101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

Olerup SSP® HLA-A-B-DR-DQ SSP Combi Tray

Product number:	**101.708-24 – including *Taq* pol.** **101.708-24u – without *Taq* pol.**
Lot number:	**3H8**
Expiry date:	**2021-08-01**
Number of tests:	**24 tests**
Number of wells per test:	**95 +1**
Storage - pre-aliquoted primers:	**dark at -20ºC**
- PCR Master Mix:	**-20ºC**
- Adhesive PCR seals	**RT**
- Product Insert	**RT**

This Product Description is only valid for Lot No. 3H8.

Complete product documentation consists of generic Instructions for Use (IFU), lot specific Product Insert, Worksheet and Certificate.

CHANGES COMPARED TO THE PREVIOUS *OLERUP* SSP® HLA-A-B-DR-DQ COMBI TRAY LOT (6G8)

The **HLA-A low resolution** specificity and interpretation tables have been updated for the HLA-A alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made **(Lot No. 6G8)**. The kit design is based on IMGT/HLA database 3.33.0.

The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Well	5'-primer	3'-primer	rationale
3	Exchanged	-	5'-primer exchanged for the A*03:204 allele.
17	-	Added	3'-primer added for the A*33:135 allele, 3'-primer added for the A*33:141 allele.

The **HLA-B low resolution** specificity and interpretation tables have been updated for the HLA-B alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made **(Lot No. 6G8)**. The kit design is based on IMGT/HLA database 3.33.0.

The primers of the wells detailed below have been exchanged, added or modified compared to the previous lot.

Lot No.: 3H8 **Lot-specific information**

Well	5'-primer	3'-primer	rationale
28	-	Removed	Redundant 3'-primer has been removed.
57	Removed	-	Redundant 5'-primer has been removed.

The **HLA-DR low resolution** specificity and interpretation tables have been updated for the HLA-DRB alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made **(Lot No. 6G8)**. The kit design is based on IMGT/HLA database 3.33.0.

The primers of the wells detailed below have been exchanged, modified or added compared to the previous lot.

Well	5'-primer	3'-primer	rationale
67	-	Added	3'-primer added for the DRB1*15:158 allele.
74	-	Removed	3'-primer removed for improved HLA-specific resolution of the DRB1*08 and DRB1*12 alleles.
83	Added	-	5'-primer added for the DRB1*14:193 allele.
85	Added	-	5'-primer added for the DRB3*02:78 allele. Positive control primer pair was exchanged for improved band separation.
87	Added	-	5'-primer added for the DRB5*01:39 allele.

The **DQ low resolution** specificity and interpretation tables have been updated for the HLA-DQB1 alleles described since the previous *Olerup* SSP® HLA-A-B-DR-DQ Combi Tray lot was made **(Lot No. 6G8)**. The kit design is based on IMGT/HLA database 3.33.0.

The primers of the wells detailed below have been exchanged, modified or added compared to the previous lot.

Well	5'-primer	3'-primer	rationale
89	Added	-	5'-primer added for the DQB1*06:260 allele.
94	Exchanged	-	5'-primer exchanged for decreased tendency of primer oligomer formation.

Changes in revision R01 compared to R00:
1. Primer mix 4 amplifies the A*01:15N allele. This is corrected in the Specificity and Interpretation Tables.
Changes in revision R02 compared to R01:
1. Notes on Bw assignment of HLA-B alleles have been added in the section "Uniquely identified alleles".
Change in revision R03 compared to R02:
1. Primer mix 93 does not amplify the DQB1*03:03:06, 03:06, 03:25:01-03:25:02 and DQB1*04:03:01-04:03:03 alleles. This has been corrected in the specificity and interpretation tables.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

Well **96** contains Negative Control primer pairs, that will amplify more than 95% of the *Olerup* SSP® HLA Class I, DRB, DQB1, DPB1 and DQA1 amplicons as well as all the amplicons generated by the control primer pairs matching the human growth hormone gene.

HLA-specific PCR product sizes range from 75 to 200 base pairs.
The PCR product generated by the positive control primer pair is 430 base pairs.

Length of PCR product	**105**	**200**	**105**	**80**	**75**	**80**	**85**
5'-primer[1]	**164**	**340**	**440**	**45**	**45**	**43**	**36**
	5'-CAC3'	5'-Agg3'	5'-TTA3'	5'-Tgg3'	5'-Tgg3'	5'-Tgg3'	5'-TAC3'
							36
							5'-TAT3'
3'-primer[2]	**231**	**2nd I**	**507**	**59**	**58**	**57**	**47**
	5'-TgC3'	5'-AAA3'	5'-TTg3'	5'-CTC3'	5'-ggC3'	5'-CTC3'	5'-ACA3'
							48
							5'-gCA3'
							48
							5'-gCC3'
							52
							5'-TgT3'
A*	+	+	+				
B*	+	+	+				
C*	+	+	+				
DRB1				+	+		
DRB3				+	+		
DRB5				+			
DQB1					+		
DPB1						+	
DQA1							+

[1]The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon, matching the specificity-determining 3'-end of the primer is given. Nucleotide and codonnumbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.
[2]The nucleotide position for HLA class I genes and the codon for HLA class II genes, in the 2nd or 3rd exon or the 2nd intron, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide and codon numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

PRODUCT DESCRIPTION

HLA-A-B-DR-DQ SSP Combi Tray

CONTENT

The primer set contains 5'- and 3'-primers for grouping the HLA-A*01:01 to A*80:03 alleles into the corresponding serological groups A1 to A80.
The primer set contains 5'- and 3'-primers for grouping the B*07:02 to B*83:01 alleles into the corresponding serological groups B7 to B81 as well as primer pairs for recognizing the Bw4 and Bw6 sequence motifs.
The primer set contains 5'- and 3'-primers for grouping the DRB1*01:01 to DRB1*16:48 alleles into the corresponding serological groups DR1 to DR18 as well as primer pairs for recognizing the DRB3, DRB4 and DRB5 groups of alleles.
The primer set contains 5'- and 3'-primers for grouping the DQB1 alleles into the serological groups DQ2 to DQ9.

Please note that DQB1 amplifications usually are somewhat less pronounced than e.g. DRB and DQA1 amplifications even when using the same DNA preparation and exactly the same experimental procedures.

PLATE LAYOUT

Each test consists of 96 PCR reactions in a 96 well PCR plate.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	NC

The 96 well PCR plate is marked with 'A-B-DR-DQ' in silver/gray ink.
Well No. 1 is marked with the Lot No. '3H8'.
Wells 1 to 21 – HLA-A low resolution primers.
Wells 22 to 64 – HLA-B low resolution primers.
Wells 65 to 87 – HLA-DR low resolution primers.
Wells 88 to 95 – HLA-DQ low resolution primers.
Well 96 – Negative Control.
A faint row of numbers is seen between wells 1 and 2 or wells 7 and 8 of the PCR trays. These stem from the manufacture of the trays, and should be disregarded.
The PCR plates are covered with a PCR-compatible foil.

INTERPRETATION

Only HLA-A alleles will be amplified by the 21 wells of the HLA-A low resolution primer set, **wells 1 to 21**, except that a few HLA-B and HLA-C alleles will be amplified by some primer mixes. For further details see Specificity Table.

Only HLA-B alleles will be amplified by the 43 wells of the HLA-B low resolution, primer set, **wells 22 to 64**, except that a few HLA-A and HLA-C alleles will be amplified by some primer mixes. For further details see Specificity Table.

Only HLA-DRB alleles will be amplified by the 23 wells of the DR low resolution primer set, **wells 65 to 87**. Thus, the interpretation of DR low resolution typings is not influenced by other HLA class II genes.

Only the DQB1 alleles will be amplified by the 8 wells of the DQ low resolution primer set, **wells 88 to 95**. Thus, the interpretation of DQ low resolution typings is not influenced by the DQB2 and DQB3 genes.

UNIQUELY IDENTIFIED ALLELES

All the HLA-A alleles, i.e. **A*01:01 to A*80:03**, recognized by the HLA Nomenclature Committee in July 2018[1,2] will be amplified by the primers in the HLA-A low resolution primer set, **wells 1 to 21**. The HLA-A alleles will be grouped into their corresponding serological specificities[3,4,5].

All the HLA-B alleles, **i.e. B*07:02 to B*83:01**, recognized by the HLA Nomenclature Committee in July 2018[1,2] will be amplified by the primers in the HLA-B low resolution primer set, **wells 22 to 64**. The HLA-B alleles will be grouped into their corresponding serological specificities[3].

Notes on Bw assignment

The Bw4 and Bw6 status of HLA-B alleles is based their serological type:

	Serological Type
Bw4	B5, B5102, B5103, B13, B17, B27, B37, B38(16), B44(12), B47, B49(21), B51(5), B52(5), B53, B57(17), B58(17), B59, B63(15), B77(15)
Bw6	B7, B703, B8, B14, B18, B22, B2708, B35, B39(16), B3901, B3902, B40, B4005, B41, B42, B45(12), B46, B48, B50(21), B54(22), B55(22), B56(22), B60(40), B61(40), B62(15), B64(14), B65(14), B67, B70, B71(70), B72(70), B73, B75(15), B76(15), B78, B81, B82

However, according to the HLA Dictionary[7] there are several exceptions to these associations. This product contains reactions specific to the sequences that code for the Bw4 and Bw6 epitopes. A small number of alleles classified as Bw4 or Bw6 in the HLA Dictionary are not amplified neither by the Bw4 nor the Bw6 primer mix:

Bw Reactivity	Allele
Bw6	B*15:377Q, B*35:01:39, B*35:02:09, B*39:01:15

Lot No.: 3H8 **Lot-specific information**

All the HLA-DRB1, -DRB3, -DRB4 and -DRB5 alleles, i.e. **DRB1*01:01:01 to DRB1*16:48, DRB3*01:01:02:01 to DRB3*03:18, DRB4*01:01:01:01 to DRB4*03:01N, DRB5*01:01:01 to DRB5*02:20**, recognized by the HLA Nomenclature Committee in July 2018[1,2] will be amplified by the primers in the DR low resolution primer set, **wells 65 to 87**. The HLA-DRB alleles will be grouped into their corresponding serological specificities[3].

All the DQB1 alleles, i.e. **DQB1*05:01:01:01 to DQB1*05:161, DQB1*06:01:01 to DQB1*06:275, DQB1*02:01:01 to DQB1*02:106, DQB1*03:01:01:01 to DQB1*03:282N and DQB1*04:01:01 to DQB1*04:50**, recognized by the HLA Nomenclature Committee in July 2018[1,2] will be amplified by the primers in the DQ low resolution primer set. The DQB1 alleles will be grouped into their corresponding serological specificities[6], i.e.:

DQ5(1) =	DQB1*05:01:01-05:05
DQ6(1) =	DQB1*06:01:01-06:33
DQ2 =	DQB1*02:01:01-02:05
DQ3 =	DQB1*03:06, 03:10, 03:14
DQ7(3) =	DQB1*03:01:01-03:01:06, 03:04, 03:09, 03:13, 03:16, 03:19
DQ8(3) =	DQB1*03:02:01-03:02:05, 03:05:01-03:05:04, 03:07-03:08, 03:11, 03:18
DQ9(3) =	DQB1*03:03:02:01-03:03:04, 03:12, 03:15, 03:17, 03:20
DQ4 =	DQB1*04:01-04:02

[1]HLA-A, HLA-B, HLA-DRB and HLA-DQB1 alleles listed on the IMGT/HLA web page 2018-July-11, release 3.33.0, www.ebi.ac.uk/imgt/hla.
[2]Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page http://hla.alleles.org/alleles/deleted.html.
[3]The HLA-A, HLA-B, HLA-C HLA-DRB1, -DRB3, -DRB4 and -DRB5 and the DQB1 alleles will be grouped into their corresponding serological specificities, except that following alleles give rise to identical amplification patterns:

Alleles	Alleles
A*01:26, 01:136, 01:192, A*11:94, 11:112, 11:211, 11:226	B*51:45, 51:81, B*53:44, 53:47
A*01:28, 01:229, A*11:282	B*51:104, 51:118N, 51:147, 51:231, B*52:73, B*58:08:01-58:08:02
A*01:43, A*11:271	B*53:30, B*57:45, 57:51, 57:69
A*03:01:23, 03:08, 03:36N, 03:57, 03:59, 03:72, 03:89:01-03:89:02, 03:107-03:108, 03:111, 03:142, 03:172-03:173, 03:176, 03:178N, 03:198-03:199, 03:203, 03:205, 03:211, 03:252, 03:267, A*24:92	B*55:01:07, 55:02:01:01-55:02:10, 55:07, 55:10, 55:12, 55:16, 55:19, 55:26, 55:30, 55:35, 55:37, 55:39, 55:41-55:43, 55:47-55:48, 55:50, 55:57, 55:61-55:63, 55:65, 55:67, 55:69-55:72, 55:77, 55:80, 55:82-55:83N, 55:88-55:89N, B*56:10
A*03:187, 03:215, 03:225, 03:249, A*25:46	B*55:04, 55:08, 55:13, 55:23, 55:27, 55:32, 55:46, 55:49, 55:81, 55:86, B*56:01:05, 56:15, 56:18-56:19N, 56:22, 56:31-56:32, 56:50
A*11:116, 11:140, 11:199:01-11:199:02, 11:222, A*66:23	B*57:01:01:01-57:01:04, 57:01:06-57:01:22, 57:01:24-57:03:03, 57:05-57:06, 57:08, 57:10, 57:15-57:20, 57:22-57:23, 57:25-57:30, 57:32-57:44, 57:46, 57:48-57:50, 57:52-57:58, 57:60-57:68, 57:70, 57:72-57:81, 57:84-57:87, 57:90-57:92, 57:94-57:100, B*58:36

Lot No.: 3H8 **Lot-specific information**

A*23:01:01:01-23:01:12, 23:01:14-23:13, 23:15-23:56, 23:58-23:63, 23:65, 23:67-23:68, 23:70-23:88, B*18:27	B*57:01:23, 57:89, B*58:01:01:01-58:01:02, 58:01:04-58:01:15, 58:01:17-58:01:24, 58:04-58:05, 58:10N-58:15, 58:19, 58:21-58:24, 58:28:01-58:29, 58:31N-58:35, 58:37, 58:39N-58:42, 58:45:01-58:45:02, 58:47-58:59:02, 58:62-58:63, 58:65-58:72N, 58:74-58:75, 58:77, 58:79-58:83, 58:85-58:93N
A*23:14:01-23:14:02, A*24:24, 24:71, 24:315, 24:392	DRB1*03:126, DRB1*14:179
A*30:01:01:01-30:04:02, 30:06-30:07, 30:09-30:20, 30:22-30:54, 30:56-30:88, 30:90-30:124, 30:126-30:132N, B*07:260	DRB1*08:20, DRB1*13:18, 13:47, 13:55, 13:158, 13:164, 13:232
A*31:08, 31:109, A*33:53, 33:125, 33:131	DRB1*08:31, DRB1*11:05, 11:209
A*68:105, 69:01:01:01-69:01:03, 69:03	DRB1*08:41, 08:75, DRB1*11:67, 11:193:01-11:193:02
B*07:174, 07:202, 07:222, 07:279, B*81:02	DRB1*08:57, 08:80, DRB1*13:248
B*08:26:01-08:26:02, 08:50, 08:62, 08:85, 08:94, 08:146, B*42:07, 42:24	DRB1*13:13, 13:119, 13:154, 13:156, DRB1*14:84, 14:116, 14:144
B*13:04, 13:10, 13:35, 13:59, 13:71-13:72, 13:108, B*44:135, 44:158, 44:184	DRB1*13:44, 13:86, 13:206, DRB1*14:183
B*13:46, B*44:213	DRB1*13:235, DRB1*14:98
B*14:08:01-14:08:02, 14:55, B*39:01:19, 39:25N, 39:30, 39:32-39:34, 39:43, 39:47, 39:50, 39:74, 39:82, 39:102, 39:107, 39:112, 39:128, 39:136	DQB1*03:03:06, 03:06, 03:17:01-03:17:02, 03:23:02, 03:25:01-03:25:02, 03:62, 03:72, 03:78, 03:81, 03:100, 03:110, 03:151, 03:217, 03:225, 03:244, 03:272, 04:03:03
B*18:29, 18:72:01-18:72:03, 18:92, 18:102, B*35:31-35:32:02, 35:37, 35:53N, 35:64:01-35:64:02, 35:68:01-35:68:02, 35:75, 35:99, 35:118-35:119, 35:127, 35:151, 35:174, 35:205, 35:234-35:235, 35:273, 35:292, 35:367, 35:369	DQB1*05:62, DQB1*06:23, 06:156, 06:162, 06:169
B*35:191, B*58:64	

[4]The A*36 alleles will give rise to identical amplification patterns as some A*01 alleles. These alleles can be separated by the A*01 and A*36 high resolution SSP primer sets.
[5]The primers in this kit do not amplify the A*23:66, A*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, 24:324 alleles. These alleles can be amplified by the HLA-A low resolution kit and the A-B-DR kit.
[6]The serological split of the DQB1*05:05-05:161, DQB1*06:06 to 06:07 alleles, the DQB1*06:10, 06:13, 06:15-06:24 and 06:27 to 06:275, the DQB1*02:04-02:106, the DQB1*03:07-03:09 and 03:11-03:282N alleles and the DQB1*04:03:01-04:50 alleles is not known. In this table we have used the expert-assigned serological grouping in Tissue Antigens (2009) 73:95-170, and also inferred the serological grouping from the naming of the sequence-defined allele.
[7]Holdsworth, R Hurley, C K Marsh, S G E Lau, M Noreen, H J Kempenich, J H Setterholm, M Maiers, M: 'The HLA dictionary 2008 : a summary of HLA-A , -B , -C , -DRB1 / 3 / 4 / 5 , and -DQB1 alleles and their association with serologically defined HLA-A, -B, -C, -DR and -DQ antigens', Tissue Antigens, 2009, 73(2), pp. 95-170.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

SPECIFICITY TABLE

HLA-A low resolution primer set

Specificities and sizes of the PCR products of the 21 primer mixes used for HLA-A low resolution SSP typing

Primer Mix	Size of spec. PCR product[1]	Size of control band[2]	HLA-A serology[3]	Amplified HLA-A alleles[4,5]
1[6]	120 bp, 145 bp, 225 bp	**800 bp**	A1, A36	*01:01:01:01-01:04:01:02N, 01:06-01:33, 01:35-01:261, 03:18, 03:135, 11:94, 11:112, 11:211, 11:226, 11:271, 11:282, 26:120, 36:01-36:06
2	175 bp, 215 bp, 255 bp, 365 bp, 415 bp	**800 bp**	A2, A19, A28, A203, A210,	*02:01:01:01-02:01:15, 02:01:17-02:01:19, 02:01:21-02:01:81, 02:01:83-02:22:02, 02:24:01-02:35:01, 02:35:03-02:47, 02:49-02:77, 02:78[w], 02:79:01-02:97:02, 02:99, 02:101:01-02:128, 02:130-02:570, 02:572-02:643N, 02:645-02:740
3[9]	205 bp, 235 bp	1070 bp	A1, A3, A11, A31, A32, A34, A36	*01:12, 01:19, 01:21, 01:126, 01:200, 01:244, 02:338, 03:01:01:01-03:17:02, 03:19-03:74, 03:76-03:94, 03:96-03:134, 03:136-03:176, 03:178N-03:186, 03:188-03:193, 03:195-03:199, 03:201-03:214, 03:216-03:224, 03:226-03:248, 03:250-03:259, 03:261-03:305, 11:03, 11:20, 11:25:01-11:25:02, 11:60, 11:130, 11:158, 11:175, 11:183, 11:209, 24:92, 31:03[w]-31:04[w], 32:04, 33:49[w], 33:144, 34:02:01-34:04, 34:07-34:10N, 34:13, 34:15, 36:02, 68:103:01-68:103:02, 74:23
4	190 bp	**800 bp**	A1, A3, A11, A30, A36, A68	*01:01:01:01-01:01:22, 01:01:24-01:01:47, 01:01:49-01:01:64, 01:01:67-01:01:78, 01:01:80-01:04:01:02N, 01:06-01:07, 01:09:01:01-01:11N, 01:13, 01:15N-01:18N, 01:20-01:29, 01:31N-01:33, 01:35-01:78, 01:80-01:98, 01:100-01:144, 01:146, 01:148, 01:150-01:158, 01:160N-01:166, 01:168-01:177, 01:179N-01:199, 01:201-01:204, 01:206-01:207, 01:209-01:213, 01:215-01:227, 01:229-01:235, 01:237-01:243, 01:245-01:261, 02:78, 02:169, 03:12, 03:18, 03:88, 03:135, 11:01:01:01-11:27, 11:29-11:52Q, 11:54-11:288, 25:43, 26:19, 26:72, 29:67, 30:08, 32:64, 36:04, 66:23, 68:13:01, 68:66:01-68:66:02, 68:134, 68:178, 74:19, **C*03:365, C*12:131**
5	135 bp, 200 bp	**800 bp**	A9, A23, A24, A29, A80	*11:166, 23:01:01:01-23:56, 23:58-23:65, 23:67-23:68, 23:70-23:88, 24:24, 24:71, 24:315, 24:392, 29:07, 29:49, 31:29, 31:85, 32:72, 80:01:01:01-80:03, **B*18:27**
6	175 bp, 205 bp	1070 bp	A2, A3, A9, A23, A24, A26, A2403	*02:17:01[w]-02:17:04[w], 11:139, 23:14:01-23:14:02, 24:02:01:01-24:11N, 24:13:01-24:13:02, 24:17-24:50, 24:54-24:56, 24:58-24:63, 24:66-24:91, 24:93, 24:95-24:113, 24:115-24:137, 24:139-24:187, 24:189-24:210, 24:212-24:221, 24:223-24:227, 24:229-24:290, 24:292-24:295, 24:297-24:303N, 24:305-24:315, 24:317-24:323N, 24:325-24:405, 26:16, 33:19, 33:119, 68:45, 68:117

