Module 3: Product Description

3.2.4 Product Testing and Analysis Information

TABLE OF CONTENTS

1. FDA 18 TESTING (PROJECT CODE NS531-H) 2

LIST OF TABLES

Table 1: Testing laboratory details 2

Table 2: Sample information 2

Table 3: Ambient conditions according to ISO 3402 (1999) 3

Table 4: Parameters of aerosol-generating regimes 3

Table 5: Summary of results of the FDA 18 HPHCs measured under the Health Canada Intense regime for *IQOS* 3 device aerosol and each of the three currently commercially available *HeatStick*s variants in the U.S. in comparison to their levels in the smoke of the 1R6F reference cigarette 4

Table 6: Summary of results of the FDA 18 HPHCs measured under the ISO Standard regime for *IQOS* 3 device aerosol and each of the three currently commercially available *HeatStick*s variants in the U.S. in comparison to their levels in the smoke of the 1R6F reference cigarette 5

Confidentiality Statement

Data and information contained in this document are considered to constitute trade secrets and confidential commercial information, and the legal protections provided to such trade secrets and confidential information are hereby claimed under the applicable provisions of United States law. No part of this document may be publicly disclosed without the written consent of Philip Morris International.

Once the design of the US version of *IQOS* 3 system was set, the product was tested in independent laboratory for FDA's abbreviated list of 18 Harmful and Potentially Harmful Constituents (HPHCs)[1], which are required under Section 904(a)(3) of the Federal Food, Drug, and Cosmetic Act.

1. FDA 18 TESTING (PROJECT CODE NS531-H)

Testing of 18 HPHCs was performed by independent laboratory Labstat International Inc. The testing laboratory is accredited by the Standards Council of Canada to comply with ISO/IEC 17025:2017.

Table 1: Testing laboratory details

Laboratory name	Labstat International Inc.
Address	262 Manitou Drive, Kitchener, Ontario N2C 1L3, Canada
Telephone no.	+1 (519) 748-5409
Fax no.	+1 (519) 748-1654
E-mail	labstat@labstat.com

Testing was performed on the U.S. commercial version of the *IQOS* 3 System, using all three currently commercialized variants of *HeatSticks*. In addition, reference combustible cigarettes 1R6F were tested as well. No data are provided for the 6 tobacco constituents on the FDA abbreviated list, as the scope of this supplemental PMTA is exclusive of the *IQOS* 3 System. The sample details are provided in the table below.

Table 2: Sample information

Sample Type	Sample ID / Batch no.	Manufacturing date
IQOS 3 System	B-81234	February 5, 2020
Marlboro HeatSticks	B-82173 / 41-3694401	July 16, 2019
Marlboro Smooth Menthol HeatSticks	B-82172 / 41-3684215	July 10, 2019
Marlboro Fresh Menthol Heatsticks	B-82175 / 41-3790725	November 11, 2019
1R6F Kentucky reference cigarette	V062Z53D1	N/A

[1] FDA's Draft Guidance for Industry: Reporting Harmful and Potentially Harmful Constituents in Tobacco Products and Tobacco Smoke Under Section 904(a)(3) of the Federal Food, Drug, and Cosmetic Act, March 2012

Confidentiality Statement

Data and information contained in this document are considered to constitute trade secrets and confidential commercial information, and the legal protections provided to such trade secrets and confidential information are hereby claimed under the applicable provisions of United States law. No part of this document may be publicly disclosed without the written consent of Philip Morris International.

Prior to testing, the *HeatSticks* and Kentucky reference cigarettes were conditioned under the ambient conditions from ISO 3402 (1999) for minimum of 48 hours and up to 10 days. Both mentholated variants of *HeatSticks* were conditioned in sealed packs with overwrap.

Table 3: Ambient conditions according to ISO 3402 (1999)

	Conditioning	Testing
Ambient temperature	22 ± 1°C	22 ± 2°C
Relative humidity	60 ± 3 %	60 ± 5 %

Testing was performed using two aerosol-generating regimes – ISO Standard and Health Canada Intense (HCI) regime. Details of both regimes are provided in the Table 4. However as the *HeatSticks* do not have any ventilation holes, no vent blocking was applied.

Table 4: Parameters of aerosol-generating regimes

	ISO Standard	Health Canada Intense
Puff volume (ml)	35	55
Interval (s)	60	30
Duration (s)	2	2
Vents*	"open"	"fully blocked"
Note: * Health Canada 100% vent blocking method		

For information regarding the analytical methods used to analyze samples please refer to the TPMF no. MF0000243. Corresponding Letter of Authorization (LoA) is provided in section 1.3 *Letters of Authorization*.

