which to test Sterling New Dual.

Key Findings

Q1/Q8 Does the cigarette have a Likeable Smell (7-point scale)

	B&H Blue	Sterling New Dual
Agree (scores 6-7)	41%	35%
Uncommitted (scores 3-5)	53%	55%
Disagree (scores 1-2)	7%	10%
Mean Scores	5.00	4.65

Reaction to the Likeability of the Smell of each cigarette was very similar. Very few participants were negatively disposed towards the smell of either cigarette. Just over half the participants were relatively ambivalent, with over a third positive towards both cigarettes. Overall B&H Blue scored marginally better but there was not a significant difference.

'Ex-menthol' smokers were most positive towards Sterling New Dual (mean score: 5.37) whilst 'Lights' smokers were most positive towards B&H Blue (mean score: 5.25).

Q2/Q9 Which, if any, of the following Smells are noticeable (Yes/No)

	B&H Blue	Sterling New Dual
	% Answering Yes	% Answering Yes
Hay Like	68%	32%
Sweetish	38%	68%
Chocolate	13%	4%
Put Out Campfire	26%	14%
Menthol/Mint	5%	34%
Vanilla	19%	25%
Citrus/Tropical	3%	41%
Alcohol	3%	23%
Fruity	16%	58%
Caramel	27%	19%
Sourish	9%	23%

There was a significant difference between the two cigarettes on most smell attributes. B&H Blue was associated significantly more with 'Hay Like' (68%) and to a lesser extent with 'Chocolate' and 'Put out Campfire'. These are smell attributes traditionally associated with tobacco.

Sterling New Dual was associated significantly more with 'Sweetish' (68%), Fruity (58%), 'Citrus/Tropical' (41%) and 'Menthol/Mint' (34%).

43% of ex-menthol smokers agreed that Sterling New Dual smelled of 'Menthol/Mint'.

Q3/Q10 In your own words describe your overall impression of the Smell

Spontaneous Description / Adjective	B&H Blue % Mentioning	Sterling New Dual % Mentioning
-		
Normal / Cigarette	39%	-
Strong	21%	11%
Hay	11%	8%
Sweet	11%	19%
Woody	8%	-
Harsh	6%	-
Overpowering	6%	-
Fresh	5%	-
Pleasant	5%	7%
Fruity	4%	22%
Menthol	-	14%
Mint(y)	-	10%

The most common overall impression generated of B&H Blue was that it smelt like a normal cigarette. By comparison there were definite indications that participants were picking up Menthol, Minty, and Fruity cues from Sterling New Dual. Such comments were very limited for B&H Blue.

Q4/Q11 Does the cigarette have an Enjoyable Taste? (7-point scale)

	B&H Blue	Sterling New Dual
Agree (scores 6-7)	27%	32%
Uncommitted (scores 3-5)	60%	42%
Disagree (scores 1-2)	13%	27%
Mean Scores	4.42	4.11

In terms of 'Enjoyable Taste' both cigarettes were more acceptable than particularly liked. Relatively few participants actively disliked the taste of B&H Blue and only 27% were particularly positive. Sterling New Dual was a little more polarising with almost a third of participants positive about the taste but 27% negatively disposed to it.

Again ex-menthol smokers were the most positive about the taste of Sterling New Dual with 53% of them rating it 6 or 7.

Q5/Q12 Which, if any, of the following Tastes are noticeable? (Yes/No)

	B&H Blue	Sterling New Dual
	% Answering Yes	% Answering Yes
Hay Like	47%	23%
Woody	73%	28%
Bitter	35%	34%
Sweetish	21%	45%
Menthol/Mint	3%	78%
Fruity	8%	37%

There was a significant difference between the two cigarettes on every taste attribute except for 'Bitter'. B&H Blue was significantly more associated with the traditional tobacco taste attributes e.g. 'Woody' (78%) and 'Hay Like' (47%), whilst Sterling New Dual was significantly more associated with 'Menthol/Mint' (78%), 'Sweetish' (45%) and 'Fruity' (37%).

Q6/Q13 In your own words describe your overall impression of the Taste

Spontaneous Description / Adjective	B&H Blue	Sterling New Dual
-	% Mentioning	% Mentioning
Strong	41%	-
Normal	33%	-
Harsh	20%	13%
Light	13%	16%
Smooth	13%	8%
Enjoyable	12%	27%
Woody	11%	-
Bitter	8%	8%
Sweet	6%	9%
Hay	4%	-
Menthol	-	54%
Mint(y)	-	23%
Fruity	-	13%
Fresh	-	6%

The range of words used to describe the taste of B&H Blue were consistent with a standard cigarette. There was some division over whether it was 'Strong' or 'Light', 'Harsh' or 'Smooth', but this is a typical spread for an average cigarette.

There was, however, a much more specific reaction to Sterling New Dual taste, with over half the participants using the word menthol (54%) and minty (23%).

Q7/Q14 Does the cigarette have a Satisfying Smoking Experience? (7-point scale)

	B&H Blue	Sterling New Dual
Agree (scores 6-7)	32%	35%
Uncommitted (scores 3-5)	58%	42%
Disagree (scores 1-2)	11%	23%
Mean Scores	4.65	4.29

There was no significant difference between the two cigarettes in terms of 'Satisfying Smoking Experience'. Overall, B&H Blue had the better mean score but this was more to do with Sterling New Dual polarising opinion.

Ex-menthol smokers were the most positive about Sterling New Dual (mean score: 5.23) and the Lights smokers were most positive towards B&H Blue (mean score: 4.97).

Appendix : Research Questionnaire

A. Benchmark Cigarette: B & H Blue KS

Participant to remove cigarette from tube (but not smoke).

Q1. Please smell the cigarette. To what extent do you agree or disagree with the following statement?

	1 Completely disagree	2	3	4	5	6	7 Completely agree
The cigarette has a likeable smell							

Q2. Please indicate which, if any, of the following **smells** are noticeable...

RANDOMISE ORDER, ASK INDIVIDUALLY

	Yes	No
Hay like		

	Yes	No
Sweetish		

	Yes	No
Chocolate		

	Yes	No
Put out campfire		

	Yes	No
Menthol / Mint		

	Yes	No
Vanilla		

	Yes	No
Citrus / Tropical		

	Yes	No
Alcohol		

	Yes	No
Fruity		

	Yes	No
Caramel		

	Yes	No
Sourish		

Q3. In your own words, please describe your overall impression of the **smell** of the product.

--

Participant to now go outside and smoke the cigarette.

Q4. Having smoked the cigarette, to what extent do you agree or disagree with the following statement?

	1 Completely disagree	2	3	4	5	6	7 Completely agree
The cigarette has an enjoyable taste							

Q5. Please indicate which, if any, of the following **tastes** are noticeable...

RANDOMISE ORDER, ASK INDIVIDUALLY

	Yes	No
Hay like		

	Yes	No
Woody		

	Yes	No
Bitter		

	Yes	No
Sweetish		

	Yes	No
Menthol / Mint		

	Yes	No
Fruity		

Q6. In your own words, please describe your overall impression of the **taste** of the product.

--

Q7. To what extent do you agree or disagree with the following statement?

	1 Completely disagree	2	3	4	5	6	7 Completely agree
The cigarette has a satisfying smoking experience							

B. REPEAT FOR TEST CIGARETTE: Sterling New Dual KS