Lot No.: 3H8 **Lot-specific information**

7	165 bp, 200 bp	**800 bp**	A2, A3, A10, A11, A25, A26, A28, A32, A34, A66, A68, A69	*01:51, 02:55, 02:527, 02:582, 02:644, 03:24, 03:50, 11:10, 11:183, 11:191, 11:269, 25:01:01:01-25:16, 25:18-25:33, 25:35-25:45, 25:47-25:48, 26:01:01:01-26:06, 26:08-26:15, 26:17-26:18, 26:20-26:43:02, 26:45-26:63, 26:65-26:71N, 26:73-26:88, 26:90-26:91, 26:93-26:155, 29:28, 32:15, 33:51, 34:01:01:01-34:17, 66:01:01:01-66:22, 66:24-66:31, 68:01:01:01-68:177, 69:01:01:01-69:03
8[6,7]	80 bp	**800 bp**	A2, A3, A25, A32, A53	*02:81, 02:124, 25:01:01:01-25:45, 25:47-25:48, 32:01:01:01-32:02, 32:04, 32:06-32:37, 32:39-32:59, 32:61-32:70, 32:72-32:77, 32:81-32:106, 32:108-32:110, **B*07:81, B*08:52, B*18:67, B*38:41, B*38:67, B*51:185, B*53:05:01-53:05:02, B*53:16, B*53:33, B*57:60**
9[6,7,10]	80 bp, 240 bp	**800 bp**	A10, A26, A43	*01:43, 01:51, 02:644, 11:17, 11:40, 11:223, 11:271, 26:01:01:01-26:02:02, 26:04, 26:07:01-26:20, 26:22-26:29, 26:31-26:43:02, 26:45-26:77, 26:79-26:91, 26:93-26:110, 26:112-26:155, 29:105, 33:13, 33:48, 43:01, 68:84
10[6, 10]	80 bp, 175 bp	1070 bp	A1, A9, A10, A11, A26, A34, A66	*01:13, 01:26, 01:28, 01:136, 01:176, 01:192, 01:229, 03:63, 03:88, 11:01:01:01-11:27, 11:29-11:52Q, 11:54-11:270, 11:272Q-11:288, 24:19, 24:44, 26:03:01, 26:06, 26:21, 26:78, 26:92, 26:111, 26:152, 30:125, 34:01:01:01-34:08, 34:10N-34:17, 66:01:01:01-66:01:05, 66:04-66:11, 66:13-66:14, 66:17-66:20, 66:22-66:24, 66:27N, 66:29-66:31, 69:02, 80:02
11[6]	125 bp, 165 bp, 190 bp	**800 bp**	A10, A25, A26, A31, A34, A43, A66	*01:01:56, 02:309, 02:454, 03:01:19, 03:103:02, 11:11, 25:05-25:06, 26:09, 26:54, 26:91, 31:03-31:04, 31:123, 34:01:01:01-34:17, 43:01, 66:02-66:03:01:02, 66:16, 66:19, 66:21, 66:25-66:26Q, 66:28N, 68:130:01, 74:01:03
12	175 bp, 225 bp	1070 bp	A1, A2, A3, A10, A25, A26, A34, A43, A66	*01:13, 01:176, 01:194, 02:34-02:35:03, 02:56:01-02:56:02, 02:62, 02:103, 02:135, 02:580, 03:01:01:01-03:01:22, 03:01:24-03:07:02, 03:09-03:11N, 03:13-03:31, 03:33-03:35, 03:37-03:40, 03:42-03:56, 03:58, 03:60-03:71, 03:73-03:87, 03:90-03:106, 03:109-03:110, 03:112-03:141, 03:143-03:151, 03:153-03:171, 03:174-03:175, 03:177, 03:179-03:193, 03:195-03:197N, 03:201-03:202, 03:204, 03:206-03:210, 03:212-03:218, 03:220-03:251, 03:253-03:259, 03:261-03:266N, 03:268-03:272, 03:274-03:305, 11:116, 11:140, 11:199:01-11:199:02, 11:222, 25:01:01:01-25:05, 25:07-25:35, 25:37-25:42N, 25:44-25:48, 26:01:01:01-26:01:47, 26:02:01[w]-26:02:02[w], 26:03:01, 26:05-26:08, 26:10-26:28, 26:29[w], 26:30-26:43:02, 26:45-26:48, 26:49[w], 26:50-26:74, 26:76-26:77, 26:79-26:90, 26:92-26:155, 30:55, 31:24-31:25, 32:26:01-32:26:02, 33:61, 34:08, 43:01, 66:01:01:01-66:01:05, 66:04-66:09, 66:10[w], 66:11-66:15, 66:17-66:20, 66:22-66:24, 66:27N, 66:29-66:31, 68:71, 74:13
13[6,10]	80 bp, 115 bp,	1070 bp	A26, A29, A31, A34, A36, A68	*02:237, 02:309, 02:454, 03:01:38, 03:95, 03:123:02, 03:171, 03:231:01, 11:130, 26:19,

Lot No.: 3H8 **Lot-specific information**

	200 bp, 240 bp, 460 bp			26:22, 29:01:01:01-29:113, 31:03-31:04, 31:123, 32:42, 34:04, 36:02, 66:09, 68:19, 68:130:02
14[6,8,10,11]	90 bp, 135 bp, 205 bp	1070 bp	A1, A30	*01:13, 01:28, 01:176, 01:194, 01:229, 03:43, 03:82, 03:186, 11:113, 11:162, 11:282, 30:01:01:01-30:04:02, 30:06-30:20, 30:22-30:132N, 31:35, **B*07:260**
15	240 bp, 380 bp, 410 bp	1070 bp	A24, A31, A32	*02:237, 03:95, 29:14, 31:01:02:01-31:136, 32:05, 32:79, 33:53, 33:125, 33:131, 74:13
16[11]	140 bp, 180 bp, 235 bp, 260 bp	1070 bp	A1, A3, A25, A32, A74	*01:07, 01:95, 03:32, 03:43, 03:82, 03:152, 03:186, 03:219, 03:273, 23:64, 24:104, 24:243, 25:03, 25:30, 29:13, 29:39, 29:98, 30:89, 31:21, 31:35, 32:01:01:01-32:110, 74:07
17	205 bp, 390 bp	1070 bp	A24, A31, A32, A33, A68, A74	*02:243:01-02:243:03, 24:82, 29:48, 29:105, 31:08, 31:109, 32:05, 32:15, 32:79, 32:93, 33:01:01:01-33:01:11, 33:03:01:01-33:37, 33:39-33:147, 68:29, 74:04, 74:21
18	340 bp, 375 bp	**800 bp**	A2, A19, A68, A74	*01:121, 02:65, 02:407, 02:449, 03:246, 03:282, 32:62, 68:25, 74:01:01-74:28
19[10,11,12]	210 bp, 240 bp	**800 bp**	A2, A25, A28, A68	*02:34-02:35:03, 02:46, 02:48, 02:56:01-02:56:02, 02:62, 02:70, 02:78, 02:103, 02:129, 02:571, 02:580, 02:651, 23:01:13, 24:340, 25:05, 26:54, 26:122, 68:01:01:01-68:104:02, 68:106-68:178
20[6,12]	65 bp, 240 bp, 375 bp, 545 bp	**800 bp**	A2, A26, A28, A32, A66, A68, A69	*02:55, 02:149, 02:243:01-02:243:03, 02:309, 02:644, 23:57, 24:82, 25:30, 26:22, 29:80, 31:41, 32:06, 33:22, 66:06, 66:09, 68:08:02, 68:29, 68:105, 68:157, 69:01:01:01-69:03
21[6,10]	75 bp, 155 bp, 240 bp, 495 bp	**800 bp**	A2, A3, A24, A26, A28, A36, A68, A80	*02:55, 02:237, 02:671, 03:41, 03:63, 03:75, 03:88, 03:95, 03:177, 11:130, 24:18, 24:204, 24:213, 26:03:01, 26:05-26:06, 26:21, 26:30, 26:78, 26:111, 33:24, 36:02, 68:05, 68:15, 68:20, 68:109, 68:136, 80:01:01:01-80:01:01:02, 80:03, **C*06:187**

[1]Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of HLA-A low resolution SSP typings.
When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.
Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers.
PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.
PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.
Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherit feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.
[2]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[3]The serological reactivity of all HLA-A alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

[4]For several HLA Class I alleles 1st and/or 4th exon(s) and beyond, as well as intron nucleotide sequences, are not available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

[5]The A*23:66, A*24:14:01:01-24:15, 24:51-24:53, 24:57, 24:64, 24:94, 24:114, 24:138, 24:188, 24:222N, 24:228, 24:291, 24:296, 24:304, 24:316, and 24:324 alleles will not be amplified by this lot of A-B-DR-DQ. These alleles can e.g. be amplified by the HLA-A low resolution kit and/or the A-B-DR resolution kit.

[6]HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

[7]Primer mixes 8 and 9 may weakly amplify the A*34 alleles.

[8]Primer mix 14 may give rise to a lower yield of HLA-specific PCR product than the other HLA-A low primer mixes.

[9]Primer mix 3 may faintly amplify the A*30:04:01-30:04:02, 30:06, 30:09, 30:17, 30:29, 30:46, 30:77, 30:89-30:90, 30:99, 30:103, 30:105 and 30:117 alleles.

[10]Primer mixes 9, 10, 13, 14, 19 and 21 may have a tendency of giving rise to primer oligomer formation.

[11]Primer mixes 14, 16 and 19 may have tendency of unspecific amplification.

[12]Primer mixes 19 and 20 may generate a false positive band of about 560 base pairs. This band should be disregarded when interpreting HLA-A low resolution typings.

'w', might be weakly amplified.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

SPECIFICITY TABLE

HLA-B low resolution primer set

Specificities and sizes of the PCR products of the 43 primer mixes used for HLA-B low resolution SSP typing

Primer Mix	Size of spec. PCR product[1]	Size of control band[2]	HLA-B serol.[3]	Amplified HLA-B alleles[4]
22[9]	285 bp	**800 bp**	7, 703, 8, 35, 40, 41, 42, 48, 60, 61, 81	*07:02:01:01-07:02:38, 07:02:40-07:06:03, 07:08:01-07:18:02, 07:20-07:32, 07:34-07:39, 07:41-07:52, 07:54-07:59, 07:61-07:76, 07:79-07:83, 07:85-07:99, 07:101-07:121, 07:123-07:138, 07:140-07:164, 07:166-07:192, 07:194-07:195, 07:199-07:213, 07:215-07:234, 07:236-07:238, 07:240-07:254, 07:256-07:316N, 08:01:01:01-08:01:20, 08:01:22-08:01:24, 08:01:26-08:05, 08:07-08:08N, 08:10-08:11, 08:13-08:15, 08:17-08:30N, 08:32-08:83, 08:85-08:88, 08:90-08:102, 08:104-08:106, 08:108-08:112, 08:114-08:115, 08:117-08:133, 08:135-08:168, 08:170-08:174, 08:176-08:183, 08:185-08:196, 15:297, 27:164, 35:66, 35:87, 37:07, 40:15-40:16, 40:30-40:32, 40:34, 40:45, 40:59, 40:80, 40:98, 40:137, 40:160:01-40:160:02, 41:02:01:01-41:02:07, 41:04, 41:10-41:11, 41:13, 41:18-41:19, 41:23-41:24, 41:27, 41:31, 41:36, 41:38-41:43, 41:45N-41:49, 41:51-41:52, 41:55, 42:01:01-42:02:01:02, 42:05:01-42:07, 42:09-42:13, 42:15-42:25, 44:150, 44:166, 48:01:01:01-48:01:06, 48:05-48:12, 48:14-48:20, 48:22, 48:27-48:39, 48:41-48:46, 53:15, 81:01:01-81:08, **C*03:260**
23	215 bp	1070 bp	8, 44	*08:01:01:01-08:05, 08:07-08:25, 08:27-08:49, 08:51-08:61, 08:63-08:64, 08:66-08:84, 08:86N-08:93, 08:95-08:122, 08:124-08:131, 08:133-08:145, 08:147-08:196, 13:93, 15:142, 15:180, 15:429, 35:218, 35:256, 37:62, 40:328, 44:49, 44:156, 49:25, 51:68, 51:176, **C*06:147**
24	140 bp, 235 bp	1070 bp	7, 8, 13, 15, 35, 4005, 44, 49, 50, 61, 62, 77	*07:20, 07:24, 07:60, 07:100, 07:131, 07:220, 07:223, 08:21, 08:25, 08:175, 13:01:01:01-13:04, 13:06-13:08, 13:10-13:23, 13:25-13:38, 13:40-13:57, 13:59-13:66, 13:68-13:96, 13:99-13:111, 15:07:01:01-15:07:03, 15:36[w], 15:45, 15:55, 15:68, 15:89[w], 15:126, 15:197:02, 15:207, 15:324, 15:329, 15:331, 15:360, 15:383, 15:405, 15:431, 15:450, 35:05:01:01-35:05:03, 35:16-35:17:02, 35:22, 35:30, 35:51, 35:58, 35:72, 35:89, 35:97, 35:113-35:114, 35:125, 35:164, 35:199, 35:232, 35:242, 35:318, 35:346, 35:368, 40:05:01:01-40:05:01:02, 40:71, 40:174, 44:08[w], 44:54, 44:57[w], 44:60, 44:106, 44:110, 44:135, 44:158, 44:184, 44:211, 44:213, 46:12, 51:64, 51:148, 53:14, 55:51, 58:18, **C*03:05, C*03:25, C*03:27, C*03:143, C*03:167, C*03:296:01-03:296:02, C*03:335, C*03:346**
25[6,7]	140 bp, 260 bp	**800 bp**	12, 13, 14, 15, 17, 18, 21, 27, 35, 39, 40, 41, 44, 45, 47, 48, 49, 50, 57, 58, 60,	*07:68:01-07:68:03, 07:100, 07:218, 07:220, 07:237, 07:262, 08:71, 08:118, 13:01:01:01-13:01:09, 13:01:11-13:04, 13:06-13:13:02, 13:15-13:23, 13:25-13:57, 13:59-13:82, 13:84-13:92, 13:94-13:96, 13:99-13:101, 13:102[w], 13:103N-13:105, 13:107-13:111, 14:01:01:01-14:02:08, 14:02:10-14:05, 14:07N, 14:09, 14:11-14:36, 14:38-14:54, 14:57-14:61, 15:07:01:01-15:07:03, 15:45-15:46, 15:53, 15:55, 15:68,

Lot No.: 3H8 **Lot-specific information**

			61, 62, 64, 65	15:106, 15:126, 15:197:02, 15:207, 15:212, 15:324, 15:329, 15:331, 15:336, 15:360, 15:383, 15:399, 15:405, 15:431, 15:450, 18:14, 18:44:01-18:44:02, 18:107, 27:32, 27:138, 35:05:01:01-35:05:03, 35:22, 35:46-35:47, 35:51, 35:58, 35:63, 35:66, 35:72, 35:89, 35:97, 35:154, 35:199, 35:207, 35:217, 35:232, 35:317, 35:368, 38:19, 39:03:01:01-39:03:01:02, 39:14:01:01-39:14:01:02, 39:24:01-39:24:02, 39:29, 39:37, 39:76, 39:79, 39:120, 40:01:01-40:01:39, 40:01:42-40:01:50, 40:01:52-40:01:53, 40:07, 40:10:01:01-40:10:02, 40:14:01-40:16, 40:22N-40:23, 40:25, 40:30-40:36, 40:38, 40:42-40:43, 40:45, 40:47-40:49, 40:51-40:55, 40:58-40:63, 40:65-40:67, 40:69, 40:71-40:73, 40:76-40:77, 40:79-40:81, 40:84, 40:87:01-40:88, 40:92, 40:100-40:102, 40:106, 40:108, 40:110, 40:112-40:114:02, 40:116-40:118N, 40:121, 40:123-40:126, 40:128-40:130:02, 40:132, 40:134-40:136, 40:139-40:141, 40:146-40:147, 40:150-40:156, 40:158, 40:160:01-40:160:02, 40:163-40:164, 40:166, 40:168, 40:171-40:172, 40:174-40:175, 40:178-40:179, 40:182-40:183, 40:186:01-40:188, 40:191-40:199, 40:204, 40:207-40:208, 40:212-40:213, 40:215-40:219, 40:221-40:223, 40:227-40:228, 40:231, 40:233-40:242, 40:245, 40:247, 40:249-40:250, 40:252-40:253, 40:257-40:264, 40:272-40:273, 40:277-40:282, 40:285-40:286N, 40:288, 40:298:01-40:301, 40:308, 40:310, 40:312, 40:315-40:316, 40:319, 40:321, 40:323-40:327, 40:329, 40:332-40:333, 40:336, 40:338N-40:339, 40:342, 40:344, 40:346, 40:352-40:353, 40:355, 40:357-40:358, 40:360, 40:367-40:368, 40:370, 41:01:01:01-41:40, 41:42-41:55, 42:10, 42:17, 44:02:01:01-44:02:31, 44:02:33-44:02:39, 44:02:41-44:03:06, 44:03:08-44:03:15, 44:03:17-44:03:18, 44:03:21-44:03:29, 44:03:32-44:05:04, 44:09-44:39, 44:41:01-44:43:02, 44:45-44:56N, 44:58N-44:80, 44:82, 44:84:01-44:102, 44:104-44:110, 44:112-44:129, 44:132-44:133, 44:135-44:144, 44:146-44:155, 44:157-44:193, 44:195N-44:199, 44:201-44:209, 44:211, 44:213-44:223, 44:226-44:230, 44:231[w], 44:232-44:245, 44:247-44:288, 45:01:01-45:21, 45:23, 46:12, 47:01:01:02-47:10, 48:12, 48:14, 48:29, 49:01:01:01-49:02, 49:04:01-49:14, 49:16-49:24, 49:27-49:30, 49:32-49:41, 49:43-49:50, 50:01:01:01-50:02, 50:04-50:06, 50:08-50:20, 50:31-50:33, 50:35-50:42, 50:44-50:55, 51:64, 53:14, 53:30, 54:38, 57:11, 57:45, 57:51, 57:69, 57:71, 57:88, 58:02:01-58:02:02, 58:06-58:07, 58:18, 58:25, 58:38, 58:43, 58:60, **C*01:30, C*01:32:01-01:32:02, C*06:20, C*06:207, C*12:87, C*14:76, C*14:82, C*16:85, C*16:98, C*16:102, C*16:110**
26[7]	185 bp, 235 bp	**800 bp**	7, 16, 17, 27, 2708, 37, 38, 39, 3901, 3902, 64, 67	*07:02:32, 07:197, 14:01:01:01-14:01:05, 14:01:07, 14:07N-14:08:02, 14:10, 14:12, 14:14, 14:19, 14:26, 14:32, 14:40, 14:46-14:47, 14:49, 14:53-14:55, 27:01-27:05:15, 27:05:17-27:05:19, 27:05:21-27:06, 27:07:04, 27:08-27:10, 27:12:01:01-27:13, 27:16-27:18, 27:20, 27:23, 27:26-27:27, 27:29, 27:31, 27:35-27:37, 27:39-27:42, 27:44-27:46, 27:48-27:61, 27:64N-27:69, 27:72-27:75, 27:77-27:80, 27:82-27:124, 27:126, 27:128-27:129, 27:131-27:137, 27:140-27:149, 27:151-27:152, 27:154-27:163, 27:165-27:175, 37:02, 38:01:01:01-38:01:07, 38:01:09-38:02:02, 38:02:04-38:03, 38:07-38:24, 38:26-38:32, 38:34N-38:71, 39:01:01:01-39:01:01:07, 39:01:03:01-39:01:08, 39:01:10-39:02:01, 39:03:01:01-39:03:01:02, 39:05:01:01-39:06:02:04,

				39:06:04-39:09:03, 39:11, 39:14:01:01-39:15, 39:18, 39:19:02, 39:22, 39:24:01-39:39:01, 39:40:01N-39:44, 39:46-39:48, 39:50-39:62, 39:64-39:71, 39:73-39:75, 39:77, 39:79-39:82, 39:84-39:88, 39:90-39:91, 39:93-39:95N, 39:97N-39:98, 39:100, 39:102-39:104, 39:106-39:109, 39:111-39:125, 39:127-39:128, 39:130, 39:132, 39:134-39:136, 47:04-47:05, 48:21, 48:26, 67:01:01, 67:03-67:04, 67:06-67:07
27	190 bp	**800 bp**	7, 14, 35, 38, 39, 44, 47, 57, 62, 65	*07:28, 08:87, 14:02:01:01-14:02:02, 14:02:04-14:02:05, 14:02:07-14:06:02, 14:09, 14:11, 14:13, 14:15-14:18, 14:20, 14:22-14:23, 14:25, 14:27, 14:29-14:31, 14:33-14:39, 14:41N, 14:43-14:45, 14:48, 14:50-14:52, 14:56-14:61, 15:77, 15:189, 15:233, 35:03:17, 35:26, 38:05, 38:33, 39:04, 39:129, 44:16, 44:37:01-44:37:02, 44:64:01-44:64:02, 44:91, 44:132, 44:150, 44:190, 44:268, 44:275, 52:26, 57:04:01-57:04:03, **A*23:31, A*24:106, C*01:115, C*02:97, C*07:231, C*14:79, C*16:10**
28	290 bp	1070 bp	15, 22, 46, 62, 63, 71, 72, 75, 76, 77	*15:01:01:01-15:01:03, 15:01:06-15:02:12, 15:03:03, 15:04:01:01-15:08:02, 15:10:02, 15:11:01-15:11:03, 15:11:05-15:15, 15:17:01:01-15:17:07, 15:19-15:21:01:02, 15:24:01-15:28, 15:30:01:01-15:36, 15:38:01-15:40:02, 15:42-15:46, 15:48, 15:50, 15:55-15:58, 15:60, 15:63, 15:65-15:66, 15:70-15:71, 15:73, 15:75-15:79N, 15:81-15:89, 15:92, 15:94N, 15:96-15:97, 15:101-15:102, 15:104-15:107, 15:109-15:113, 15:116-15:118, 15:120-15:122, 15:125-15:126, 15:128-15:129, 15:135-15:150, 15:152, 15:154-15:155, 15:157, 15:159-15:160, 15:162-15:172, 15:174-15:175, 15:177-15:179:02, 15:181N-15:185, 15:187-15:196, 15:199, 15:201-15:209N, 15:211, 15:213-15:219, 15:223-15:225, 15:227-15:228, 15:230-15:234, 15:236-15:237, 15:239-15:241, 15:244-15:251:02, 15:256-15:262N, 15:264-15:265, 15:267-15:273, 15:276-15:280, 15:283-15:289, 15:291, 15:295-15:305, 15:308-15:310, 15:315-15:322, 15:324-15:328, 15:330-15:334, 15:339-15:346, 15:348-15:350, 15:352-15:353, 15:355-15:361, 15:363:01-15:368, 15:370-15:375N, 15:377Q-15:378, 15:381, 15:383-15:387, 15:390-15:396, 15:398-15:407, 15:409-15:413, 15:415-15:417, 15:419-15:425, 15:428-15:432, 15:437-15:438, 15:440-15:443, 15:446, 15:449-15:450, 46:01:01-46:70, 46:72-46:74, **C*01:73, C*05:01:28, C*07:02:30, C*08:16:02**
29[8]	165 bp, 225 bp, 285 bp, 330 bp	1070 bp	5, 8, 12, 21, 22, 37, 41, 42, 44, 45, 48, 51, 56, 57, 60, 62, 70, 71, 72, 82	*08:01:01:01-08:01:22, 08:01:24-08:05, 08:08N-08:13, 08:15-08:27, 08:29-08:36, 08:38:01-08:48, 08:50-08:73, 08:75-08:76, 08:78, 08:80-08:86N, 08:88, 08:90-08:106, 08:109-08:110, 08:112-08:155, 08:157-08:163, 08:165-08:196, 13:46, 15:03:01:01-15:03:07, 15:09:01-15:10:04, 15:18:01:01-15:18:07, 15:23, 15:29, 15:37, 15:46-15:47:02, 15:49, 15:51-15:54, 15:61-15:62, 15:64:01-15:64:02, 15:69, 15:72, 15:74, 15:80, 15:83, 15:90-15:91, 15:93, 15:98-15:99, 15:103, 15:106, 15:108, 15:114-15:115, 15:119, 15:123-15:124, 15:127, 15:131-15:134, 15:143, 15:151, 15:153, 15:156, 15:158, 15:161, 15:173, 15:176, 15:186, 15:197:01-15:198, 15:200, 15:210, 15:212, 15:220-15:221, 15:226N, 15:229, 15:235, 15:238, 15:242:01-15:243, 15:252-15:253, 15:255, 15:259, 15:263, 15:266, 15:274-15:275:02, 15:281-15:282, 15:290, 15:292-15:294N, 15:306-15:307, 15:311-15:314, 15:323, 15:329, 15:335, 15:337-15:338, 15:351, 15:354, 15:369, 15:379-15:380N, 15:382, 15:388-15:389,