Confidentiality Statement

Data and information contained in this document are considered to constitute trade secrets and confidential commercial information, and the legal protections provided to such trade secrets and confidential information are hereby claimed under the applicable provisions of United States law. No part of this document may be publicly disclosed without the written consent of Philip Morris International.

Table 5: Summary of results of the FDA 18 HPHCs measured under the Health Canada Intense regime for *IQOS* 3 device aerosol and each of the three currently commercially available *HeatSticks* variants in the U.S. in comparison to their levels in the smoke of the 1R6F reference cigarette

HPHCs	CAS no.	Unit	*IQOS* 3 System (US commercial version)									1R6F reference cigarette			Analytical method
			Marlboro HeatSticks			*Marlboro Smooth Menthol HeatSticks*			*Marlboro Fresh Menthol HeatSticks*						
			Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	
1,3-butadiene	106-99-0	µg/cig	0.236	0.037	7	0.264	0.035	7	0.258	0.038	7	104	11	7	TMS-00124
1-aminonaphthalene	134-32-7	ng/cig	0.034	0.001	7	0.042	0.004	7	0.051	0.011	7	21.4	0.8	7	TMS-00128
2-aminonaphthalene	91-59-8	ng/cig	< 0.012	NA	7	< 0.012	NA	7	< 0.012	NA	7	13.5	0.9	7	TMS-00128
4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK)	64091-91-4	ng/cig	9.73	1.07	7	8.21	0.65	7	9.38	0.90	7	193	11	7	TMS-00135
4-aminobiphenyl	92-67-1	ng/cig	0.0093	NA	7	0.012	0.003	7	0.010	0.002	7	2.96	0.13	7	TMS-00128
Acetaldehyde	75-07-0	µg/cig	190	12	7	216	28	7	192	8	7	1539	122	7	TMS-00104
Acrolein	107-02-8	µg/cig	9.16	0.88	7	10.1	1.8	7	8.64	0.99	7	172	14	7	TMS-00104
Acrylonitrile	107-13-1	µg/cig	0.141	0.012	7	0.143	0.012	7	0.150	0.012	7	22.4	1.7	7	TMS-00124
Ammonia	7664-41-7	µg/cig	11.4	1.0	7	12.3	0.4	7	11.7	0.3	7	28.7	1.7	7	TMS-00101
Benzene	71-43-2	µg/cig	0.538	0.053	7	0.575	0.060	7	0.586	0.046	7	78.3	6.3	7	TMS-00124
Benzo(a)pyrene	50-32-8	ng/cig	0.491	0.038	7	0.718	0.016	7	0.573	0.019	7	15.9	0.5	7	TMS-00120
Carbon monoxide (CO)	630-08-0	mg/cig	0.423	0.063	20	0.420	0.071	20	0.429	0.056	20	28.7	1.5	20	TMS-00115a
Crotonaldehyde	4170-30-3	µg/cig	3.378	NA	7	< 3.29	NA	7	< 3.29	NA	7	46.7	3.9	7	TMS-00104
Formaldehyde	50-00-0	µg/cig	7.8	0.5	7	8.4	0.6	7	7.5	0.4	7	92.8	13.4	7	TMS-00104
Isoprene	78-79-5	µg/cig	1.68	0.22	7	1.80	0.20	7	1.73	0.10	7	835	70	7	TMS-00124
Nicotine	54-11-5	mg/cig	1.31	0.07	20	1.25	0.07	20	1.28	0.05	20	2.02	0.10	20	TMS-00115a
Nitrosonornicotine (NNN)	16543-55-8	ng/cig	13.9	1.0	7	9.36	1.30	7	9.64	0.72	7	215	10	7	TMS-00135
Toluene	108-88-3	µg/cig	1.67	0.16	7	1.64	0.18	7	1.69	0.17	7	115	9	7	TMS-00124

Legend: SD – standard deviation; n – sample size; "NA" in place of standard deviation indicates the emissions levels for some or all replicates were below the limit of quantification (LOQ) of the analytical method. In these cases, instead of the mean, the median is reported for endpoints classified as being generally quantifiable, and the maximum value is reported for endpoints classified as being generally below the limit of quantification.