				15:397, 15:414, 15:426-15:427, 15:433, 15:435, 15:439, 15:444-15:445, 15:447-15:448, 35:87, 37:12, 38:30, 40:12, 40:136, 40:231, 40:279, 41:01:01:01-41:03:02, 41:05-41:09, 41:11-41:17, 41:19-41:48, 41:50, 41:53-41:55, 42:01:01-42:02:01:02, 42:04-42:08, 42:10-42:15, 42:17-42:19, 42:21-42:25, 44:14-44:15:01:02, 44:18, 44:20, 44:62, 44:100, 44:166, 44:213, 45:01:01-45:23, 51:08:01:01-51:08:02, 51:20, 51:36, 51:44N, 51:97, 51:141, 51:153, 52:19, 55:20, 55:56, 56:13, 57:09, 82:01:01:01-82:03, **C*03:342, C*07:46, C*07:356, C*07:546, C*12:184, C*15:99, C*16:85**
30[7,8,10]	165 bp, 190 bp, 390 bp	1070 bp	5, 17, 21, 35, 51, 5102, 5103, 52, 56, 62, 63, 70, 78	*13:62, 15:01:02, 15:09:01-15:09:02, 15:16:01:01-15:17:07, 15:67, 15:95, 15:162, 15:168, 15:177, 15:196, 15:208, 15:216, 15:222, 15:230, 15:243, 15:254, 15:268, 15:273, 15:277-15:278, 15:356, 15:361-15:362, 15:396, 15:403, 15:408, 15:411, 15:423-15:424, 15:435, 15:446, 27:153, 35:01:10, 35:04:02, 35:251, 40:26, 40:28, 44:03:40, 44:62, 49:18:01, 50:14, 51:01:01:01-51:01:03, 51:01:05-51:02:03, 51:02:05-51:09:03, 51:11N-51:12, 51:13:02-51:14, 51:16-51:23, 51:24:03-51:24:05, 51:26-51:33, 51:37-51:41N, 51:43-51:44N, 51:46, 51:48-51:61:02, 51:63:01, 51:64-51:80, 51:82-51:91, 51:92:02, 51:94-51:98N, 51:100-51:106:01, 51:107-51:130, 51:132-51:142, 51:145-51:147, 51:149N-51:156, 51:158:01-51:196, 51:198, 51:200-51:219, 51:221-51:224, 51:226-51:236, 52:01:01:01-52:01:04, 52:01:06-52:01:14, 52:01:16-52:13, 52:15-52:24, 52:25:02-52:57, 52:59-52:66, 52:68-52:76, 53:28, 56:05:01-56:06, 56:21, 58:08:01-58:08:02, 78:01:01:01-78:09
31	180 bp	**800 bp**	13, 22, 55, 60	*07:78, 13:01:01:01-13:02:22, 13:07N-13:09, 13:11, 13:14-13:20, 13:22:01-13:23, 13:25, 13:27-13:34, 13:36-13:45, 13:47, 13:49N-13:50, 13:52, 13:54-13:58, 13:60-13:61, 13:63N-13:70, 13:73-13:78, 13:80-13:85, 13:87-13:107, 13:109-13:111, 40:48, 45:10, 49:07, 50:31, 54:26, 55:09, 55:22, 55:24, 59:09
32[5]	90 bp, 105 bp, 195 bp	1070 bp	8, 12, 27, 38, 39, 3902, 44, 45, 48, 60, 70, 71, 72, 82	*07:27, 07:50, 07:219, 08:04:01-08:04:02, 08:17, 08:54:01-08:54:02, 08:110, 13:97, 15:03:01:01-15:03:07, 15:47:01-15:47:02, 15:49, 15:54, 15:61-15:62, 15:64:01-15:64:02, 15:68-15:69, 15:91, 15:98, 15:103, 15:123, 15:127, 15:131-15:132, 15:151, 15:156, 15:158, 15:173, 15:210, 15:220, 15:235, 15:242:01-15:242:02, 15:253, 15:259, 15:266, 15:274, 15:281-15:282, 15:369, 15:379, 15:389, 15:397, 15:444, 15:448, 18:37:01-18:37:02, 18:125, 27:18, 27:29, 35:361, 37:28, 38:03, 39:02:01-39:02:03, 39:08, 39:13:01-39:13:02, 39:23, 39:39:01-39:39:02, 39:49, 39:88, 39:101, 39:105, 39:110, 40:12, 40:46, 40:93, 42:11, 44:10, 44:15:01:01-44:15:01:02, 44:18, 44:40, 44:44, 44:117, 44:130, 44:140, 44:156, 44:210:01-44:210:02, 44:251, 45:01:01-45:03, 45:05-45:07, 45:11-45:23, 48:01:01:01-48:05, 48:07-48:30, 48:32-48:40, 48:42-48:46, 49:20, 50:02, 52:16, 55:18, 56:44, 58:44, 82:01:01:01-82:03, **C*05:102, C*08:93, C*15:25**
33	195 bp	1070 bp	27, 35, 37, 44, 58, 76	*07:27, 07:236, 07:240, 08:126, 08:131, 08:139, 15:12:01-15:12:02, 15:14, 15:19, 15:91, 15:131, 15:161, 15:270, 15:298, 15:304N, 18:54, 18:56, 18:108, 18:132, 35:45, 35:71, 37:01:01:01-37:01:11, 37:01:13-37:09, 37:12-37:13, 37:15-37:21, 37:23-37:28, 37:30N-37:33N, 37:35-37:36, 37:38-37:66, 37:68-37:71, 38:17, 44:17, 44:43:01-44:43:02, 44:144,

Lot No.: 3H8 **Lot-specific information**

				44:230, 44:256, 45:09, 46:17, 53:22, 57:93, 58:07, **A*24:174, C*02:82, C*06:165, C*14:61**
34[5,8]	105 bp, 395 bp, 435 bp	1070 bp	5, 7, 15, 41, 42, 62, 63, 70, 71, 75, 77	*07:04:01-07:04:02, 07:25, 07:146, 08:187, 15:09:01-15:10:04, 15:13:01-15:13:02, 15:16:01:01-15:18:07, 15:21:01:01-15:21:01:02, 15:23-15:24:02, 15:37, 15:44, 15:51-15:52, 15:66-15:67, 15:72, 15:76, 15:80, 15:87, 15:90, 15:93, 15:95, 15:99, 15:101, 15:108, 15:114-15:115, 15:119, 15:124, 15:133-15:134, 15:153, 15:157, 15:161-15:162, 15:168, 15:176-15:177, 15:186, 15:189, 15:196-15:198, 15:200, 15:208, 15:216, 15:221-15:222, 15:226N, 15:229-15:230, 15:238, 15:243, 15:252, 15:254-15:255, 15:263, 15:268, 15:273, 15:275:01-15:275:02, 15:290, 15:292-15:294N, 15:306-15:307, 15:311-15:314, 15:323, 15:329, 15:335, 15:337-15:338, 15:351, 15:354, 15:356, 15:361-15:362, 15:376, 15:380N, 15:382, 15:388, 15:394, 15:396, 15:403-15:404, 15:408, 15:411, 15:414, 15:418, 15:420, 15:423-15:424, 15:426-15:427, 15:433-15:436, 15:439, 15:442, 15:445-15:447, 40:136, 40:231, 40:279, 41:08, 42:05:01-42:05:02, **C*07:335, C*14:62**
35[5]	115 bp, 150 bp	1070 bp	18	*08:176, 18:01:01:01-18:15, 18:17N-18:28, 18:30-18:71, 18:73-18:91, 18:93-18:101, 18:103-18:106, 18:108-18:149, 35:289, 48:28
36[5]	80 bp	1070 bp	7, 27, 2708, 44, 60	*07:73, 08:88, 08:102, 27:01-27:05:22, 27:05:24-27:21, 27:23-27:51, 27:53-27:66N, 27:68-27:74, 27:76-27:139, 27:141-27:175, 38:22, 40:46, 40:93, 44:40, 44:44, 44:130, 44:210:01-44:210:02, 49:26
37[5]	105 bp, 150 bp	**800 bp**	12, 13, 17, 18, 22, 27, 35, 37, 39, 44, 45, 47, 48, 51, 53, 56, 57, 58, 60, 61, 62, 70, 75, 77	*07:137, 07:235, 08:49, 08:60, 08:76, 08:129, 08:181, 13:01:01:01-13:01:14, 13:06-13:07N, 13:12:01-13:13:02, 13:17, 13:20-13:23, 13:25-13:26:02, 13:28-13:29, 13:36, 13:39, 13:43, 13:50-13:52, 13:57, 13:60-13:61, 13:63N, 13:73, 13:76N-13:80, 13:83, 13:86-13:87, 13:90, 13:92, 13:95, 13:106-13:107, 13:109-13:110, 14:10, 15:02:01:01-15:02:12, 15:13:01-15:13:02, 15:20-15:21:01:02, 15:25:01-15:25:03, 15:36, 15:44, 15:62, 15:77, 15:80, 15:85, 15:88-15:89, 15:106, 15:112, 15:121, 15:139, 15:144, 15:154, 15:165, 15:170, 15:194, 15:204, 15:213-15:214, 15:223, 15:240, 15:250, 15:265, 15:271, 15:283, 15:289, 15:291, 15:297, 15:301-15:302N, 15:308, 15:319, 15:325, 15:328, 15:330, 15:341, 15:345, 15:357-15:358, 15:366, 15:374, 15:378, 15:393-15:394, 15:399, 15:402, 15:404, 15:407, 15:418, 15:420, 15:425, 15:437-15:438, 18:22, 18:69, 18:105, 18:149, 27:19, 27:30, 27:127, 27:150, 35:01:01:01-35:04:03, 35:06-35:21, 35:23-35:30, 35:33-35:36, 35:38-35:42:02, 35:45-35:50, 35:52, 35:54-35:57, 35:59:01-35:59:02, 35:61:01-35:63, 35:65Q, 35:69-35:71, 35:74, 35:76-35:78, 35:80-35:85, 35:88, 35:90-35:96, 35:98, 35:100-35:101:02, 35:103-35:113, 35:115-35:116, 35:120-35:126, 35:128-35:134N, 35:136-35:150:02, 35:152-35:173:02N, 35:175-35:184, 35:186-35:198, 35:200-35:204, 35:206-35:231, 35:233, 35:236-35:250, 35:252-35:259, 35:261-35:264, 35:266-35:272, 35:274-35:275, 35:277-35:291, 35:293-35:330, 35:332-35:366, 35:370-35:372, 37:01:01:01-37:01:07, 37:01:09, 37:01:11-37:01:13, 37:03N-37:06:02, 37:08, 37:10-37:43, 37:45-37:50, 37:52-37:71, 38:20:01-38:20:02, 39:42, 40:04, 40:28, 40:30, 40:34, 40:64:01:01-40:64:01:02, 40:68, 40:99, 40:129, 40:137, 40:160:01-40:160:02, 40:343, 41:48, 42:13, 44:02:01:01-44:02:33,

				44:02:35-44:14, 44:16-44:17, 44:19N, 44:21-44:30, 44:32-44:40, 44:42-44:46, 44:48-44:52N, 44:55-44:64:02, 44:66-44:98, 44:101-44:105, 44:107-44:134, 44:136-44:137, 44:139-44:157, 44:159-44:165, 44:167-44:181, 44:183, 44:185-44:191, 44:194-44:196, 44:198N-44:212, 44:214-44:229, 44:231-44:235, 44:237N-44:245, 44:247-44:288, 46:33, 46:67, 48:02:01-48:02:03, 48:25, 50:17, 51:04:01-51:04:02, 51:42, 51:46, 51:56:01-51:56:03, 51:139, 51:186, 51:227, 53:01:01-53:13, 53:15-53:43, 53:45-53:46, 53:48N-53:50, 55:14, 56:09, 56:11-56:12, 57:01:01:01-57:01:04, 57:01:06-57:10, 57:12, 57:14:01-57:20, 57:22-57:30, 57:32-57:46, 57:48-57:81, 57:84-57:100, 58:01:01:01-58:01:02, 58:01:04-58:01:15, 58:01:17-58:01:24, 58:04-58:05, 58:09-58:15, 58:17N, 58:19, 58:21-58:24, 58:28:01-58:29, 58:31N-58:37, 58:39N-58:42, 58:44-58:45:02, 58:47-58:59:02, 58:62-58:93N, 83:01, **C*03:102, C*03:263:01-03:263:02, C*03:317, C*03:382, C*15:24, C*15:126**
38[7,8]	140 bp	1070 bp	8, 18, 22, 35, 39, 78	*07:65, 07:134, 08:32, 08:133, 08:180, 15:202, 15:239, 15:308, 15:376, 18:01:01:01-18:03:01, 18:04:01-18:08, 18:10-18:15, 18:17N-18:36, 18:38-18:47, 18:49-18:53, 18:55-18:65, 18:68-18:106, 18:108-18:124, 18:126-18:135, 18:137-18:149, 35:01:01:01-35:02:08, 35:03:01:01-35:18, 35:20:01-35:24:02, 35:27-35:45, 35:48, 35:50-35:62, 35:64:01-35:72, 35:74-35:153, 35:155-35:197, 35:199-35:206, 35:208-35:209, 35:211-35:216N, 35:218-35:253, 35:255-35:270, 35:272-35:273, 35:275-35:310, 35:312-35:316, 35:318-35:360, 35:362-35:372, 37:05, 37:11, 37:14, 37:29, 37:37, 37:67, 39:19:01-39:19:02, 40:185, 40:209, 40:308, 40:350, 40:365, 45:22, 46:40:01-46:40:02, 56:06, 56:45, 58:64, 78:01:01:01-78:09
39[5,9]	55 bp, 245 bp, 390 bp, 415 bp	1070 bp	5, 15, 48, 60, 62, 63, 70, 71, 72, 75, 76, 77, 82	*15:01:01:01-15:01:04, 15:01:06-15:21:01:02, 15:23-15:40:02, 15:42-15:58, 15:60-15:67, 15:69-15:99, 15:102-15:129, 15:131-15:179:02, 15:181N-15:235, 15:237-15:254, 15:256-15:450, 40:12, 46:50, 82:01:01:01-82:03, **C*03:179, C*06:147, C*14:61, C*16:85**
40[9]	210 bp	**800 bp**	27, 37	*07:27, 07:236, 07:273, 08:49, 08:126, 18:54, 37:01:01:01-37:71, 38:17, **C*07:302**
41	170 bp	**800 bp**	16, 35, 38, 39, 3901, 3902, 67, 72	*08:55, 15:69, 15:186, 15:449, 35:35, 35:276, 38:01:01:01-38:02:05, 38:02:07-38:09, 38:11-38:21, 38:23-38:29, 38:31-38:35, 38:38-38:44, 38:46-38:49, 38:51, 38:53-38:62, 38:64, 38:66-38:69, 38:71, 39:01:01:01-39:01:01:07, 39:01:03:01-39:01:18, 39:01:20-39:20, 39:22-39:24:02, 39:26-39:29, 39:31:01:01-39:31:01:02, 39:35, 39:37-39:42, 39:44-39:46, 39:48-39:49, 39:51-39:73, 39:75-39:81, 39:83-39:101, 39:103-39:106, 39:108-39:111, 39:113-39:127, 39:129-39:135, 40:184, 50:49, 51:101, 52:71, 58:20, 58:84, 67:01:01-67:07, **C*15:51**
42[5]	110 bp	1070 bp	38	*27:07:04, 38:01:01:01-38:01:07, 38:01:09-38:02:02, 38:02:04-38:03, 38:05, 38:08-38:24, 38:26-38:34N, 38:36-38:71, 49:26, 52:01:10, **A*23:01:18, A*25:01:08**
43	395 bp	1070 bp	14, 16, 38, 39, 3901, 61, 64, 65	*07:69, 07:85, 07:180, 07:306, 08:65, 14:01:01:01-14:20, 14:22-14:41N, 14:43-14:48, 14:50-14:56, 14:58-14:61, 38:01:01:01-38:02:07, 38:04-38:05, 38:08-38:25, 38:27-38:53, 38:55Q-38:71, 39:01:01:01-39:01:01:07, 39:01:03:01-39:01:24, 39:03:01:01-39:07, 39:09:01:01-39:09:03, 39:11-39:12, 39:14:01:01-39:15, 39:18-39:19:02, 39:22,

				39:24:01-39:38Q, 39:40:01N-39:48, 39:50-39:57, 39:59-39:62, 39:64-39:82, 39:84-39:87N, 39:90-39:95N, 39:97N-39:98, 39:100, 39:102-39:104, 39:106-39:109, 39:111-39:125, 39:127-39:130, 39:132-39:136, 40:75?, 40:322?, 49:26
44	160 bp, 425 bp	1070 bp	7, 703, 8, 14, 15, 16, 21, 27, 39, 3901, 3902, 40, 41, 42, 45, 48, 50, 51, 54, 60, 61, 64, 65, 67, 70, 73, 81	*07:02:01:01-07:26, 07:28-07:35, 07:37:01-07:37:02, 07:39-07:64, 07:66-07:80, 07:82-07:148, 07:150-07:178, 07:181N-07:191, 07:193-07:194, 07:196-07:218, 07:220-07:235, 07:237-07:256, 07:258-07:270, 07:272N, 07:274-07:316N, 08:01:01:01-08:01:03, 08:01:05-08:01:39, 08:04:01-08:05, 08:07-08:35, 08:37-08:51, 08:53:01-08:77, 08:79-08:116, 08:118-08:125, 08:127-08:130, 08:132-08:135, 08:137-08:138, 08:140-08:146, 08:148N-08:196, 14:01:01:01-14:01:04, 14:01:06-14:02:04, 14:02:06-14:02:07, 14:02:09-14:29, 14:31-14:61, 15:68, 27:14, 27:81, 27:130, 39:01:01:01-39:01:01:07, 39:01:03:01-39:06:04, 39:07-39:20, 39:22-39:24:01, 39:25N-39:103, 39:105-39:136, 40:01:01-40:01:04, 40:01:06-40:01:50, 40:01:52-40:01:53, 40:06:01:01-40:06:04:02, 40:06:06-40:07, 40:09?, 40:14:01?-40:14:02?, 40:14:03, 40:15?, 40:16, 40:18?, 40:21?-40:22N?, 40:23, 40:24?-40:25?, 40:27:02?-40:29?, 40:30-40:32, 40:33?-40:36?, 40:38?, 40:42-40:44, 40:45?-40:46?, 40:48, 40:49?, 40:51-40:54, 40:55?-40:58?, 40:59-40:60, 40:61?-40:63?, 40:65?, 40:66, 40:67?-40:69?, 40:70:01-40:70:02, 40:71?, 40:72:01-40:73, 40:74?, 40:75, 40:77, 40:78?, 40:79, 40:80?-40:82?, 40:83, 40:84?-40:85?, 40:86, 40:87:01?-40:88?, 40:91?-40:92?, 40:93, 40:95?, 40:96, 40:98?, 40:100?-40:102?, 40:103, 40:104?-40:108?, 40:109-40:110, 40:111?-40:112?, 40:113-40:114:01, 40:114:02?-40:116?, 40:118N?-40:121?, 40:123?, 40:124:01, 40:124:02?-40:126?, 40:127, 40:128?-40:130:01?, 40:130:02-40:131, 40:132?-40:134?, 40:136?-40:137?, 40:138-40:140, 40:141?, 40:145?, 40:146-40:148, 40:149?, 40:150, 40:151?, 40:152-40:153, 40:154?, 40:155:01N-40:155:02N, 40:156?, 40:158?, 40:159, 40:160:01?-40:160:02?, 40:161-40:162, 40:163?-40:164?, 40:165, 40:166?, 40:167, 40:168?-40:169?, 40:170-40:172, 40:173?-40:176?, 40:177, 40:178?-40:185?, 40:186:01, 40:186:02?-40:187?, 40:189?, 40:190, 40:191?-40:200?, 40:202?-40:213?, 40:215?-40:228?, 40:230, 40:231?-40:236?, 40:237, 40:238?-40:243?, 40:244-40:245, 40:246?-40:248?, 40:249-40:253, 40:256N, 40:257?, 40:258-40:265N, 40:268-40:270, 40:272-40:273, 40:274?, 40:275, 40:276?, 40:277-40:278, 40:279?-40:280?, 40:282?-40:283?, 40:285-40:286N, 40:287?-40:291N?, 40:293?, 40:294-40:295, 40:297?, 40:298:01-40:298:02, 40:299?-40:300?, 40:301, 40:306-40:307, 40:308?, 40:310?, 40:311, 40:312?, 40:313, 40:315?, 40:316-40:318, 40:319?, 40:321, 40:322?, 40:323, 40:324?-40:329?, 40:330, 40:331?, 40:332, 40:333?, 40:336?-40:339?, 40:340-40:342, 40:343?, 40:346, 40:348-40:350, 40:351?-40:352?, 40:354-40:355, 40:357?-40:360?, 40:361N-40:364, 40:365?, 40:367-40:368, 40:370, 41:01:01:01-41:45N, 41:47-41:55, 42:01:01-42:02:01:02, 42:04-42:21, 42:23-42:25, 45:01:01-45:23, 48:01:01:01-48:17, 48:19-48:46, 50:01:01:01-50:02, 50:04-50:20, 50:31-50:55, 51:01:09, 51:01:21, 51:01:25, 51:10, 51:24:02-51:24:04, 51:197, 51:217, 52:54, 54:11, 56:20:02, 67:01:01-67:07, 73:01-73:02, 81:02, **C*05:152, C*07:463**

Lot No.: 3H8 **Lot-specific information**

45[12]	180 bp	1070 bp	15, 40, 44, 48, 60, 62, 71	*15:116, 15:124, 15:352, 15:412, 27:125, 35:230, 35:331, 38:63, 40:01:01-40:01:06, 40:01:08-40:01:17, 40:01:19-40:01:50, 40:01:52-40:01:53, 40:07, 40:10:01:01-40:10:02, 40:12, 40:21-40:23, 40:25, 40:30, 40:33-40:34, 40:36, 40:38, 40:42-40:43, 40:46-40:49, 40:51-40:52, 40:54-40:55, 40:59-40:63, 40:65-40:67, 40:69, 40:73-40:74, 40:76, 40:79, 40:81, 40:84, 40:87:01-40:88, 40:92, 40:100-40:102, 40:106, 40:108, 40:112-40:114:02, 40:116-40:118N, 40:123-40:126, 40:128, 40:130:01-40:130:02, 40:132, 40:134-40:135, 40:137-40:141, 40:146-40:147, 40:149-40:156, 40:160:01-40:160:02, 40:163, 40:166, 40:168, 40:170-40:172, 40:175, 40:178-40:179, 40:182-40:183, 40:185-40:188, 40:191, 40:193-40:196, 40:198-40:199, 40:204, 40:207-40:208, 40:210, 40:212-40:213, 40:215-40:218, 40:221-40:223, 40:227-40:228, 40:231, 40:234-40:236, 40:238-40:242, 40:245, 40:247, 40:249-40:253, 40:257-40:265N, 40:272-40:273, 40:277-40:282, 40:285-40:286N, 40:288, 40:299-40:301, 40:308, 40:310, 40:312, 40:315, 40:319, 40:321, 40:323-40:329, 40:332-40:333, 40:336, 40:338N-40:339, 40:344, 40:346, 40:352-40:353, 40:355, 40:357-40:358, 40:360, 40:365, 40:367-40:368, 40:370, 44:31, 44:169, 44:182, 46:06, 46:43, 48:03:01-48:03:02, 48:17, 48:23, 48:40, 57:59, **C*03:129, C*03:234, C*05:136, C*17:16**
46[5]	105 bp	1070 bp	7, 8, 22, 41, 42	*07:04:01-07:04:02, 07:25, 07:146, 08:01:01:01-08:01:24, 08:01:26-08:05, 08:07-08:12:03, 08:14-08:19N, 08:21-08:24, 08:26:01-08:30N, 08:32-08:39, 08:41-08:54:02, 08:56:01-08:69, 08:71-08:78, 08:80-08:102, 08:104-08:112, 08:114-08:133, 08:135-08:142, 08:144-08:155, 08:157-08:168, 08:170, 08:172-08:174, 08:176-08:196, 35:87, 40:136, 40:231, 40:279, 41:01:01:01-41:08, 41:10-41:28, 41:30-41:31, 41:33-41:55, 42:01:01-42:02:01:02, 42:04-42:07, 42:09-42:18, 42:20-42:25, 44:166, 55:20
47	325 bp	**800 bp**	7, 15, 22, 27, 2708, 35, 42, 45, 46, 54, 55, 56, 67, 73, 78, 81, 82	*07:02:01:01-07:02:55, 07:04:01-07:07, 07:09-07:15, 07:17-07:26, 07:28-07:31, 07:33:01-07:36, 07:39-07:46, 07:47[w], 07:48-07:49N, 07:51-07:68:03, 07:70-07:84, 07:86-07:179, 07:181N-07:206, 07:208-07:218, 07:220-07:227, 07:229-07:231N, 07:233-07:305, 07:307-07:316N, 08:123, 08:132, 14:21, 14:57, 15:76, 15:101, 15:255, 27:01-27:11, 27:13-27:15, 27:17, 27:19-27:21, 27:24-27:28, 27:30-27:38, 27:40-27:58, 27:60-27:76, 27:78-27:91, 27:93-27:118, 27:120-27:128, 27:130-27:136, 27:138-27:152, 27:154-27:175, 35:76, 35:186, 35:229, 35:368, 37:60, 38:26, 40:166, 42:01:01-42:02:01:02, 42:04-42:06, 42:08-42:10, 42:12-42:23, 42:25, 44:90, 44:97, 45:06, 46:01:01-46:01:25, 46:02[w], 46:03-46:40:02, 46:42-46:48, 46:50-46:74, 54:01:01-54:29, 54:31-54:38, 55:01:01-55:05, 55:07-55:17, 55:19-55:77, 55:79-55:89N, 56:01:01:01-56:16, 56:18-56:22, 56:24-56:32, 56:34-56:41, 56:43, 56:45-56:53, 56:55:01:02-56:57, 67:01:01-67:07, 73:01-73:02, 81:01:01-81:08, 82:01:01:01-82:03, 83:01
48[5,7]	80 bp, 115 bp, 160 bp, 195 bp, 225 bp, 260 bp	1070 bp	12, 35, 37, 44, 45, 47, 48, 57	*08:49, 08:60, 08:76, 08:87, 08:129, 08:181, 27:127, 35:38, 35:45, 35:71, 35:115, 35:169, 35:260, 35:309, 37:01:01:01-37:01:07, 37:01:09, 37:01:11-37:01:13, 37:03N-37:06:02, 37:08, 37:10-37:38, 37:41-37:43, 37:45-37:50, 37:52-37:65, 37:67-37:71, 40:132, 40:178, 40:231, 40:279, 41:48, 42:13, 44:02:01:01-44:14, 44:16-44:17, 44:19N-44:36, 44:38-44:63,

				44:65-44:134, 44:136-44:149N, 44:151-44:157, 44:159-44:165, 44:167-44:183, 44:185-44:212, 44:214-44:229, 44:231-44:235, 44:237N-44:245, 44:247-44:267N, 44:269-44:274, 44:277-44:288, 48:11, 51:42, 53:22, 57:07, 57:09, 57:24, 57:93, 83:01, **C*15:25**
49	130 bp, 280 bp	**800 bp**	7, 17, 18, 22, 35, 37, 40, 46, 51, 53, 60, 62, 78	*07:12, 07:14, 07:18:01-07:18:02, 07:137, 07:162-07:163, 07:199, 07:225, 07:227, 07:248, 14:10, 15:57[w], 15:289, 15:297, 15:318, 18:22, 18:69, 18:105, 18:149, 35:21, 35:24:01-35:24:02, 35:81, 35:96, 35:109, 35:157, 35:188, 35:190, 35:233, 35:287, 37:04:01-37:04:02, 40:28, 40:30, 40:34, 40:59, 40:137, 40:160:01-40:160:02, 44:150, 44:190, 44:203, 44:275, 46:01:01-46:39, 46:41N-46:46, 46:48-46:71, 46:73-46:74, 48:17, 51:04:01-51:04:02, 51:46, 51:56:01-51:56:03, 51:139, 51:227, 53:02, 53:06, 53:28, 57:14:01-57:14:02, 58:09, 58:76, **C*01:73, C*03:260, C*03:384, C*15:39, C*15:130**
50[5]	90 bp, 410 bp	1070 bp	7, 15, 22, 27, 2708, 35, 47, 54, 55, 56, 78, 81, 82	*07:65, 27:01[w], 27:02:01:01-27:11, 27:13-27:15, 27:17, 27:19-27:21, 27:24-27:28, 27:30-27:38, 27:40-27:58, 27:60-27:76, 27:78-27:91, 27:93-27:118, 27:120-27:128, 27:130-27:136, 27:138-27:152, 27:154-27:175, 35:76, 35:186, 35:229, 35:368, 37:60, 44:90, 44:97, 47:01:01:02-47:03, 47:06-47:10, 54:01:01-54:29, 54:31-54:38, 55:01:01-55:05, 55:07-55:17, 55:19-55:77, 55:79-55:89N, 56:01:01:01-56:16, 56:18-56:22, 56:24-56:32, 56:34-56:41, 56:43, 56:45-56:53, 56:55:01:02-56:57, 81:01:01-81:01:02, 81:05, 82:01:01:01-82:03, 83:01, **C*14:79**
51[5]	90 bp, 175 bp	1070 bp	15, 27, 35, 48, 60, 62, 75, 77, 81	*07:174, 07:202, 07:222, 07:279, 13:36, 15:02:01:01-15:02:12, 15:08:01-15:08:02, 15:11:01-15:11:07, 15:13:01-15:13:02, 15:15, 15:21:01:01-15:21:01:02, 15:31, 15:44, 15:55, 15:76[w], 15:88-15:89, 15:112, 15:121, 15:139, 15:144, 15:148, 15:170, 15:189, 15:191, 15:194, 15:209N, 15:213-15:215, 15:223, 15:265, 15:283-15:284, 15:291, 15:297, 15:301-15:303, 15:305, 15:319, 15:325, 15:328, 15:330, 15:341, 15:345, 15:350, 15:357-15:358, 15:367, 15:374, 15:378, 15:384, 15:394, 15:399, 15:404, 15:418, 15:420, 15:425, 15:437-15:438, 27:24, 35:46, 35:311, 40:31, 40:45, 40:80, 48:01:01:01-48:01:06, 48:04:01-48:04:02, 48:06-48:07, 48:09, 48:11, 48:15-48:16, 48:18-48:20, 48:22, 48:24, 48:27-48:39, 48:41-48:46, 56:39[w], 81:01:01-81:08
52[5]	105 bp, 145 bp, 395 bp, 430 bp	1070 bp	44, 49, 59, 60, 61	*15:143, 40:13, 40:19, 40:61, 40:109, 40:117, 40:292, 40:340, 41:46, 44:18, 44:25, 44:50:01, 44:95, 49:01:01:01-49:01:12, 49:04:01-49:14, 49:16-49:25, 49:27-49:50, 51:112, 53:30, 53:39, 54:12, 56:21, 56:42, 56:54, 57:45, 57:51, 57:69, 59:01:01:01-59:07, 59:09-59:10N
53[5]	120 bp, 210 bp	**800 bp**	5, 13, 15, 17, 22, 35, 45, 49, 50, 51, 5102, 5103, 52, 55, 56, 62, 63, 78	*07:78, 07:84, 13:16, 13:31[w], 13:48, 13:62, 14:37, 15:04:01:01[w]-15:04:04[w], 15:16:01:01-15:16:03, 15:42, 15:67, 15:95, 15:137[w], 15:254, 15:293, 15:303[w], 15:310, 15:362, 15:408, 27:153, 35:265[w], 40:95, 40:148, 40:161, 46:32[w], 49:01:01:01-49:01:01:03, 49:01:03-49:10, 49:12-49:14, 49:16-49:44, 49:46, 49:48-49:50, 50:01:01:01-50:02, 50:04-50:11, 50:13-50:16, 50:18-50:20, 50:31-50:46, 50:47[w], 50:48, 50:50, 50:52-50:55, 51:01:01:01-51:03, 51:05, 51:07:01-51:09:03, 51:11N-51:14, 51:16-51:24:05, 51:26-51:41N, 51:43-51:44N, 51:48-51:55, 51:57-51:58, 51:60-51:61:02, 51:63:01-51:63:02, 51:65-51:80, 51:82-51:134, 51:136-51:138, 51:140-51:147, 51:149N-51:156, 51:158:01-51:193, 51:195-51:212, 51:214-51:219, 51:221-51:226,

				51:228-51:236, 52:01:01:01-52:76, 54:20, 54:33[w], 55:01:01-55:01:06, 55:01:08-55:01:16, 55:03, 55:05, 55:09, 55:11, 55:15, 55:17, 55:21[w], 55:24-55:25, 55:28-55:29, 55:31, 55:33, 55:36, 55:38, 55:40, 55:44-55:45, 55:52-55:55N, 55:58-55:60, 55:64, 55:66, 55:68, 55:73-55:76, 55:78-55:79, 55:84-55:85, 55:87, 56:05:01-56:06, 56:21, 56:25, 56:37, 58:08:01-58:08:02, 78:01:01:01-78:09, **C*05:152, C*12:183[w], C*14:92**
54	430 bp	1070 bp	5, 17, 27, 44, 51, 5102, 5103, 52, 53, 57, 58, 61	*18:67, 18:136, 27:02:01:01-27:02:04, 27:30, 27:53, 27:57, 27:62, 27:65N, 27:75, 27:77, 27:83, 27:95, 27:102, 27:119, 27:126, 27:134, 27:157, 27:163, 27:171-27:172, 37:34, 40:13, 40:19[?], 40:109[?], 40:292[?], 40:340[?], 44:06, 44:25, 44:50:01, 44:95, 51:01:01:01-51:01:39, 51:01:41-51:24:05, 51:26-51:46, 51:48-51:53, 51:55-51:77, 51:79-51:236, 52:01:01:01-52:01:28, 52:01:30-52:19, 52:21:01-52:76, 53:01:01-53:02, 53:04-53:08:02, 53:10, 53:14-53:30, 53:32-53:35, 53:37, 53:39-53:50, 57:01:01:01-57:04:02, 57:05-57:11, 57:13-57:100, 58:01:01:01-58:02:02, 58:04-58:16:02, 58:18-58:29, 58:31N-58:63, 58:65-58:93N
55	145 bp	1070 bp	12, 21, 35, 4005, 41, 45, 47, 50, 60, 61	*07:133, 08:155, 15:46, 15:53, 15:106, 15:143, 15:212, 18:48, 18:107, 35:19, 35:47, 35:63, 35:154, 35:217, 35:274, 35:317, 39:69, 40:01:01-40:01:50, 40:01:52-40:11:02, 40:14:01-40:16, 40:18, 40:20:01:01-40:20:01:02, 40:22N-40:40, 40:42-40:45, 40:48-40:75, 40:77-40:92, 40:94-40:95, 40:97-40:108, 40:111-40:116, 40:118N-40:136, 40:138-40:156, 40:158-40:184, 40:186:01-40:187, 40:189-40:200, 40:202-40:207, 40:210-40:264, 40:266-40:291N, 40:293-40:307, 40:309-40:339, 40:341-40:349, 40:351-40:364, 40:367-40:371, 41:01:01:01-41:04, 41:06-41:25, 41:27-41:45N, 41:47-41:55, 44:09, 44:46, 44:75, 44:90, 44:129, 44:131, 44:254, 44:277, 45:01:01-45:15, 45:17-45:21, 45:23, 47:02, 47:03[w], 48:41, 50:01:01:01-50:02, 50:04-50:05, 50:07-50:20, 50:31-50:55
56[8]	300 bp	1070 bp	7, 12, 13, 15, 17, 18, 21, 27, 2708, 35, 37, 38, 39, 3902, 4005, 40, 41, 44, 45, 47, 48, 49, 50, 52, 60, 61, 62, 70, 72, 76	*07:54, 07:123, 08:17, 08:38:01-08:38:02, 08:54:01-08:54:02, 08:101, 13:01:01:01-13:04, 13:06, 13:08-13:23, 13:25-13:35, 13:37-13:111, 15:01:01:01-15:01:04, 15:01:06-15:01:18, 15:01:20-15:01:43, 15:03:01:01-15:03:04, 15:03:06-15:07:03, 15:12:01-15:12:02, 15:14, 15:19-15:20, 15:24:01-15:27:04, 15:30:01:01-15:30:01:02, 15:32:01-15:36, 15:38:01-15:40:02, 15:42-15:43, 15:45-15:50, 15:53-15:54, 15:56-15:58, 15:60-15:63, 15:65-15:66, 15:68-15:71, 15:73-15:75, 15:77-15:79N, 15:81-15:87, 15:91-15:92, 15:94N, 15:96-15:98, 15:101-15:107, 15:109-15:111N, 15:113, 15:116-15:118, 15:122-15:123, 15:125-15:129, 15:131-15:132, 15:135-15:138, 15:140-15:142, 15:145-15:147, 15:150-15:152, 15:154-15:160, 15:163-15:167, 15:169, 15:171-15:175, 15:178-15:179:02, 15:181N-15:185, 15:187-15:188, 15:190N, 15:192-15:193, 15:195, 15:199, 15:201-15:207, 15:210-15:212, 15:217-15:220, 15:224-15:225, 15:227-15:228, 15:231-15:237, 15:239-15:245Q, 15:247-15:251:02, 15:253, 15:255-15:262N, 15:264, 15:266-15:267, 15:269-15:272N, 15:274, 15:276-15:282, 15:286-15:289, 15:295-15:296, 15:298-15:300, 15:304N, 15:309-15:310, 15:315-15:318, 15:320-15:322, 15:324, 15:326-15:327, 15:331-15:334, 15:336, 15:339-15:340, 15:342-15:344, 15:346-15:349:02, 15:352-15:353, 15:355, 15:359-15:360, 15:363:01-15:366, 15:368-15:373, 15:375N-15:377Q, 15:379, 15:381, 15:383,

				15:385-15:387, 15:389-15:391, 15:393, 15:395, 15:397-15:398, 15:400N-15:402, 15:405-15:407, 15:409-15:410, 15:412-15:413, 15:415-15:417, 15:419, 15:421-15:422, 15:429-15:432, 15:440-15:444, 15:448-15:450, 18:12:01-18:12:02, 27:01-27:21, 27:24-27:91, 27:93-27:108, 27:110-27:156, 27:158-27:175, 35:10, 35:13, 35:16, 35:28, 35:63, 35:69, 35:80, 35:207, 35:226, 35:270, 35:317-35:318, 35:361, 37:01:01:01-37:07, 37:09-37:66, 37:68-37:71, 38:03-38:04, 38:25, 39:02:01-39:02:03, 39:08, 39:13:01-39:13:02, 39:22-39:23, 39:49, 39:101, 39:105, 39:110, 40:01:01-40:01:50, 40:01:52-40:07, 40:09-40:16, 40:18-40:24, 40:26-40:40, 40:42-40:67, 40:70:01-40:105, 40:107-40:165, 40:167-40:231, 40:233-40:312, 40:314-40:356, 40:358-40:365, 40:367-40:371, 41:01:01:01-41:55, 42:11, 44:02:01:01-44:02:21, 44:02:23-44:03:35, 44:03:37-44:05:04, 44:07-44:11, 44:13-44:170, 44:172-44:231, 44:233-44:245, 44:247-44:262, 44:264-44:288, 45:01:01-45:21, 45:23, 47:01:01:02-47:10, 48:01:01:01-48:05, 48:07-48:15, 48:17-48:38, 48:40-48:46, 49:01:01:01-49:14, 49:16-49:25, 49:27-49:50, 50:01:01:01-50:02, 50:04-50:14, 50:16-50:20, 50:31-50:55, 52:01:01:01-52:72, 52:74-52:76, 53:17:01-53:17:02, 53:28, 53:38, 54:35, 55:18, 55:34, 55:40, 78:05-78:06
57[7,11]	160 bp, 370 bp	1070 bp	22, 44, 45, 47, 54	*08:87, 27:127, 41:55, 44:02:01:01-44:02:50, 44:06, 44:08-44:09, 44:11-44:12, 44:16, 44:19N-44:24, 44:27:01-44:27:03, 44:33-44:34:02, 44:41:01-44:41:02, 44:44, 44:48-44:49, 44:52N-44:53:02, 44:55, 44:59:01-44:59:02, 44:63, 44:66-44:68, 44:71-44:74, 44:80, 44:83-44:84:02, 44:86-44:87, 44:89-44:91, 44:93, 44:95, 44:97, 44:99-44:102, 44:104, 44:106, 44:112-44:113, 44:116, 44:118-44:119, 44:121, 44:126:01-44:127, 44:131-44:132, 44:137-44:138Q, 44:142, 44:145, 44:148-44:149N, 44:151-44:152, 44:162, 44:168-44:173, 44:176-44:177, 44:179, 44:185, 44:187, 44:190-44:191, 44:195N-44:196, 44:200-44:201, 44:206, 44:208, 44:211-44:212, 44:214, 44:216, 44:218-44:221, 44:225, 44:229, 44:235, 44:238, 44:240-44:244, 44:249, 44:253-44:255, 44:257, 44:260-44:262, 44:265, 44:267N, 44:269-44:270, 44:273-44:274, 44:279, 44:287, 54:01:01-54:38, 83:01
58	180 bp, 210 bp	1070 bp	13, 15, 18, 35, 39, 40, 54, 55, 56, 59, 78	*07:65, 07:206, 08:26:03, 13:06, 13:53, 14:37, 15:32:02, 15:42, 15:86, 15:224, 18:04:01, 18:125, 35:08:05, 35:42:02, 35:60, 35:185, 39:17, 39:63, 40:01:11, 40:58, 45:08, 46:18, 46:40:01, 50:45, 50:49, 51:157, 54:01:01-54:02, 54:05N, 54:07-54:08N, 54:10, 54:12-54:13, 54:17-54:25, 54:27-54:32, 54:34-54:38, 55:01:01-55:03, 55:05, 55:07, 55:10-55:12, 55:15-55:16, 55:18-55:19, 55:21, 55:25-55:26, 55:29-55:31, 55:33-55:45, 55:47-55:48, 55:50, 55:52-55:57, 55:59-55:67, 55:69-55:80, 55:82-55:85, 55:87-55:89N, 56:05:01, 56:06, 56:10, 56:23, 56:54, 59:01:01:01-59:01:01:02, 59:05-59:08, 59:10N, 78:01:01:01-78:01:02, 78:02:02-78:03, 78:07-78:09, **C*01:90, C*07:536, C*15:91, C*15:128**
59	180 bp, 205 bp	1070 bp	7, 12, 15, 21, 22, 44, 45, 49, 50, 56, 61, 62, 82	*07:29, 07:186, 08:123, 08:132, 13:03, 13:48, 15:73, 15:303, 40:71, 44:10, 44:15:01:01-44:15:01:02, 44:18, 44:140, 45:01:01-45:01:03, 45:04-45:07, 45:11-45:23, 46:11, 49:01:01:01-49:01:07, 49:01:09-49:03, 49:06, 49:08-49:14, 49:16-49:17, 49:19N-49:49, 50:01:01:01-50:02, 50:04-50:08, 50:10-50:13, 50:15-50:19, 50:32, 50:34-50:38, 50:40-50:44, 50:46-50:48, 50:50-50:55, 51:15, 51:62,