Confidentiality Statement

Data and information contained in this document are considered to constitute trade secrets and confidential commercial information, and the legal protections provided to such trade secrets and confidential information are hereby claimed under the applicable provisions of United States law. No part of this document may be publicly disclosed without the written consent of Philip Morris International.

Table 6: Summary of results of the FDA 18 HPHCs measured under the ISO Standard regime for *IQOS* 3 device aerosol and each of the three currently commercially available *HeatSticks* variants in the U.S. in comparison to their levels in the smoke of the 1R6F reference cigarette

HPHCs	CAS no.	Unit	*IQOS* 3 System (US commercial version)									1R6F reference cigarette			Analytical method
			Marlboro HeatSticks			*Marlboro Smooth Menthol HeatSticks*			*Marlboro Fresh Menthol HeatSticks*						
			Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	
1,3-butadiene	106-99-0	µg/cig	< 0.095	NA	7	< 0.095	NA	7	< 0.095	NA	7	34	3	7	TMS-00124
1-aminonaphthalene	134-32-7	ng/cig	< 0.027	NA	7	< 0.027	NA	7	< 0.027	NA	7	12.7	0.7	7	TMS-00128
2-aminonaphthalene	91-59-8	ng/cig	< 0.012	NA	7	< 0.012	NA	7	< 0.012	NA	7	8.7	1.0	7	TMS-00128
4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK)	64091-91-4	ng/cig	4.24	0.29	7	4.16	0.47	7	4.53	0.45	7	78	7	7	TMS-00135
4-aminobiphenyl	92-67-1	ng/cig	0.006	NA	7	0.007	NA	7	0.005	NA	7	1.47	0.06	7	TMS-00128
Acetaldehyde	75-07-0	µg/cig	132	7	7	152	6	7	133	14	7	520	37	7	TMS-00104
Acrolein	107-02-8	µg/cig	3.98	0.39	7	4.7	0.5	7	3.81	0.61	7	51	5	7	TMS-00104
Acrylonitrile	107-13-1	µg/cig	< 0.107	NA	7	< 0.107	NA	7	< 0.107	NA	7	4.8	0.9	7	TMS-00124
Ammonia	7664-41-7	µg/cig	1.8	0.2	7	2.0	0.1	7	2.2	0.3	7	8.1	0.6	7	TMS-00101
Benzene	71-43-2	µg/cig	0.248	0.018	7	0.283	0.022	7	0.284	0.021	7	25.1	4.1	7	TMS-00124
Benzo(a)pyrene	50-32-8	ng/cig	< 0.354	NA	7	0.407	0.075	7	< 0.354	NA	7	6.8	0.2	7	TMS-00120
Carbon monoxide (CO)	630-08-0	mg/cig	0.232	NA	20	0.240	NA	20	0.270	NA	20	9.8	0.8	20	TMS-00115a
Crotonaldehyde	4170-30-3	µg/cig	< 3.29	NA	7	< 3.29	NA	7	< 3.29	NA	7	9.3	1.2	7	TMS-00104
Formaldehyde	50-00-0	µg/cig	4.5	0.3	7	4.9	0.2	7	4.6	0.4	7	28.7	2.7	7	TMS-00104
Isoprene	78-79-5	µg/cig	0.83	0.06	7	0.96	0.08	7	0.97	0.06	7	261	24	7	TMS-00124
Nicotine	54-11-5	mg/cig	0.47	0.04	20	0.52	0.05	20	0.53	0.04	20	0.68	0.04	20	TMS-00115a
Nitrosonornicotine (NNN)	16543-55-8	ng/cig	6.4	0.4	7	4.69	0.46	7	5.33	0.69	7	82	5	7	TMS-00135
Toluene	108-88-3	µg/cig	0.72	0.07	7	0.77	0.08	7	0.78	0.06	7	31	6	7	TMS-00124

Legend: SD – standard deviation; n – sample size; "NA" in place of standard deviation indicates the emissions levels for some or all replicates were below the limit of quantification (LOQ) of the analytical method. In these cases instead of the mean, the median is reported for endpoints classified as being generally quantifiable, and the maximum value is reported for endpoints classified as being generally below the limit of quantification.

For Labstat's study report with datasets please refer to module 7 *Scientific Studies and Analyses*.

Confidentiality Statement

Data and information contained in this document are considered to constitute trade secrets and confidential commercial information, and the legal protections provided to such trade secrets and confidential information are hereby claimed under the applicable provisions of United States law. No part of this document may be publicly disclosed without the written consent of Philip Morris International.