				51:106:01-51:106:02, 51:223, 51:225, 52:25:01-52:25:02, 54:03, 54:33, 56:01:01:01-56:01:04, 56:01:06-56:02:02, 56:04:01-56:04:02, 56:07-56:08, 56:13-56:14, 56:16-56:17, 56:20:01-56:20:02, 56:24-56:30, 56:33-56:49, 56:51-56:53, 56:55:01:02-56:57, 58:73, 59:04, 82:01:01:01-82:03, **C*03:19, C*03:102**
60[5]	90 bp, 240 bp	**800 bp**	57	*08:181, 55:14, 57:01:01:01-57:01:22, 57:01:24-57:04:01, 57:04:03-57:44, 57:46-57:50, 57:52-57:68, 57:70-57:88, 57:90-57:100, 58:36, **C*06:72**
61[5]	95 bp	1070 bp	8, 18, 22, 35, 37, 38, 39, 44, 51, 5102, 5103, 53, 78	*07:65[w], 07:134[w], 08:32, 08:133, 08:180, 15:308, 18:01:01:01-18:03:01, 18:04:01-18:11, 18:13-18:15, 18:17N-18:36, 18:38-18:47, 18:49-18:65, 18:67-18:106, 18:108-18:124, 18:126-18:149, 35:01:01:01-35:08:04, 35:08:06-35:09:03, 35:11:01-35:12:04, 35:14:01-35:15:02, 35:17:01-35:18, 35:20:01-35:24:02, 35:27, 35:29:01-35:45, 35:48, 35:50-35:62, 35:64:01-35:68:02, 35:70-35:72, 35:74-35:75, 35:76[w], 35:77-35:79, 35:81-35:153, 35:155-35:185, 35:187-35:190, 35:192-35:197, 35:199-35:206, 35:208-35:209, 35:211-35:216N, 35:218-35:225, 35:227-35:253, 35:255-35:269, 35:272-35:273, 35:275-35:310, 35:312-35:316, 35:319-35:360, 35:362-35:372, 37:08, 37:67, 38:06-38:07, 39:19:01-39:19:02, 44:06, 45:22, 51:01:01:01-51:24:05, 51:26-51:46, 51:48-51:103, 51:105-51:111, 51:113-51:117, 51:119-51:146, 51:148-51:230, 51:232-51:236, 53:01:01-53:16, 53:18-53:27, 53:29, 53:31-53:37, 53:40-53:50, 56:06[w], 56:45[w], 78:01:01:01-78:04, 78:07-78:09
62[7,9]	150 bp	1070 bp	15, 18, 22, 27, 35, 39, 46, 55, 62, 72, 73, 75, 76	*07:100, 13:31, 13:41, 15:01:01:01-15:01:04, 15:01:06-15:01:16, 15:01:18-15:01:30, 15:01:32-15:01:43, 15:04:01:01-15:04:04, 15:07:01:01-15:08:02, 15:11:01-15:12:02, 15:14-15:15, 15:19, 15:24:01-15:24:02, 15:26N-15:28, 15:30:01:01-15:30:01:02, 15:32:01-15:32:02, 15:34-15:35, 15:38:01-15:38:02, 15:43, 15:45-15:46, 15:50, 15:53-15:54, 15:56-15:58, 15:60, 15:63, 15:66, 15:68, 15:70-15:71, 15:73, 15:75-15:77, 15:79N, 15:81-15:82, 15:85, 15:87, 15:92, 15:94N, 15:96-15:97, 15:101-15:102, 15:104-15:105, 15:109-15:111N, 15:113, 15:117-15:118, 15:120, 15:122, 15:125-15:126, 15:128-15:129, 15:135, 15:137, 15:140, 15:142-15:149N, 15:152, 15:154, 15:157, 15:159-15:160, 15:163-15:167, 15:169, 15:171-15:172, 15:174-15:175, 15:178, 15:180-15:184, 15:187, 15:189-15:193, 15:201-15:203, 15:205-15:207, 15:209N, 15:211-15:212, 15:215, 15:217, 15:225, 15:227-15:228, 15:231-15:234, 15:236, 15:239, 15:241, 15:244-15:247, 15:251:01-15:251:02, 15:256-15:262N, 15:264, 15:267, 15:269-15:270, 15:272N, 15:276-15:280, 15:284-15:286, 15:296, 15:298-15:299, 15:303-15:305, 15:309, 15:315-15:318, 15:320-15:321Q, 15:324, 15:326-15:327, 15:331, 15:333-15:334, 15:336, 15:340, 15:342-15:344, 15:346-15:347, 15:349:01-15:350, 15:353, 15:355, 15:359, 15:363:01-15:363:02, 15:365, 15:367-15:368, 15:370-15:373, 15:375N, 15:377Q, 15:381, 15:385-15:387, 15:390-15:392, 15:398, 15:400N-15:401, 15:405-15:406, 15:409-15:410, 15:412-15:413, 15:415-15:417, 15:419, 15:422, 15:428-15:432, 15:440-15:443, 15:450, 18:19, 27:25, 27:75, 27:115, 27:161, 35:14:01-35:14:03, 35:43-35:44, 35:62, 35:67, 35:79, 35:86, 35:102, 35:117, 35:135, 35:163, 35:185, 35:213, 35:265, 35:343,

Lot No.: 3H8 **Lot-specific information**

				37:60, 37:66, 39:18, 39:36, 44:146, 44:275, 46:01:01-46:02, 46:04-46:05, 46:07N, 46:09-46:10, 46:12, 46:14-46:17, 46:20, 46:22-46:24, 46:26-46:32, 46:34-46:42, 46:44, 46:46-46:53, 46:55N-46:57, 46:60-46:61, 46:63-46:74, 50:47, 51:61:01-51:61:02, 51:220, 52:21:01-52:21:02, 54:06, 54:33, 55:21, 56:03, 56:43, 58:78, 73:01-73:02, **A*26:68, A*26:100, A*68:56, C*02:56, C*06:20, C*12:50**
63[8,13]	360 bp	1070 bp	B^w4	*07:27, 07:36, 07:38, 07:81, 07:149, 07:180, 07:219, 07:236, 07:273, 08:02-08:03, 08:52, 08:78, 08:117, 08:126, 13:01:01:01-13:04, 13:06-13:08, 13:10-13:23, 13:25-13:38, 13:40-13:66, 13:68-13:111, 15:13:01-15:13:02, 15:16:01:01-15:17:07, 15:23-15:24:02, 15:36, 15:43, 15:67, 15:87, 15:89, 15:95, 15:115, 15:157, 15:162, 15:168, 15:177, 15:196, 15:208, 15:216, 15:222, 15:230, 15:254, 15:256, 15:268, 15:273, 15:339, 15:356, 15:361-15:362, 15:396, 15:403, 15:408, 15:411, 15:418, 15:423-15:424, 15:442, 15:446, 18:09, 18:54, 18:67, 18:136, 27:01-27:07:06, 27:09-27:11, 27:13-27:17, 27:19-27:21, 27:23-27:25, 27:27-27:32, 27:34-27:39, 27:41, 27:43, 27:45-27:88, 27:90:01-27:152, 27:154-27:168, 27:170-27:175, 35:36, 35:329, 37:01:01:01-37:04:02, 37:06:01-37:10, 37:12-37:36, 37:38-37:66, 37:68-37:71, 38:01:01:01-38:71, 40:13, 40:19, 40:47, 40:96, 40:109-40:110, 40:117, 40:157, 40:188, 40:201, 40:207, 40:246, 40:292, 40:340, 41:46, 44:02:01:01-44:08, 44:10-44:45, 44:47-44:74, 44:76-44:89, 44:91-44:128:02, 44:130, 44:132-44:245, 44:247-44:253, 44:255-44:276, 44:278-44:288, 47:01:01:02-47:01:03, 47:03-47:10, 48:18, 49:01:01:01-49:14, 49:16-49:20, 49:22-49:50, 51:01:01:01-51:24:05, 51:26-51:46, 51:48-51:236, 52:01:01:01-52:76, 53:01:01-53:50, 54:12, 56:07, 56:21, 56:46, 57:01:01:01-57:11, 57:13-57:100, 58:01:01:01-58:02:02, 58:04-58:29, 58:31N-58:63, 58:65-58:93N, 59:01:01:01-59:10N
64	350 bp	1070 bp	B^w6	*07:02:01:01-07:26, 07:28-07:35, 07:37:01-07:37:02, 07:39-07:80, 07:82-07:148, 07:150-07:179, 07:181N-07:191, 07:193-07:218, 07:220-07:235, 07:237-07:272N, 07:274-07:316N, 08:01:01:01-08:01:39, 08:04:01-08:05, 08:07-08:51, 08:53:01-08:77, 08:79-08:116, 08:118-08:125, 08:127-08:130, 08:132-08:135, 08:137-08:138, 08:140-08:152, 08:154-08:156, 08:158-08:196, 13:09, 13:39, 13:67, 14:01:01:01-14:61, 15:01:01:01-15:01:04, 15:01:06-15:12:02, 15:14-15:15, 15:18:01:01-15:21:01:02, 15:25:01-15:35, 15:37-15:40:02, 15:42, 15:44-15:58, 15:60-15:66, 15:68-15:86, 15:88, 15:90-15:94N, 15:96-15:99, 15:101-15:114, 15:116-15:129, 15:131-15:156, 15:158-15:161, 15:163-15:167, 15:169-15:176, 15:178-15:195, 15:197:01-15:207, 15:209N-15:215, 15:217-15:221, 15:223-15:229, 15:231-15:253, 15:255, 15:257-15:267, 15:269-15:272N, 15:274-15:276, 15:278-15:338, 15:340-15:355, 15:357-15:360, 15:363:01-15:376, 15:378-15:395, 15:397-15:402, 15:404-15:407, 15:409-15:410, 15:412-15:417, 15:419-15:422, 15:425-15:429, 15:431-15:441, 15:443-15:445, 15:447-15:450, 18:01:01:01-18:08, 18:10-18:15, 18:17N-18:53, 18:55-18:66, 18:68-18:135, 18:137-18:149, 27:08, 27:12:01:01-27:12:01:02, 27:18, 27:26, 27:33, 27:40, 27:42, 27:44, 27:89, 27:153, 27:165^w, 35:01:01:01-35:01:38, 35:01:40-35:02:08, 35:03:01:01-35:72, 35:74-35:221, 35:223-35:247, 35:249-35:292, 35:294-35:328, 35:330-35:372,

	37:05, 37:11, 37:14[w], 37:37, 37:67, 39:01:01:01-39:01:01:07, 39:01:03:01-39:01:14, 39:01:16-39:20, 39:22-39:103, 39:105-39:136, 40:01:01-40:01:50, 40:01:52-40:12, 40:14:01-40:16, 40:18, 40:20:01:01-40:40, 40:42-40:46, 40:48-40:75, 40:77-40:95, 40:97-40:108, 40:111-40:116, 40:118N-40:156, 40:158-40:187, 40:189-40:200, 40:202-40:291N, 40:293-40:339, 40:341-40:365, 40:367-40:371, 41:01:01:01-41:25, 41:27-41:45N, 41:47-41:55, 42:01:01-42:02:01:02, 42:04-42:21, 42:23-42:25, 44:09, 44:46, 44:75, 44:90, 44:129, 44:131, 44:254, 44:277, 45:01:01-45:15, 45:17-45:23, 46:01:01-46:74, 47:02, 47:03[w], 48:01:01:01-48:17, 48:19-48:46, 50:01:01:01-50:02, 50:04-50:20, 50:31-50:55, 54:01:01-54:11, 54:13-54:38, 55:01:01-55:05, 55:07-55:89N, 56:01:01:01-56:06, 56:08-56:20:02, 56:22-56:45, 56:47-56:54, 56:55:01:02-56:57, 57:12, 58:64, 67:01:01-67:07, 73:01-73:02, 78:01:01:01-78:09, 81:01:01-81:08, 82:01:01:01-82:03, 83:01

[1]Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of HLA-B low resolution SSP typings.
When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.
Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers.
PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.
PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.
Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherit feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

[2]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

[3]The serological reactivity of all HLA-B alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

[4]For several HLA Class I alleles 1st and/or 4th exon(s) and beyond, as well as intron nucleotide sequences, are not available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

[5]HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

[6]Primer mix 25 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes in B*40, B*41, B*45, B*49 and B*50 alleles.

[7]Primer mixes 25, 26, 30, 38, 48, 57 and 62 may give rise to a lower yield of HLA-specific PCR product than the other HLA-B low resolution primer mixes.

[8]Primer mixes 29, 30, 34, 38, 56 and 63 may have tendencies of unspecific amplifications, most pronounced in primer mix 30.

[9]Primer mixes 22, 39, 40 and 62 have a tendency giving rise to primer oligomer formation.

[10]The B*15, B*46, B*57, B*58 and C*03 alleles may be faintly amplified by primer mix 30.

[11]Primer mix 57 may give rise to a lower yield of B*54 alleles than the other B low primer mixes.

[12]The C*17 alleles might be faintly amplified by primer mix 45.

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[13]The Bw4-associated HLA-A specificities A23, A24, A2403, A25 and A32 are not amplified by the primer pair in primer mix 63.
'w', might be weakly amplified.
'?', nucleotide sequence information not available for the primer matching sequence.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8

Lot-specific information

SPECIFICITY TABLE

DR low resolution primer set

Specificities and sizes of the PCR products of the 23 primer mixes used for DR low resolution SSP typing

Primer Mix	Size of spec. PCR product[1]	Size of control band[2]	DR serology[3]	Amplified HLA-DRB alleles[4]
65[6]	210 bp, 235 bp, 260 bp	**515 bp**	1	*01:01:01-01:02:13, 01:04-01:38, 01:40N-01:89
66	200 bp	430 bp	1, 103	*01:03:01-01:03:02, 01:39N, 01:42, 01:61, 01:89
67[7]	200 bp, 230 bp	430 bp	2, 15	*15:01:01:01-15:158
68[7]	210 bp	430 bp	11, 16	*11:30, 12:57, 16:01:01-16:05:02, 16:07-16:48
69[5,9]	125 bp, 230 bp	**515 bp**	3, 11, 13, 17, 18	*03:01:01:01-03:125, 03:127-03:146, 11:07:01-11:07:02, 11:27:02-11:27:03, 11:84:02-11:84:03, 11:103:01-11:103:02, 11:105, 11:107, 11:125, 11:136, 11:173, 13:33:01, 13:61:02, 13:94:01, 13:96:01, 14:38:02, 14:104, 14:111, 14:171, 15:25, 15:37:01, 15:100, 15:104:01
70[5,9]	75 bp, 210 bp	430 bp	3, 6, 11, 13, 14, 17	*03:01:01:01-03:01:23, 03:01:25-03:01:28, 03:04:01-03:06, 03:08-03:16, 03:18-03:20, 03:22-03:23, 03:25:01-03:26, 03:28, 03:30-03:31, 03:33-03:34, 03:36-03:37, 03:43-03:48, 03:50-03:52, 03:54-03:68N, 03:70-03:73, 03:75-03:86, 03:89, 03:91-03:93, 03:95-03:96, 03:98-03:100:02, 03:104, 03:106-03:110, 03:112-03:114, 03:116-03:118, 03:121-03:130, 03:132-03:146, 08:40, 11:02:01-11:03:04, 11:11:01, 11:11:03, 11:14:01-11:14:02, 11:16, 11:20-11:21, 11:36, 11:40-11:41, 11:48, 11:59, 11:63:01-11:63:02, 11:65:01-11:65:02, 11:68, 11:70, 11:73, 11:76, 11:79-11:80, 11:83, 11:85-11:87, 11:93, 11:118, 11:122, 11:124, 11:127, 11:131-11:132, 11:135, 11:138-11:139, 11:142, 11:151, 11:153, 11:161, 11:168, 11:171, 11:176, 11:182, 11:184, 11:213, 13:01:01:01-13:04, 13:08, 13:10, 13:15-13:17, 13:19-13:20, 13:22-13:24, 13:27-13:29, 13:31-13:41, 13:43, 13:45, 13:48, 13:51-13:54, 13:57, 13:59, 13:61:01-13:61:02, 13:63-13:66:02, 13:68-13:76, 13:78-13:81, 13:83-13:85, 13:87-13:99, 13:101-13:102, 13:104-13:107, 13:109, 13:111-13:117, 13:120-13:131, 13:133, 13:135, 13:137N-13:145, 13:147-13:149, 13:151-13:153, 13:155, 13:159, 13:162, 13:165-13:168, 13:170-13:180, 13:182, 13:184-13:188, 13:190-13:191, 13:193-13:194, 13:196, 13:198, 13:200N-13:202, 13:204-13:205, 13:207-13:209, 13:212-13:219, 13:221, 13:223, 13:225-13:227, 13:230, 13:233-13:234, 13:236-13:245, 13:247, 13:249N-13:261, 14:16, 14:19, 14:21, 14:45, 14:82, 14:95, 14:109, 14:120, 14:122, 14:132, 14:178-14:179

Lot No.: 3H8 **Lot-specific information**

71[5]	85 bp, 210 bp	430 bp	3, 6, 11, 13, 14, 1403, 18	*03:02:01-03:03, 03:27, 03:29, 03:38, 03:53, 03:74, 03:88, 03:90, 03:102-03:103, 03:115, 03:119, 03:126, 03:131, 11:13:01[w]-11:13:02[w], 11:26, 11:34, 13:15, 13:19, 13:26:01-13:26:02, 13:44, 13:53, 13:57, 13:85-13:86, 13:104, 13:193, 13:198, 13:206, 13:235, 14:02:01:01-14:03:02, 14:06:01-14:06:04, 14:09, 14:12:01-14:13, 14:17-14:21, 14:24, 14:27:01-14:27:02, 14:29-14:30, 14:32:01[w]-14:32:02[w], 14:33, 14:40-14:41, 14:47-14:49, 14:51, 14:63, 14:65[w], 14:67, 14:77-14:78, 14:80-14:81, 14:83, 14:85, 14:89, 14:94, 14:98, 14:102, 14:106, 14:108-14:109, 14:115, 14:119, 14:121, 14:135, 14:146, 14:154, 14:156, 14:159-14:160, 14:165, 14:170, 14:174, 14:176-14:177, 14:179, 14:181, 14:183, 14:194-14:195N, 14:198
72[5,6,7]	100 bp, 175 bp	430 bp	3, 4	*04:01:01:01-04:05:11, 04:05:13-04:252
73[7]	180 bp, 205 bp, 230 bp	430 bp	7, 13, 14	*07:01:01:01-07:01:22, 07:03-07:90, 08:67, 10:11, 12:22, 13:17, 13:116, 13:175, 13:214, 14:50
74[5]	120 bp, 215 bp, 250 bp	**515 bp**	7, 8, 14	*07:06, 08:01:01-08:01:02, 08:01:04-08:19, 08:21-08:30:03, 08:32-08:56, 08:58-08:66, 08:68:01-08:79, 08:81-08:86, 11:67, 11:193:01-11:193:02, 12:16:01-12:16:03, 12:22, 12:39, 13:171:01, 13:197, 14:15, 14:68:01-14:68:02, 14:93
75[5]	85 bp, 100 bp, 135 bp, 165 bp, 195 bp	430 bp	3, 9, 11	*03:08, 03:65, 03:140, 09:01:02:01-09:34, 11:07:01-11:07:02, 11:103:01-11:103:02, 11:105, 11:107, 11:125, 11:173, **DRB3*01:42**
76[6]	175 bp	430 bp	9, 10, 11, 13	*03:76, 03:125-03:126, 09:05, 10:01:01:01-10:27, 11:59, 11:80, 11:83, 11:87, 11:135, 11:142, 11:182, 13:27, 13:41, 13:71, 13:129, 13:176, 14:82, 14:95, 14:132, 14:179
77[5]	100 bp, 170 bp	430 bp	3, 8, 11, 13, 14	*03:08, 03:65, 03:140, 08:31, 08:41, 08:63, 08:75, 11:01:01:01-11:11:01, 11:11:03-11:70, 11:72-11:228
78[5]	90 bp, 110 bp	430 bp	12, 14	*08:32, 08:53, 12:01:01:01-12:56, 12:58-12:69, 14:52
79[6]	210 bp, 235 bp	430 bp	6, 8, 11, 13, 14, 1403	*03:76, 03:125, 08:20-08:21, 11:01:01:01-11:01:27, 11:01:28[?], 11:01:29-11:04:15, 11:06:01-11:06:03, 11:08:01-11:11:01, 11:11:03-11:12:03, 11:14:01-11:16, 11:18-11:21, 11:23:01-11:25, 11:27:01-11:33, 11:35-11:51, 11:54:01-11:54:02, 11:56-11:66, 11:68, 11:70, 11:72-11:81, 11:83-11:88, 11:90-11:97, 11:99-11:102:02, 11:106, 11:108-11:124, 11:126-11:135, 11:137-11:142, 11:144-11:158, 11:160-11:172, 11:174-11:192, 11:194-11:201, 11:203-11:208, 11:210-11:228, 12:57, 13:01:01:01-13:02:01:03, 13:02:03-13:08, 13:10-13:16, 13:18-13:43, 13:45-13:85, 13:87-13:115, 13:117-13:128, 13:130-13:145, 13:147-13:174, 13:176-13:182, 13:184-13:191, 13:194-13:205, 13:207-13:209, 13:212-13:213, 13:215-13:221, 13:223-13:247, 13:249N-13:261, 14:03:01-14:03:02, 14:12:01-14:12:02, 14:16, 14:19, 14:21-14:22, 14:25, 14:27:01-14:27:02, 14:40, 14:53, 14:63, 14:67, 14:69, 14:74, 14:77-14:78,

				14:84-14:85, 14:98, 14:102, 14:105, 14:109, 14:115-14:116, 14:128, 14:135, 14:144, 14:156, 14:173-14:174, 14:181, **DRB3*02:27**
80[6]	195 bp, 225 bp	430 bp	6, 8, 11, 12, 13, 14	*03:125, 08:01:01-08:01:02, 08:01:04-08:01:05, 08:01:07-08:02:04, 08:04:01-08:09, 08:11, 08:16-08:17, 08:20-08:22, 08:24:01-08:24:02, 08:26, 08:28, 08:31, 08:39, 08:41-08:44, 08:50, 08:52, 08:54-08:55, 08:57, 08:59, 08:64, 08:67, 08:70, 08:72-08:73, 08:75, 08:77-08:80, 08:82-08:86, 11:01:01:01-11:01:17, 11:01:20-11:06:03, 11:09-11:11:01, 11:11:03-11:12:03, 11:14:01-11:16, 11:20-11:21, 11:23:01-11:25, 11:27:01-11:30, 11:32-11:33, 11:35-11:41, 11:43-11:44, 11:46:01-11:51, 11:54:01-11:56, 11:58:01-11:63:02, 11:65:01-11:70, 11:72, 11:74:01-11:78, 11:80-11:88, 11:90-11:97, 11:99-11:102:02, 11:106, 11:108-11:118, 11:120-11:124, 11:126-11:129, 11:133-11:135, 11:137-11:142, 11:144-11:152, 11:154-11:158, 11:160-11:172, 11:174-11:183, 11:185-11:190, 11:192-11:201, 11:203-11:228, 12:02:01:01-12:02:08, 12:13, 12:15-12:16:03, 12:18-12:21, 12:23, 12:26-12:27, 12:31N-12:33, 12:37, 12:42-12:45, 12:49-12:52, 12:55-12:57, 12:60N-12:61, 12:64-12:65, 12:67, 12:69, 13:01:01:01-13:02:01:03, 13:02:03-13:02:15, 13:04-13:05:03, 13:07:01-13:09, 13:11:01-13:11:02, 13:14:01-13:24, 13:26:01-13:29, 13:31-13:32, 13:34-13:36, 13:38-13:43, 13:45-13:55, 13:57, 13:59, 13:61:01-13:65, 13:67-13:76, 13:78-13:80, 13:83-13:84, 13:87, 13:91-13:93, 13:96:01-13:100, 13:102-13:109, 13:111-13:114, 13:116-13:117, 13:121, 13:123-13:132, 13:135-13:136, 13:138-13:150, 13:153, 13:155, 13:158-13:160, 13:162, 13:164-13:166, 13:168-13:169, 13:171:01-13:171:02, 13:173, 13:175, 13:177, 13:179, 13:182-13:187, 13:189-13:192, 13:195, 13:197-13:205, 13:207-13:215, 13:217-13:218, 13:221-13:223, 13:225-13:226, 13:229-13:230, 13:232-13:234, 13:236-13:252N, 13:254-13:261, 14:15-14:16, 14:22, 14:24-14:25, 14:27:01-14:27:02, 14:37, 14:53, 14:73, 14:105, 14:128
81[9]	175 bp, 240 bp	430 bp	3, 4, 6, 8, 11, 13, 14, 1403, 1404, 17, 18	*03:01:01:01-03:01:05, 03:01:07-03:01:08, 03:01:10-03:07:02, 03:09, 03:11:01-03:41:02, 03:43-03:45, 03:47-03:63, 03:66-03:68N, 03:70-03:86, 03:88-03:91, 03:93-03:110, 03:112-03:129, 03:131-03:139, 03:141-03:146, 08:20, 11:03:04, 11:13:01-11:13:02, 11:149, 11:202, 12:20, 13:01:01:01-13:16, 13:18-13:42, 13:44, 13:46-13:66:02, 13:68-13:102, 13:104-13:115, 13:117-13:121, 13:123-13:158, 13:161-13:164, 13:166-13:170, 13:171:02-13:174, 13:176-13:178, 13:180-13:190, 13:192-13:194, 13:196, 13:198-13:213, 13:215-13:216, 13:218-13:227, 13:229-13:247, 13:249N-13:261, 14:01:01, 14:01:02?-14:01:04?, 14:02:01:01-14:04:01, 14:04:02?-14:04:03?, 14:04:04-14:07:01, 14:07:02?, 14:08-14:14, 14:15?-14:16?, 14:17-14:21, 14:22?, 14:23:01, 14:23:02?, 14:23:03-14:24, 14:25?-14:26?,

				14:27:01-14:27:02, 14:28[?], 14:29-14:30, 14:31[?]-14:32:03[?], 14:33, 14:34[?]-14:35[?], 14:36-14:37, 14:38:01[?]-14:39[?], 14:40-14:45, 14:47-14:48, 14:49[?]-14:50[?], 14:51, 14:52[?], 14:54:01:01-14:54:06, 14:55[?], 14:56-14:57, 14:58[?], 14:59, 14:60[?]-14:62[?], 14:63-14:65, 14:67, 14:68:01[?]-14:76[?], 14:77-14:78, 14:79[?], 14:80-14:85, 14:86[?]-14:88[?], 14:89, 14:90[?], 14:91, 14:92N[?]-14:93[?], 14:94-14:96, 14:97[?], 14:98, 14:99[?], 14:100, 14:101[?], 14:102-14:103, 14:104[?]-14:105[?], 14:106, 14:107[?], 14:108-14:109, 14:110[?]-14:114[?], 14:115-14:116, 14:117[?]-14:120[?], 14:121, 14:122[?], 14:123, 14:124[?]-14:126:02[?], 14:127:01-14:127:02, 14:128[?]-14:133[?], 14:134-14:137N, 14:138[?]-14:140[?], 14:141, 14:142[?]-14:143[?], 14:144, 14:145[?]-14:151[?], 14:152N, 14:153[?], 14:154-14:156, 14:157[?]-14:158[?], 14:159-14:161, 14:162[?]-14:164[?], 14:165, 14:166N[?], 14:167, 14:168[?], 14:169-14:171, 14:172[?]-14:173[?], 14:174, 14:175[?], 14:176-14:177, 14:178[?], 14:179, 14:180[?], 14:181, 14:182[?], 14:183, 14:184[?]-14:186[?], 14:187-14:188N, 14:189[?]-14:190[?], 14:191-14:199
82[5,6]	100 bp, 150 bp, 195 bp, 240 bp	430 bp	4, 6, 8, 13, 14, 1404	*04:62, 04:69, 04:73:01-04:73:02, 04:105:01-04:105:02, 04:122, 04:146, 04:251, 08:08, 11:69, 11:82, 13:45, 13:197, 14:01:01-14:01:02, 14:01:04, 14:04:01-14:04:06, 14:07:01-14:07:02, 14:10, 14:16, 14:22, 14:25-14:26, 14:28, 14:31-14:32:03, 14:35, 14:37-14:39, 14:49-14:50, 14:53-14:54:01:03, 14:54:03-14:55, 14:57-14:58, 14:60-14:62, 14:68:01-14:71, 14:73-14:76, 14:79, 14:82, 14:86-14:88, 14:90, 14:93, 14:99, 14:101, 14:104-14:105, 14:107, 14:110-14:114, 14:117-14:120, 14:122, 14:124-14:125, 14:128-14:129, 14:131, 14:137N-14:140, 14:142-14:143, 14:145-14:147, 14:149-14:153, 14:157-14:158, 14:163-14:164, 14:166N, 14:168[w], 14:171-14:173, 14:178, 14:180, 14:182, 14:184, 14:186, 14:189-14:192, 14:196-14:197N, 14:199, **DRB4*01:03:01:02N**
83[5,6,8]	110 bp, 140 bp, 150 bp, 175 bp	430 bp	3, 4, 6, 9, 11, 13, 14, 1404	*03:10, 03:126, 04:211, 09:01:02:01-09:01:05, 09:01:07-09:02:02, 09:04-09:22, 09:24-09:28, 09:30-09:34, 11:13:01-11:13:02, 11:17, 11:52, 11:202, 12:66, 13:43, 13:159, 13:171:01, 13:179, 13:191, 13:193, 13:217, 14:01:01-14:02:06, 14:04:01-14:11, 14:13-14:14, 14:16-14:18, 14:19[w], 14:20, 14:21[w], 14:22-14:23:04, 14:26, 14:28-14:36, 14:38:01-14:39, 14:41, 14:43-14:52, 14:54:01:01-14:54:03, 14:54:04[w], 14:54:05-14:57, 14:59-14:62, 14:64-14:65, 14:68:01-14:68:02, 14:70-14:76, 14:79-14:83, 14:86-14:88, 14:90-14:97, 14:99-14:101, 14:103-14:108, 14:109[w], 14:110-14:114, 14:117-14:127:02, 14:129-14:134, 14:137N-14:140, 14:142-14:143, 14:145-14:155, 14:157-14:160, 14:162-14:173, 14:175-14:180, 14:182, 14:184-14:185, 14:187-14:199, 15:27, 15:34, 15:54, 15:66:01-15:66:02, 15:122, 15:158
84[5,6,7]	110 bp, 150 bp, 180 bp, 220 bp	430 bp	2, 3, 4, 6, 8, 11, 13, 14, 1403, 1404, 16	*03:10, 08:09, 08:20-08:21, 08:32, 08:35, 08:36:02, 08:53, 08:68:01[w], 08:70[w], 11:13:01-11:13:02, 11:17, 11:23:01-11:23:02, 11:25, 11:31, 11:45, 11:52, 11:55, 11:64, 11:89, 11:96, 11:119, 11:148, 11:159, 11:202, 13:13, 13:18, 13:43, 13:45, 13:47, 13:55, 13:119,

				13:144, 13:146, 13:154, 13:156, 13:158-13:159, 13:164, 13:171:01, 13:179, 13:191, 13:197, 13:217, 13:232, 14:01:01-14:01:04, 14:03:01-14:05:04, 14:07:01-14:08, 14:10-14:12:02, 14:14-14:16, 14:18, 14:22-14:23:04, 14:25-14:28, 14:31-14:32:03, 14:34-14:36, 14:38:01-14:40, 14:42-14:45, 14:49-14:50, 14:53-14:65, 14:67-14:79, 14:81-14:82, 14:84-14:93, 14:95-14:97, 14:99-14:105, 14:107, 14:110-14:120, 14:122-14:140, 14:142-14:158, 14:160-14:164, 14:166N-14:169, 14:171-14:175, 14:178, 14:180-14:182, 14:184-14:193, 14:196-14:197N, 14:199, 15:21[w], 15:158[w], 16:04:01[w]-16:04:02[w], 16:18[w], **DRB4*01:31**
85[5,6,9]	80 bp, 160 bp, 240 bp	430 bp	52	*14:141, **DRB3*01:01:02:01-01:48, DRB3*02:01-02:79, DRB3*03:01:01-03:18**
86[6]	130 bp, 215 bp	430 bp	53	**DRB4*01:01:01:01-01:69, DRB4*02:01N, DRB4*03:01N**
87	175 bp	430 bp	51	**DRB5*01:01:01-01:39, DRB5*02:02:01-02:20**

[1]Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DR low resolution SSP typings.
When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.
Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers.
PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.
PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.
Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherit feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

[2]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases. In the presence of a specific amplification the intensity of the control band often decreases.

[3]The serological reactivity of all DRB alleles is not known. The grouping of not serologically defined alleles is taken from Tissue Antigens 73, 95-170, 2009.

[4]For several DRB1 alleles 1st and/or 3rd exon(s) and beyond, as well as intron nucleotide sequences, are not available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

[5]HLA-specific PCR fragments shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR bands.

[6]Primer mixes 65, 72, 76, 79, 80 and 82 to 86 have a tendency giving rise to primer oligomer formation.

[7]Primer mix 67, 68, 72, 73 and 84 may have tendency of unspecific amplification.

[8]Primer mix 83 has a tendency of primer oligomer formation and also has an intense primer cloud due to the high number of primers present in the primer mix.

[9]Due to sharing of sequence motifs in codon 38 and 47, DRB3*01:14 will also be amplified in primer mixes 69, 70 and 81, and DRB3*01:23 and 02:32 in primer mix 69, in addition to primer mix 85.

'w', might be weakly amplified.
'?', nucleotide sequence information not available for the primer matching sequence.

Lot No.: 3H8 **Lot-specific information**

SPECIFICITY TABLE

DQ low resolution primer set

Specificities and sizes of the PCR products of the 8+1 primer mixes used for DQ low resolution SSP typing

Primer Mix	Size of spec. PCR product[1]	Size of control band[2]	DQ serology[3]	Amplified DQB1 alleles[4]
88	135 bp, 230 bp	**515 bp**	5, 6	*05:01:01:01-05:161, 06:23, 06:156, 06:162, 06:169
89[5,6]	65 bp, 110 bp, 135 bp, 160 bp, 185 bp, 220 bp, 270 bp	**515 bp**	1, 5, 6	*03:23:01, 03:259, 05:43:02[w], 05:62, 06:01:01:01-06:02:28, 06:02:30-06:05:01, 06:05:02[?], 06:06-06:219, 06:221-06:275
90	210 bp	430 bp	2	*02:01:01-02:106
91[7]	220 bp	**515 bp**	3, 7	*03:01:01:01-03:01:01:12, 03:01:01:14-03:01:41, 03:04:01-03:04:03, 03:09-03:10:02:02, 03:13-03:14:02, 03:16, 03:19:01-03:19:02, 03:21-03:22, 03:24, 03:27-03:29, 03:35-03:36, 03:42, 03:44, 03:46-03:60, 03:69, 03:71, 03:73, 03:75-03:77, 03:80, 03:82-03:84N, 03:92-03:94, 03:101-03:103, 03:108-03:109, 03:114-03:116, 03:118N-03:122, 03:127-03:131, 03:133-03:135, 03:138-03:140, 03:142-03:144, 03:147-03:148, 03:150, 03:152, 03:154, 03:157-03:160, 03:162-03:167, 03:169-03:173, 03:180, 03:182-03:183, 03:186-03:188, 03:191-03:198, 03:201-03:202, 03:206-03:208, 03:216, 03:218-03:219, 03:231-03:232, 03:235-03:236, 03:241-03:243, 03:246, 03:252-03:257, 03:260, 03:264, 03:266-03:268, 03:271, 03:275-03:276N, 03:281, 06:209
92[7]	130 bp, 220 bp	**515 bp**	6, 8	*03:02:01:01-03:02:30, 03:05:01-03:05:04, 03:07-03:08, 03:11, 03:18, 03:32, 03:37, 03:45, 03:61, 03:63-03:64, 03:66N-03:68, 03:70, 03:85, 03:104, 03:106-03:107, 03:125, 03:132, 03:146, 03:153, 03:161, 03:174-03:175, 03:178-03:179, 03:181, 03:184-03:185, 03:189-03:190, 03:199, 03:203-03:205, 03:210-03:211, 03:213N-03:215, 03:220-03:221, 03:223-03:224, 03:226, 03:228-03:229, 03:233, 03:237N, 03:240, 03:245, 03:247, 03:250-03:251, 03:261-03:263, 03:265, 03:269N, 03:273-03:274, 03:277-03:278, 06:29, 06:123, 06:139
93[7,8]	135 bp	**515 bp**	2, 3, 9	*02:03, 02:77, 03:03:02:01-03:03:05, 03:03:07-03:03:16, 03:12, 03:15, 03:20, 03:23:03, 03:26, 03:30-03:31, 03:33-03:34, 03:38-03:41, 03:43, 03:65, 03:74, 03:79, 03:86-03:91Q, 03:95N-03:99Q, 03:104-03:105, 03:111-03:113, 03:117, 03:123-03:124, 03:126, 03:136-03:137, 03:141, 03:145, 03:149, 03:155-03:156, 03:168, 03:176-03:177, 03:200, 03:209, 03:212, 03:222, 03:227,

				03:230, 03:234, 03:238-03:239, 03:248-03:249, 03:258, 03:270, 03:280, 03:282N, 06:03:10, 06:51:01, 06:66, 06:96:01, 06:168, 06:172
94[5,7,8]	85 bp, 185 bp	**515 bp**	3, 7, 8, 9	*03:01:01:01-03:01:01:12, 03:01:01:14-03:01:33, 03:01:35-03:03:15, 03:04:01-03:103, 03:105-03:153, 03:155-03:278, 03:280-03:282N, 04:01:03, 04:02:16, 04:03:03, 04:09
95[7]	135 bp, 170 bp, 205 bp	430 bp	4	*03:132, 04:01:01:01-04:02:01:01, 04:02:01:04-04:03:02, 04:04-04:50
96[9]				**Negative control**

[1]Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DQ low resolution SSP typings.
When the primers in a primer mix can give rise to HLA-specific PCR products of more than one length this is indicated if the size difference is more than 20 base pairs. Size differences of 20 base pairs or less are not given. For high resolution SSP kits, the alleles listed are specified according to amplicon length.
Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers.
PCR fragments longer than the control bands may sometimes be observed. Such bands should be disregarded and do not influence the interpretation of the SSP typings.
PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.
Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherit feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

[2]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases. In the presence of a specific amplification the intensity of the control band often decreases.

[3]The serological split of the DQB1*05:05-05:161, DQB1*06:06 to 06:07 alleles, the DQB1*06:10, 06:13, 06:15-06:24 and 06:27 to 06:275, the DQB1*02:04-02:106, the DQB1*03:07-03:09 and 03:11-03:282N alleles and the DQB1*04:03:01-04:50 alleles is not known. In this table we have used the expert-assigned serological grouping in Tissue Antigens (2009) 73:95-170, and also inferred the serological grouping from the naming of the sequence-defined allele.

[4]For several DQB1 alleles 1st and/or 3rd exon(s) and beyond, as well as intron nucleotide sequences, are not available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. Assumption is made that unknown sequences in these regions are conserved within allelic groups.

[5]HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

[6]Primer mix 89 has a tendency giving rise to primer oligomer formation.

[7]Primer mixes 91 to 95 may give rise to a lower yield of HLA-specific PCR product than the other DQ low resolution primer mixes.

[8]Primer mixes 93 and 94 may have tendencies of unspecific amplifications.

[9]Primer mix 96 contains a negative control, which will amplify more than 95% of HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 430 base pairs.
'w', might be weakly amplified.
'?', nucleotide sequence information not available for the primer matching sequence.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

HLA-A LOW PRIMER SPECIFICATION

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec.	120	175	205	190	135	175	165	80	80	80	125	175
PCR product	145	215	235		200	205	200		240	175	165	225
	225	255									190	
		365										
		415										
Length of int.	800	800	1070	800	800	1070	800	800	800	1070	800	1070
pos. control[1]												
5'-primer(s)[2]	98	48	359	98	176	98	98	257	98	301	103	98
	5'-CTT 3'	5'-gCT 3'	5'-gCA 3'	5'-CTA 3'	5'-gCA 3'	5'-CTC 3'	5'-CTA 3'	5'-Cgg 3'	5'-CTA 3'	5'-Cgg 3'	5'-CCT 3'	5'-CTT 3'
	103	78	363	413	368	368	102	259	261	302	415	414
	5'-CCT 3'	5'-TCT 3'	5'-ATA 3'	5'-CCg 3'	5'-gTT 3'	5'-gTT 3'	5'-ACA 3'	5'-AgA 3'	5'-AAC 3'	5'-ggA 3'	5'-ggT 3'	5'-CAg 3'
	123	106	363				413	261		385	423	423
	5'-AgT 3'	5'-CCA 3'	5'-ATA 3'				5'-CCg 3'	5'-AAC 3'		5'-ggC 3'	5'-gCT 3'	5'-gCT 3'
	363							266				
	5'-ATA 3'							5'-ACg 3'				
3'-primer(s)[3]	203	240	527	256	270	259	259	302	299	341	257	282
	5'-TCT 3'	5'-ggA 3'	5'-CCA 3'	5'-CTg 3'	5'-ACA 3'	5'-gTT 3'	5'-gTT 3'	5'-ggC 3'	5'-TCg 3'	5'-CgT 3'	5'-gCA 3'	5'-gAC 3'
	545	292	527	559	521	502	259	303	308	521	506	282
	5'-AgA 3'	5'-gTg 3'	5'-CCT 3'	5'-CCg 3'	5'-ggg 3'	5'-CTT 3'	5'-gTT 3'	5'-AgA 3'	5'-TCT 3'	5'-ggg 3'	5'-TgT 3'	5'-gAC 3'
			527		534	539	538				538	559
			5'-CCT 3'		5'-CgT 3'	5'-TCT 3'	5'-CCA 3'				5'-CCg 3'	5'-CCC 3'
			555								559	560
			5'-CCA 3'								5'-CTC 3'	5'-ACC 3'
			555								559	
			5'-gCA 3'								5'-CgT 3'	
											559	
											5'-CgC 3'	
											563	
											5'-CgA 3'	
Well No.	1	2	3	4	5	6	7	8	9	10	11	12

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

Well No.	13	14	15	16	17	18	19	20	21
Length of spec.	80	90	240	140	205	340	210	65	75
PCR product	115	135	380	180	390	375	240	240	155
	200	205	410	235				375	240
	240			260				545	495
	460								
Length of int.	1070	1070	1070	1070	1070	800	800	800	800
pos. control[1]									
5'-primer(s)[2]	98	203	41	98	41	302	78	28	176
	5' -CAC 3'	5' -gAA 3'	5' -CTT 3'	5' -CTT 3'	5' -CTT 3'	5' -ggA 3'	5' -TCT 3'	5' -TCg 3'	5' -gCA 3'
	219	362	355	180	98	302	106	261	261
	5' -gCA 3'	5' -ggT 3'	5' -CCg 3'	5' -TTT 3'	5' -CAC 3'	5' -ggA 3'	5' -CCA 3'	5' -AAC 3'	5' -AAC 3'
	238	363		203		341	2nd I	502	341
	5' -AgA 3'	5' -ATA 3'		5' -gAA 3'		5' -ggA 3'	5' -CCT 3'	5' -CCC 3'	5' -ggA 3'
	355	363		418					355
	5' -CCg 3'	5' -ATA 3'		5' -AgC 3'					5' -CCC 3'
	489	363							362
	5' -gCA 3'	5' -ATA 3'							5' -gAg 3'
		369							362
		5' -TAC 3'							5' -gAg 3'
3'-primer(s)[3]	180	299	238	290	256	397	265	97	292
	5' -TCA 3'	5' -CCA 3'	5' -CCT 3'	5' -CAA 3'	5' -CCC 3'	5' -gAg 3'	5' -CCC 3'	5' -ggT 3'	5' -gTg 3'
	257	411	238	299	259		282	355	292
	5' -gCA 3'	5' -TCA 3'	5' -CCT 3'	5' -TCT 3'	5' -gTT 3'		5' -gAC 3'	5' -gAC 3'	5' -gTT 3'
	418	526	243	317	261		282	524	299
	5' -gTC 3'	5' -CCA 3'	5' -TCA 3'	5' -ggA 3'	5' -gTg 3'		5' -gAC 3'	5' -CAT 3'	5' -TCT 3'
	555		265	555	265		502		555
	5' -CCA 3'		5' -CCC 3'	5' -CCA 3'	5' -CCC 3'		5' -CTT 3'		5' -CCA 3'
			282		265		506		
			5' -gAC 3'		5' -CCC 3'		5' -TgT 3'		
			555		265				
			5' -CCA 3'		5' -CCA 3'				
Well No.	13	14	15	16	17	18	19	20	21

[1]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 1 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

[2]The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

[3]The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

HLA-B LOW PRIMER SPECIFICATION

Well No.	22	23	24	25	26	27	28	29	30	31	32	33
Length of spec.	285	215	140	140	185	190	290	165	165	180	90	195
PCR product			235	260	235			225	190		105	
								285	390		195	
								330				
Length of int.	800	1070	1070	800	800	800	1070	1070	1070	800	1070	1070
pos. control[1]												
5'-primer(s)[2]	355	97	209	103	103	103	45	45	45	420	206	142
	5'-TCA 3'	5'-TCg 3'	5'-ggC 3'	5'-CCg 3'	5'-CCT 3'	5'-CCg 3'	5'-ggA 3'	5'-ggA 3'	5'-ggA 3'	5'-TTA 3'	5'-AgA 3'	5'-TCT 3'
	363		363	103	103	418		357	435		416	419
	5'-AgC 3'		5'-AgC 3'	5'-CCg 3'	5'-CCT 3'	5'-Agg 3'		5'-Tgg 3'	5'-AAA 3'		5'-CCg 3'	5'-gTC 3'
			363	361	363			412			420	
			5'-AgC 3'	5'-AgT 3'	5'-AAT 3'			5'-ATA 3'			5'-TTA 3'	
				363							420	
				5'-AgC 3'							5'-TTC 3'	
3'-primer(s)[3]	603	272	309	193	246	246	165	206	266	559	256	301
	5'-gTg 3'	5'-Tgg 3'	5'-gTg 3'	5'-CgT 3'	5'-TAT 3'	5'-TAT 3'	5'-Tgg 3'	5'-CCT 3'	5'-TCC 3'	5'-CTC 3'	5'-CCC 3'	5'-gTC 3'
	605	272	312	193	246	572		538	559		272	301
	5'-gCT 3'	5'-TgA 3'	5'-gCC 3'	5'-CgT 3'	5'-TAT 3'	5'-gCC 3'		5'-gTC 3'	5'-CAg 3'		5'-Tgg 3'	5'-gTC 3'
			559	463	559			603	583		572	570
			5'-CAg 3'	5'-gCT 3'	5'-CTC 3'			5'-gTg 3'	5'-gTg 3'		5'-gCg 3'	5'-CCg 3'
				583								572
				5'-gTg 3'								5'-gCg 3'
Well No.	22	23	24	25	26	27	28	29	30	31	32	33

Well No.	34	35	36	37	38	39	40	41	42	43	44	45
Length of spec.	105	115	80	105	140	55	210	170	110	395	160	180
PCR product	395	150		150		245					425	
	435					390						
						415						
Length of int.	1070	1070	1070	800	1070	1070	800	800	1070	1070	1070	1070
pos. control[1]												
5'-primer(s)[2]	45	161	167	349	206	45	142	409	246	44	44	355
	5'-ggA 3'	5'-Cgg 3'	5'-gCT 3'	5'-CTT 3'	5'-gAC 3'	5'-ggA 3'	5'-TCT 3'	5'-ggC 3'	5'-gAA 3'	5'-ggC 3'	5'-ggC 3'	5'-TCA 3'
	540			355		368	368	420			357	363
	5'-gAC 3'			5'-TCA 3'		5'-gTT 3'	5'-gTC 3'	5'-TTA 3'			5'-Tgg 3'	5'-Agg 3'
						557						
						5'-ggA 3'						
3'-primer(s)[3]	272	234	204	412	301	259	311	544	317	272	302	499
	5'-TgC 3'	5'-TCT 3'	5'-TCT 3'	5'-gTT 3'	5'-gCT 3'	5'-gTT 3'	5'-ggg 3'	5'-ggT 3'	5'-ggA 3'	5'-TgC 3'	5'-ggC 3'	5'-ggA 3'
	272	272		463	302	259	311		320		302	
	5'-TgT 3'	5'-TgA 3'		5'-gCT 3'	5'-ggC 3'	5'-gTT 3'	5'-ggg 3'		5'-AgT 3'		5'-ggT 3'	
	309	272			311	266	538				477	
	5'-ATC 3'	5'-Tgg 3'			5'-ggT 3'	5'-TCC 3'	5'-gTC 3'				5'-gCg 3'	
	605				312	272						
	5'-gCT 3'				5'-AgT 3'	5'-Tgg 3'						
						292						
						5'-gTA 3'						
						572						
						5'-gCg 3'						
Well No.	34	35	36	37	38	39	40	41	42	43	44	45

CE 0197

For *In Vitro* Diagnostic Use.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

Well No.	46	47	48	49	50	51	52	53	54	55	56	57
Length of spec.	105	325	80	130	90	90	105	120	430	145	300	160
PCR product			115	280	410	175	145	210				370
			160				395					
			195				430					
			225									
			260									
Length of int.	1070	800	1070	800	1070	1070	1070	800	1070	1070	1070	1070
pos. control[1]												
5'-primer(s)[2]	540	1st I	355	209	41	209	48	357	49	206	1st I	15
	5' -gAC 3'	5' -CAg 3'	5' -TCA 3'	5' -ggC 3'	5' -CTg 3'	5' -ggC 3'	5' -gCC 3'	5' -Tgg 3'	5' -CAg 3'	5' -gAA 3'	5' -CAg 3'	5' -gCA 3'
			418	209	368	363	206					418
			5' -Agg 3'	5' -ggg 3'	5' -gTT 3'	5' -AgC 3'	5' -gAA 3'					5' -Agg 3'
			499	355								
			5' -TCT 3'	5' -TCA 3'								
3'-primer(s)[3]	603	282	538	299	282	259	272	435	309	311	259	207
	5' -gTg 3'	5' -gCC 3'	5' -gTC 3'	5' -TCA 3'	5' -gCC 3'	5' -gTT 3'	5' -TgT 3'	5' -TCT 3'	5' -ATC 3'	5' -ggT 3'	5' -CTC 3'	5' -TCC 3'
	603		572	583	418	499	309	527			259	226
	5' -gTg 3'		5' -gCA 3'	5' -gTg 3'	5' -gTC 3'	5' -ggA 3'	5' -ATC 3'	5' -CCT 3'			5' -CTC 3'	5' -CAC 3'
	605		572	605							262	538
	5' -gCT 3'		5' -gCg 3'	5' -gCT 3'							5' -TgC 3'	5' -gTC 3'
			573									
			5' -AgT 3'									
Well No.	46	47	48	49	50	51	52	53	54	55	56	57

Well No.	58	59	60	61	62	63	64
Length of spec.	180	180	90	95	150	360	350
PCR product	210	205	240				
Length of int.	1070	1070	800	1070	1070	1070	1070
pos. control[1]							
5'-primer(s)[2]	141	97	209	206	165	1st I	1st I
	5' -ATT 3'	5' -TCg 3'	5' -ggC 3'	5' -gAC 3'	5' -ACC 3'	5' -CAg 3'	5' -CAg 3'
	420	420	209		463		
	5' -TTA 3'	5' -TTA 3'	5' -ggA 3'		5' -TgA 3'		
			362				
			5' -ggT 3'				
3'-primer(s)[3]	311	259	256	259	272	317	311
	5' -ggT 3'	5' -gTT 3'	5' -CCC 3'	5' -gTT 3'	5' -TgC 3'	5' -ggA 3'	5' -ggT 3'
	559	559	259		538	320	
	5' -CgT 3'	5' -CAg 3'	5' -CTT 3'		5' -CCA 3'	5' -AgT 3'	
			263				
			5' -gTT 3'				
			559				
			5' -CgT 3'				
Well No.	58	59	60	61	62	63	64

[1]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 1070 or 800 base pairs respectively, well distribution as outlined in the table. Well number 22 contains the shorter, 800 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

[2]The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[3]The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

DR LOW PRIMER SPECIFICATION

Well No.	65	66	67	68	69	70	71	72	73	74	75	76
Length of spec.	210	200	200	210	125	75	85	100	180	120	85	175
PCR product	235		230		230	210	210	175	205	215	100	
	260								230	250	135	
											165	
											195	
Length of int.	515	430	430	430	515	430	430	430	430	515	430	430
pos. control[1]												
5'-primer(s)[2]	13(124)	14(129)	12(121)	11(119)	13(125)	13(125)	13(125)	13(124)	11(118)	16(133)	26(165)	26(164)
	5' -A.T 3'	5' -gAA 3'	5' -CTg 3'	5' -gCT 3'	5' -gTC 3'	5' -gTC 3'	5' -gTC 3'	5' -AAC 3'	5' -AgA 3'	5' -gTT 3'	5' -TAT 3'	5' -gTA 3'
	14(129)		13(126)	13(126)	47(227)	16(133)		13(125)	14(127)	16(133)	37(196)	31(178)
	5' -gAA 3'		5' -Agg 3'	5' -Agg 3'	5' -gTT 3'	5' -gTT 3'		5' -ATA 3'	5' -gTA 3'	5' -gTT 3'	5' -AgA 3'	5' -gCg 3'
			13(126)	13(126)				13(125)	14(127)	16(133)	58(261)	
			5' -AAg 3'	5' -AAg 3'				5' -gTC 3'	5' -ATA 3'	5' -gCT 3'	5' -gAg 3'	
			13(126)						14(127)	60(265)		
			5' -AgA 3'						5' -ATA 3'	5' -AgT 3'		
									16(133)			
									5' -gTT 3'			
									31(178)			
									5' -gCg 3'			
3'-primer(s)[3]	67(286)	67(286)	67(286)	67(286)	73(305)	26(164)	28(171)	33(184)	71(298)	74(307)	57(257)	72(303)
	5' -gAg 3'	5' -gAT 3'	5' -gAT 3'	5' -gAA 3'	5' -ggC 3'	5' -ggT 3'	5' -CTC 3'	5' -gTg 3'	5' -CTC 3'	5' -CAg 3'	5' -CgA 3'	5' -gCA 3'
	67(286)		67(286)	67(286)	73(305)	67(286)	70(295)	58(260)	73(305)	86(344)	73(305)	74(307)
	5' -gAg 3'		5' -gAT 3'	5' -gAg 3'	5' -ggC 3'	5' -gAT 3'	5' -CTg 3'	5' -Cgg 3'	5' -ggC 3'	5' -CAC 3'	5' -ggC 3'	5' -CgC 3'
	67(286)		67(286)	70(296)	73(305)	71(299)			77(317)		78(319)	74(308)
	5' -gAT 3'		5' -gAT 3'	5' -TgT 3'	5' -ggC 3'	5' -gCT 3'			5' -AAT 3'		5' -CAC 3'	5' -CCT 3'
	70(297)		70(295)	72(302)	73(305)				78(319)			
	5' -CTg 3'		5' -CTg 3'	5' -Cgg 3'	5' -ggC 3'				5' -CgC 3'			
	71(299)		70(295)		73(306)				78(319)			
	5' -gCg 3'		5' -.Tg 3'		5' -Tgg 3'				5' -CAA 3'			
	77(317)		70(296)		74(308)				78(319)			
	5' -AgT 3'		5' -TCC 3'		5' -CCC 3'				5' -CAC 3'			
	86(344)		71(299)		75(310)							
	5' -CCA 3'		5' -gCg 3'		5' -CAA 3'							
			71(299)		77(317)							
			5' -gCT 3'		5' -AgT 3'							
			72(301)									
			5' -.Cg 3'									
			73(305)									
			5' -ggC 3'									
			77(317)									
			5' -AgT 3'									
Well No.	65	66	67	68	69	70	71	72	73	74	75	76

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

Well No.	77	78	79	80	81	82	83	84	85	86	87
Length of spec.	100	90	210	195	175	100	110	110	80	130	175
PCR product	170	110	235	225	240	150	140	150	160	215	
						195	150	180	240		
						240	175	220			
Length of int.	430	430	430	430	430	430	430	430	430	430	430
pos. control[1]											
5'-primer(s)[2]	13(125)	13(124)	10(116)	10(116)	13(125)	5(101)	26(164)	13(125)	10(116)	28(170)	9(112)
	5' -gTC 3'	5' -Cgg 3'	5' -gCT 3'	5' -gCT 3'	5' -gTC 3'	5' -CAA 3'	5' -gTA 3'	5' -gTC 3'	5' -gCT 3'	5' -gAT 3'	5' -TgC 3'
	16(133)	16(133)	12(122)	12(122)	13(125)	37(197)	34(189)	34(189)	10(116)	28(170)	13(125)
	5' -gTC 3'	5' -gTT 3'	5' -TAT 3'	5' -TAT 3'	5' -gTg 3'	5' -gTT 3'	5' -CAg 3'	5' -CAg 3'	5' -gCT 3'	5' -gAg 3'	5' -gTA 3'
	38(200)		13(125)	12(123)	114(429)	37(197)	34(189)	37(196)	11(119)	105(401)	
	5' -CgT 3'		5' -gTC 3'	5' -ACA 3'	5' -CTg 3'	5' -gTA 3'	5' -CAg 3'	5' -AgC 3'	5' -gCT 3'	5' -AAA 3'	
				13(125)			34(189)		38(199)		
				5' -gTC 3'			5' -CCg 3'		5' -TCC 3'		
				13(125)							
				5' -gTg 3'							
				16(133)							
				5' -gTC 3'							
				16(133)							
				5' -gTT 3'							
3'-primer(s)[3]	58(260)	28(171)	70(295)	67(286)	58(260)	42(213)	57(257)	57(257)	51(239)	87(346)	57(256)
	5' -CCT 3'	5' -CTC 3'	5' -gTC 3'	5' -gAA 3'	5' -Cgg 3'	5' -TCA 3'	5' -CAg 3'	5' -CAg 3'	5' -CCC 3'	5' -CTC 3'	5' -gTC 3'
	58(260)	30(175)	71(299)	71(298)	58(260)	57(257)	70(295)	60(265)	77(317)	87(346)	57(258)
	5' -CCT 3'	5' -gTg 3'	5' -gCT 3'	5' -CTC 3'	5' -CAg 3'	5' -CAg 3'	5' -CTg 3'	5' -gTg 3'	5' -AAT 3'	5' -CTT 3'	5' -gCg 3'
	58(260)	38(199)	71(299)	71(298)	181(630)	71(298)	70(296)	70(296)		135(490)	58(260)
	5' -CCT 3'	5' -CAg 3'	5' -ACT 3'	5' -CgC 3'	5' -CTT 3'	5' -CgC 3'	5' -TCC 3'	5' -TCC 3'		5' -gCT 3'	5' -CCT 3'
	58(261)		74(307)					74(307)			
	5' -TCT 3'		5' -CgT 3'					5' -CAg 3'			
			78(319)								
			5' -CAC 3'								
Well No.	77	78	79	80	81	82	83	84	85	86	87

[1]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 65 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

[2]The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

[3]The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

DQ LOW PRIMER SPECIFICATION

Well No.	88	89	90	91	92	93	94	95
Length of spec.	135	65	210	220	130	135	85	135
PCR product	230	110			220		185	170
		135						205
		160						
		185						
		220						
		270						
Length of int.	515	515	430	515	515	515	515	430
pos. control[1]								
5'-primer(s)[2]	25(170)	9(122)	28(178)	26(173)	28(179)	26(173)	38(210)	21(159)
	5' -gCT 3'	5' -gTT 3'	5' -TgC 3'	5' -TTA 3'	5' -gAC 3'	5' -TCT 3'	5' -gCA 3'	5' -ACC 3'
	26(172)	9(122)	30(184)		28(179)		48(240)	23(164)
	5' -ggA 3'	5' -gCT 3'	5' -gAg 3'		5' -gAC 3'		5' -CgC 3'	5' -gCT 3'
	26(173)	25(169)	30(185)		28(179)		55(260)	38(210)
	5' -ggg 3'	5' -TgT 3'	5' -AAg 3'		5' -gAC 3'		5' -gCC 3'	5' -gCg 3'
	26(173)	26(172)	30(185)				71(309)	
	5' -ggA 3'	5' -ATC 3'	5' -AAA 3'				5' -ACC 3'	
	26(173)	26(173)					71(309)	
	5' -ggg 3'	5' -TTA 3'					5' -AgC 3'	
		26(173)						
		5' -TCT 3'						
		48(240)						
		5' -CgC 3'						
3'-primer(s)[3]	57(266)	48(240)	86(353)	55(260)	57(266)	57(266)	86(353)	70(304)
	5' -CAA 3'	5' -gCg 3'	5' -gCT 3'	5' -gCg 3'	5' -Cgg 3'	5' -CgT 3'	5' -gCT 3'	5' -CTC 3'
	87(356)	57(266)		86(353)	57(266)		86(354)	77(327)
	5' -ggT 3'	5' -CAA 3'		5' -gCT 3'	5' -CAg 3'		5' -AgT 3'	5' -ACg 3'
	87(356)	86(353)		86(354)	57(266)		86(354)	
	5' -ggA 3'	5' -ACg 3'		5' -AgT 3'	5' -Cgg 3'		5' -Agg 3'	
	87(356)	86(353)			87(356)		87(355)	
	5' -ggT 3'	5' -ACC 3'			5' -ggg 3'		5' -gAC 3'	
	89(361)	86(354)					87(356)	
	5' -CCT 3'	5' -TAT 3'					5' -ggC 3'	
		86(354)					88(358)	
		5' -AAA 3'					5' -gCC 3'	
		86(354)						
		5' -AAg 3'						
		86(354)						
		5' -AAT 3'						
Well No.	88	89	90	91	92	93	94	95

[1]The internal positive control primer pairs amplify segments of the human growth hormone gene. The internal positive control bands are 430 or 515 base pairs respectively, well distribution as outlined in the table. Well number 88 contains the longer, 515 bp, internal positive control band. The well distribution of the internal controls can help in orientation of the kit on gel photo, as well as allow for kit identification. In the presence of a specific amplification the intensity of the control band often decreases.

[2]The nucleotide position matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

[3]The nucleotide position matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

HLA-A low resolution primer set[2]

					Well															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				Prod. No.:	201900801	201900802	201900803	201900804	201900806	201900807	201900808	201900809	201900810	201900811	201900812	201900813	201900814	201900815	201900816	201900817
	IHWC cell line[1]		A*	A*																
1	9001	SA	*24:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011	E4181324	*01:01		+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*30:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
5	9009	KAS011	*01:01		+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*02:01	*26:03	-	+	-	-	-	-	+	-	-	+	-	+	-	-	-	-
7	9020	QBL	*26:01		-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-
8	9025	DEU	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
9	9026	YAR	*26:01		-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-
10	9107	LKT3	*24:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
12	9052	DBB	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
15	9075	DKB	*24:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
17	9282	CTM3953540	*03:01	*80:01	-	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-
18	9257	32367	*33:03	*74:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*02:17		-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*02:01	*34:01	-	+	-	-	-	-	+	-	-	+	+	-	-	-	-	-
24	9035	JBUSH	*32:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
25	9049	IBW9	*33:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*02:05		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*24:10	*29:01	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-
28	9320	BEL5GB	*02:01	*29:02	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
29	9050	MOU	*29:02		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
30	9021	RSH	*30:01	*68:02	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-
31	9019	DUCAF	*30:02		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
32	9297	HAG	*02:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
34	9104	DHIF	*31:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
35	9302	SSTO	*32:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
36	9024	KT17	*02:06	*11:01	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-
37	9065	HHKB	*03:01		-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
38	9099	LZL	*02:17		-	+	-	-	-	W	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*01:01	*03:01	+	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-
40	9134	WHONP199	*02:07	*30:01	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-
41	9055	H0301	*03:01		-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
42	9066	TAB089	*02:07		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*02:06	*02:07	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*66:01		-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-
45	9239	SHJO	*23:01	*24:02	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
46	9013	SCHU	*03:01		-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
47	9045	TUBO	*02:16	*03:01	-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-
48	9303	TER-ND	*02:01	*11:01	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

HLA-A low resolution primer set[2]

					Well				
					17	18	19	20	21
				Prod. No.:	201900818	201900819	201900820	201900821	201900823
	IHWC cell line[1]		A*	A*					
1	9001	SA	*24:02		-	-	-	-	-
2	9280	LK707	*02:01		-	-	-	-	-
3	9011	E4181324	*01:01		-	-	-	-	-
4	9275	GU373	*30:01		-	-	-	-	-
5	9009	KAS011	*01:01		-	-	-	-	-
6	9353	SM	*02:01	*26:03	-	-	-	-	+
7	9020	QBL	*26:01		-	-	-	-	-
8	9025	DEU	*31:01		-	-	-	-	-
9	9026	YAR	*26:01		-	-	-	-	-
10	9107	LKT3	*24:02		-	-	-	-	-
11	9051	PITOUT	*29:02		-	-	-	-	-
12	9052	DBB	*02:01		-	-	-	-	-
13	9004	JESTHOM	*02:01		-	-	-	-	-
14	9071	OLGA	*31:01		-	-	-	-	-
15	9075	DKB	*24:02		-	-	-	-	-
16	9037	SWEIG007	*29:02		-	-	-	-	-
17	9282	CTM3953540	*03:01	*80:01	-	-	-	-	+
18	9257	32367	*33:03	*74:01	+	+	-	-	-
19	9038	BM16	*02:01		-	-	-	-	-
20	9059	SLE005	*02:01		-	-	-	-	-
21	9064	AMALA	*02:17		-	-	-	+	-
22	9056	KOSE	*02:01		-	-	-	-	-
23	9124	IHL	*02:01	*34:01	-	-	-	-	-
24	9035	JBUSH	*32:01		-	-	-	-	-
25	9049	IBW9	*33:01		+	-	-	-	-
26	9285	WT49	*02:05		-	-	-	-	-
27	9191	CH1007	*24:10	*29:01	-	-	-	-	-
28	9320	BEL5GB	*02:01	*29:02	-	-	-	-	-
29	9050	MOU	*29:02		-	-	-	-	-
30	9021	RSH	*30:01	*68:02	-	-	-	-	-
31	9019	DUCAF	*30:02		-	-	-	-	-
32	9297	HAG	*02:01		-	-	-	-	-
33	9098	MT14B	*31:01		-	-	-	-	-
34	9104	DHIF	*31:01		-	-	-	-	-
35	9302	SSTO	*32:01		-	-	-	-	-
36	9024	KT17	*02:06	*11:01	-	-	-	-	-
37	9065	HHKB	*03:01		-	-	-	-	-
38	9099	LZL	*02:17		-	-	-	-	-
39	9315	CML	*01:01	*03:01	-	-	-	-	-
40	9134	WHONP199	*02:07	*30:01	-	-	-	-	-
41	9055	H0301	*03:01		-	-	-	-	-
42	9066	TAB089	*02:07		-	-	-	-	-
43	9076	T7526	*02:06	*02:07	-	-	-	-	-
44	9057	TEM	*66:01		-	-	-	-	-
45	9239	SHJO	*23:01	*24:02	-	-	-	-	-
46	9013	SCHU	*03:01		-	-	-	-	-
47	9045	TUBO	*02:16	*03:01	-	-	-	-	-
48	9303	TER-ND	*02:01	*11:01	-	-	-	-	-

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[1]The provided cell line HLA specificities are retrieved from the http://www.ihwg.org/hla web site. The specificity of an individual cell line may thus be subject to change.

[2]The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solutions 4, 6, 7, 11, 13 to 16 and 19 to 21 were tested by separately adding one or more 3'-primers, respectively one, two or three 5'-primers. Additional 5'-primers in primer solution 1, 8, 12 and 18 were tested by separately adding one or two 3'-primers. Additional 3'-primers in primer solutions 3 and 17 were tested by separately adding one or two 5'-primers.

In primer solutions 2, 3, 8, 10, 11 and 14 one or two 5'-primers were not possible to test, and in primer solutions 3, 5, 7, 8, 9, 11, 12, 15 and 17 one or two 3'-primers were not possible to test.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

HLA-B low resolution SSP kit[2]

					Well															
					22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
				Prod. No.:	201890648	201890602	201890603	201899904	201890605	201890606	201899907	201890608	201893409	201890610	201890611	201890613	201890614	201890615	201890616	201890617
	IHWC cell line[1]		B*																	
1	9001	SA	*07:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*52:01	*73:01	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
3	9011	E4181324	*52:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4	9275	GU373	*15:10	*53:01	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	+
5	9009	KAS011	*37:01		-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+
6	9353	SM	*39:01	*51:01	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-
7	9020	QBL	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
8	9025	DEU	*35:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
9	9026	YAR	*38:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*54:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*44:03		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
12	9052	DBB	*57:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
13	9004	JESTHOM	*27:05		-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-
14	9071	OLGA	*15:01	*15:20	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+
15	9075	DKB	*40:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*40:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*08:01	*55:01	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
18	9257	32367	*14:01	*56:01	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
20	9059	SLE005	*40:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*15:01		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*35:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
23	9124	IHL	*40:02	*56:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*38:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*14:02		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*58:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
27	9191	CH1007	*07:05	*51:01	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
28	9320	BEL5GB	*44:02	*44:03	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
29	9050	MOU	*44:03		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
30	9021	RSH	*42:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
31	9019	DUCAF	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
32	9297	HAG	*41:02		-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
33	9098	MT14B	*40:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*38:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*44:02		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
36	9024	KT17	*15:01	*35:01	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+
37	9065	HHKB	*07:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*15:01		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
39	9315	CML	*08:01	*27:05	-	+	-	-	+	-	-	+	-	-	-	-	-	-	+	-
40	9134	WHONP199	*13:02	*46:01	-	-	+	+	-	-	+	-	-	+	-	-	-	-	-	-
41	9055	H0301	*14:02		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*46:01		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
43	9076	T7526	*46:01		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
44	9057	TEM	*38:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*42:01	*50:01	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
46	9013	SCHU	*07:02		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*51:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
48	9303	TER-ND	*35:01	*44:03	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

HLA-B low resolution SSP kit[2]

					Well															
					38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
				Prod. No.:	201890618	201890619	201890620	201890621	201890622	201890623	201890624	201890625	201890627	201890628	201890629	201890631	201890632	201890633	201890634	201890635
	IHWC cell line[1]		B*																	
1	9001	SA	*07:02		-	-	+	-	-	-	+	-	-	+	-	-	-	-	-	-
2	9280	LK707	*52:01	*73:01	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+
3	9011	E4181324	*52:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
4	9275	GU373	*15:10	*53:01	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*37:01		-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-
6	9353	SM	*39:01	*51:01	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+
7	9020	QBL	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*35:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026	YAR	*38:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*54:01		-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
11	9051	PITOUT	*44:03		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
12	9052	DBB	*57:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*27:05		-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
14	9071	OLGA	*15:01	*15:20	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*40:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*08:01	*55:01	-	-	-	-	-	-	+	-	+	+	-	-	+	-	-	+
18	9257	32367	*14:01	*56:01	-	-	-	-	-	+	+	-	-	+	-	-	+	-	-	-
19	9038	BM16	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
21	9064	AMALA	*15:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*35:03		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*40:02	*56:02	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
24	9035	JBUSH	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*14:02		-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
26	9285	WT49	*58:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:05	*51:01	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+
28	9320	BEL5GB	*44:02	*44:03	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
29	9050	MOU	*44:03		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
30	9021	RSH	*42:01		-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-
31	9019	DUCAF	*18:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*41:02		-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
33	9098	MT14B	*40:01		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
34	9104	DHIF	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*44:02		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
36	9024	KT17	*15:01	*35:01	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
38	9099	LZL	*15:01		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*08:01	*27:05	-	-	-	-	-	-	+	-	+	+	-	-	+	-	-	-
40	9134	WHONP199	*13:02	*46:01	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
41	9055	H0301	*14:02		-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*46:01		-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
43	9076	T7526	*46:01		-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
44	9057	TEM	*38:01		-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*42:01	*50:01	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	+
46	9013	SCHU	*07:02		-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
47	9045	TUBO	*51:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
48	9303	TER-ND	*35:01	*44:03	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

HLA-B low resolution SSP kit[2]

					Well										
					54	55	56	57	58	59	60	61	62	63	64
				Prod. No.:	201890636	201890637	201899938	201899939	201890640	201899941	201890642	201890644	201890645	201890646	201890647
	IHWC cell line[1]		B*												
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	-	-	+
2	9280	LK707	*52:01	*73:01	+	-	+	-	-	-	-	-	-	+	-
3	9011	E4181324	*52:01		+	-	+	-	-	-	-	-	+	+	+
4	9275	GU373	*15:10	*53:01	+	-	-	-	-	-	-	+	-	+	+
5	9009	KAS011	*37:01		-	-	+	-	-	-	-	-	-	+	-
6	9353	SM	*39:01	*51:01	+	-	-	-	-	-	-	+	-	+	+
7	9020	QBL	*18:01		-	-	-	-	-	-	-	+	-	-	+
8	9025	DEU	*35:01		-	-	-	-	-	-	-	+	-	-	+
9	9026	YAR	*38:01		-	-	-	-	-	-	-	-	-	+	-
10	9107	LKT3	*54:01		-	-	-	+	+	-	-	-	-	-	+
11	9051	PITOUT	*44:03		-	-	+	-	-	-	-	-	-	+	-
12	9052	DBB	*57:01		+	-	-	-	-	-	+	-	-	+	-
13	9004	JESTHOM	*27:05		-	-	+	-	-	-	-	-	-	+	-
14	9071	OLGA	*15:01	*15:20	-	-	+	-	-	-	-	-	+	-	+
15	9075	DKB	*40:01		-	+	+	-	-	-	-	-	-	-	+
16	9037	SWEIG007	*40:02		-	+	+	-	-	-	-	-	-	-	+
17	9282	CTM3953540	*08:01	*55:01	-	-	-	-	+	-	-	-	-	-	+
18	9257	32367	*14:01	*56:01	-	-	-	-	-	+	-	-	-	-	+
19	9038	BM16	*18:01		-	-	-	-	-	-	-	+	-	-	+
20	9059	SLE005	*40:01		-	+	+	-	-	-	-	-	-	-	+
21	9064	AMALA	*15:01		-	-	+	-	-	-	-	-	+	-	+
22	9056	KOSE	*35:03		-	-	-	-	-	-	-	+	-	-	+
23	9124	IHL	*40:02	*56:02	-	+	+	-	-	+	-	-	-	-	+
24	9035	JBUSH	*38:01		-	-	-	-	-	+	-	-	-	+	-
25	9049	IBW9	*14:02		-	-	-	-	-	-	-	-	-	-	+
26	9285	WT49	*58:01		+	-	-	-	-	-	-	-	-	+	-
27	9191	CH1007	*07:05	*51:01	+	-	-	-	-	-	-	+	-	+	+
28	9320	BEL5GB	*44:02	*44:03	-	-	+	+	-	-	-	-	-	+	-
29	9050	MOU	*44:03		-	-	+	-	-	-	-	-	-	+	-
30	9021	RSH	*42:01		-	-	-	-	-	-	-	-	-	-	+
31	9019	DUCAF	*18:01		-	-	-	-	-	-	-	+	-	-	+
32	9297	HAG	*41:02		-	+	+	-	-	-	-	-	-	-	+
33	9098	MT14B	*40:01		-	+	+	-	-	-	-	-	-	-	+
34	9104	DHIF	*38:01		-	-	-	-	-	-	-	-	-	+	-
35	9302	SSTO	*44:02		-	-	+	+	-	-	-	-	-	+	-
36	9024	KT17	*15:01	*35:01	-	-	+	-	-	-	-	+	+	-	+
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	+
38	9099	LZL	*15:01		-	-	+	-	-	-	-	-	+	-	+
39	9315	CML	*08:01	*27:05	-	-	+	-	-	-	-	-	-	+	+
40	9134	WHONP199	*13:02	*46:01	-	-	+	-	-	-	-	-	+	+	+
41	9055	H0301	*14:02		-	-	-	-	-	-	-	-	-	-	+
42	9066	TAB089	*46:01		-	-	-	-	-	-	-	-	+	-	+
43	9076	T7526	*46:01		-	-	-	-	-	-	-	-	+	-	+
44	9057	TEM	*38:01		-	-	-	-	-	-	-	-	-	+	-
45	9239	SHJO	*42:01	*50:01	-	+	+	-	-	+	-	-	-	-	+
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	+
47	9045	TUBO	*51:01		+	-	-	-	-	-	-	+	-	+	-
48	9303	TER-ND	*35:01	*44:03	-	-	+	-	-	-	-	+	-	+	+

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[1]The provided cell line HLA specificities are retrieved from the http://www.ihwg.org/hla web site. The specificity of an individual cell line may thus be subject to change.

[2]The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solutions 24, 27, 32, 34, 39, 48, 49, 58 and 59 were tested by separately adding one or two additional 3'-primers, respectively one or two additional 5'-primers. Additional 3'-primers in primer solutions 23, 29, 33, 35, 38 and 52 were tested by separately adding one or two additional 5'-primers. Additional 5'-primers in primer solutions 22, 41 and 45 were tested by separately adding one additional 3'-primer.

In primer mixes 32, 37, 49 and 60 one 5'-primer was not possible to test, and in primer mixes 24, 42, 46, 48, 56, 57, 60 and 63 one or two 3'-primers were not possible to test.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

DR low resolution primer set[3]

					Well[2]															
					65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
				Prod. No.:	201894201	201894202	201800303	201894204	201894205	201894206	201894207	201800308	201894209	201800310	201894211	201894212	201894213	201894214	201894215	201894216
	IHWC cell line[1]		DRB1																	
1	9001	SA	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*15:02	*04:05	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
3	9011	E4181324	*15:02		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*16:01		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*04:07	*08:03	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-
7	9020	QBL	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*04:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
9	9026	YAR	*04:02		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
10	9107	LKT3	*04:05		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
11	9051	PITOUT	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
12	9052	DBB	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
13	9004	JESTHOM	*01:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*08:02		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
15	9075	DKB	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
16	9037	SWEIG007	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
17	9282	CTM3953540	*03:01	*13:01	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+
18	9257	32367	*09:01	*11:01	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+
19	9038	BM16	*12:01		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
20	9059	SLE005	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
21	9064	AMALA	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*13:02	*14:01	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
23	9124	IHL	*08:03	*14:14	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
24	9035	JBUSH	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
25	9049	IBW9	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
26	9285	WT49	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*04:05	*10:01	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
28	9320	BEL5GB	*04:16	*07:01	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
29	9050	MOU	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
30	9021	RSH	*03:02		-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-
31	9019	DUCAF	*03:01		-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*13:03		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
33	9098	MT14B	*04:04		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
34	9104	DHIF	*11:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
35	9302	SSTO	*04:03		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
36	9024	KT17	*04:03	*04:06	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
37	9065	HHKB	*13:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
38	9099	LZL	*14:02		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
39	9315	CML	*03:01	*04:01	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
40	9134	WHONP199	*07:01	*09:01	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
41	9055	H0301	*13:02		-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
42	9066	TAB089	*08:03		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
43	9076	T7526	*09:01		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
44	9057	TEM	*14:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*07:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
46	9013	SCHU	*15:01		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*11:04	*12:01	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
48	9303	TER-ND	*01:03		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CE 0197

For *In Vitro* Diagnostic Use.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

DR low resolution primer set[3]

					Well[2]						
					81	82	83	84	85	86	87
				Prod. No.:	201894217	201800318	201902019	201894220	201800329	201894230	201800331
	IHWC cell line[1]		DRB1								
1	9001	SA	*01:01		-	-	-	-	-	-	-
2	9280	LK707	*15:02	*04:05	-	-	-	-	-	+	+
3	9011	E4181324	*15:02		-	-	-	-	-	-	+
4	9275	GU373	*03:01		+	-	-	-	+	-	-
5	9009	KAS011	*16:01		-	-	-	-	-	-	+
6	9353	SM	*04:07	*08:03	-	-	-	-	-	+	-
7	9020	QBL	*03:01		+	-	-	-	+	-	-
8	9025	DEU	*04:01		-	-	-	-	-	+	-
9	9026	YAR	*04:02		-	-	-	-	-	+	-
10	9107	LKT3	*04:05		-	-	-	-	-	+	-
11	9051	PITOUT	*07:01		-	-	-	-	-	+	-
12	9052	DBB	*07:01		-	+	-	-	-	+	-
13	9004	JESTHOM	*01:01		-	-	-	-	-	-	-
14	9071	OLGA	*08:02		-	-	-	-	-	-	-
15	9075	DKB	*09:01		-	-	+	-	-	+	-
16	9037	SWEIG007	*11:01		-	-	-	-	+	-	-
17	9282	CTM3953540	*03:01	*13:01	+	-	-	-	+	-	-
18	9257	32367	*09:01	*11:01	-	-	+	-	+	+	-
19	9038	BM16	*12:01		-	-	-	-	+	-	-
20	9059	SLE005	*13:02		+	-	-	-	+	-	-
21	9064	AMALA	*14:02		+	-	+	-	+	-	-
22	9056	KOSE	*13:02	*14:01	+	+	+	+	+	-	-
23	9124	IHL	*08:03	*14:14	+	-	+	+	+	-	-
24	9035	JBUSH	*11:01		-	-	-	-	+	-	-
25	9049	IBW9	*07:01		-	-	-	-	-	+	-
26	9285	WT49	*03:01		+	-	-	-	+	-	-
27	9191	CH1007	*04:05	*10:01	-	-	-	-	-	+	-
28	9320	BEL5GB	*04:16	*07:01	-	-	-	-	-	+	-
29	9050	MOU	*07:01		-	-	-	-	-	+	-
30	9021	RSH	*03:02		+	-	-	-	+	-	-
31	9019	DUCAF	*03:01		+	-	-	-	+	-	-
32	9297	HAG	*13:03		+	-	-	-	+	-	-
33	9098	MT14B	*04:04		-	-	-	-	-	+	-
34	9104	DHIF	*11:01		-	-	-	-	+	-	-
35	9302	SSTO	*04:03		-	-	-	-	-	+	-
36	9024	KT17	*04:03	*04:06	-	-	-	-	-	+	-
37	9065	HHKB	*13:01		+	-	-	-	+	-	-
38	9099	LZL	*14:02		+	-	+	-	+	-	-
39	9315	CML	*03:01	*04:01	+	-	-	-	+	+	-
40	9134	WHONP199	*07:01	*09:01	-	-	+	-	-	+	-
41	9055	H0301	*13:02		+	-	-	-	+	-	-
42	9066	TAB089	*08:03		-	-	-	-	-	-	-
43	9076	T7526	*09:01		-	-	+	-	-	+	-
44	9057	TEM	*14:01		-	+	+	+	+	-	-
45	9239	SHJO	*07:01		-	-	-	-	+	+	-
46	9013	SCHU	*15:01		-	-	-	-	-	-	+
47	9045	TUBO	*11:04	*12:01	-	-	-	-	+	-	-
48	9303	TER-ND	*01:03		-	-	-	-	-	-	-

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[1]The provided cell line HLA specificities are retrieved from the http://www.ihwg.org/hla web site. The specificity of an individual cell line may thus be subject to change.
[2]The DRB4*01:03:01:02N allele is amplified by primer mix 82 in the DBB/9052 cell line.
[3]The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.
The specificities of the primers in primer solutions 73, 75, 76, 79 and 82 were tested by separately adding one 3'-primer, respectively one or three 5'-primers.
Additional 5'-primers in primer solutions 68, 70 and 80 were tested by separately adding one 3'-primer. Additional 3'-primers in primer solutions 65, 67, 69 and 84 were tested by separately adding one or more 5'-primers.
One or more of the 5'-primers in primer solution 65, 67, 68, 72 to 74, 77 to 81, 83, 84 and 86 were not possible to test. One or more of the 3'-primers in primer solution 65, 67 to 70, 73, 77, 79, 86 and 87 were not possible to test.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

CELL LINE VALIDATION SHEET

DQ low resolution primer set[2]

					Well							
					88	89	90	91	92	93	94	95
				Prod. No.:	201902101	201902102	201785503	201902104	201785505	201788306	201902107	201784808
	IHWC cell line[1]		DQB1									
1	9001	SA	*05:01		+	-	-	-	-	-	-	-
2	9280	LK707	*06:01	*02:02	-	+	+	-	-	-	-	-
3	9011	E4181324	*06:01		-	+	-	-	-	-	-	-
4	9275	GU373	*02:01		-	-	+	-	-	-	-	-
5	9009	KAS011	*05:02		+	-	-	-	-	-	-	-
6	9353	SM	*03:02	*06:01	-	+	-	-	+	-	+	-
7	9020	QBL	*02:01		-	-	+	-	-	-	-	-
8	9025	DEU	*03:01		-	-	-	+	-	-	+	-
9	9026	YAR	*03:02		-	-	-	-	+	-	+	-
10	9107	LKT3	*04:01		-	-	-	-	-	-	-	+
11	9051	PITOUT	*02:02		-	-	+	-	-	-	-	-
12	9052	DBB	*03:03		-	-	-	-	-	+	+	-
13	9004	JESTHOM	*05:01		+	-	-	-	-	-	-	-
14	9071	OLGA	*04:02		-	-	-	-	-	-	-	+
15	9075	DKB	*03:03		-	-	-	-	-	+	+	-
16	9037	SWEIG007	*03:01		-	-	-	+	-	-	+	-
17	9282	CTM 3953540	*02:01	*06:03	-	+	+	-	-	-	-	-
18	9257	32367	*06:02	*02:02	-	+	+	-	-	-	-	-
19	9038	BM16	*03:01		-	-	-	+	-	-	+	-
20	9059	SLE005	*06:04		-	+	-	-	-	-	-	-
21	9064	AMALA	*03:01		-	-	-	+	-	-	+	-
22	9056	KOSE	*05:03	*06:04	+	+	-	-	-	-	-	-
23	9124	IHL	*05:03	*06:01	+	+	-	-	-	-	-	-
24	9035	JBUSH	*03:01		-	-	-	+	-	-	+	-
25	9049	IBW9	*02:02		-	-	+	-	-	-	-	-
26	9285	WT49	*02:01		-	-	+	-	-	-	-	-
27	9191	CH1007	*04:01	*05:01	+	-	-	-	-	-	-	+
28	9320	BEL5GB	*02:02	*03:01	-	-	+	+	-	-	+	-
29	9050	MOU	*02:02		-	-	+	-	-	-	-	-
30	9021	RSH	*04:02		-	-	-	-	-	-	-	+
31	9019	DUCAF	*02:01		-	-	+	-	-	-	-	-
32	9297	HAG	*03:01		-	-	-	+	-	-	+	-
33	9098	MT14B	*03:02		-	-	-	-	+	-	+	-
34	9104	DHIF	*03:01		-	-	-	+	-	-	+	-
35	9302	SSTO	*03:05		-	-	-	-	+	-	+	-
36	9024	KT17	*03:02		-	-	-	-	+	-	+	-
37	9065	HHKB	*06:03		-	+	-	-	-	-	-	-
38	9099	LZL	*03:01		-	-	-	+	-	-	+	-
39	9315	CML	*02:01	*03:01	-	-	+	+	-	-	+	-
40	9134	WHONP199	*02:02	*03:03	-	-	+	-	-	+	+	-
41	9055	H0301	*06:09		-	+	-	-	-	-	-	-
42	9066	TAB089	*06:01		-	+	-	-	-	-	-	-
43	9076	T7526	*03:03		-	-	-	-	-	+	+	-
44	9057	TEM	*05:03		+	-	-	-	-	-	-	-
45	9239	SHJO	*02:02		-	-	+	-	-	-	-	-
46	9013	SCHU	*06:02		-	+	-	-	-	-	-	-
47	9045	TUBO	*03:01		-	-	-	+	+	-	+	-
48	9303	TER-ND	*05:01		+	-	-	-	-	-	-	-

101.708-24 – including *Taq* polymerase, IFU-01 Visit https://labproducts.caredx.com for
101.708-24u – without *Taq* polymerase, IFU-02 **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

[1]The provided cell line HLA specificities are retrieved from the http://www.ihwg.org/hla web site. The specificity of an individual cell line may thus be subject to change.

[2]The specificity of each primer solution in the kit has been tested against 48 well characterized cell line DNAs and where applicable, additional cell line DNAs.

The specificities of the primers in primer solution 89 were tested by separately adding one 3'-primer, respectively one 5'-primer.

One additional 5'-primer in primer solution 94 was tested by separately adding one additional 3'-primer and two additional 3'-primers in primer solution 88 were tested by separately adding two additional 5'-primers.

In primer mixes 88 to 90, 92 and 94 one or more 5'-primers were not possible to test, and in primer mixes 88, 89, 91, 92 and 94 one or more 3'-primers were not possible to test.

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

101.708-24 – including *Taq* polymerase, IFU-01
101.708-24u – without *Taq* polymerase, IFU-02

Visit https://labproducts.caredx.com for **"Instructions for Use" (IFU)**

Lot No.: 3H8 **Lot-specific information**

ADDRESSES:

Manufacturer:
Caredx AB, Franzengatan 5, SE-112 51 Stockholm, Sweden.
Tel: +46-8-508 939 00
Fax: +46-8-717 88 18
E-mail: orders-se@caredx.com
Web page: https://labproducts.caredx.com/

Distributed by:
CareDx GmbH, Löwengasse 47 / 6, AT-1030 Vienna, Austria.
Tel: +43-1-710 15 00
Fax: +43-1-710 15 00 10
E-mail: orders-at@caredx.com
Web page: https://labproducts.caredx.com/

CareDx Lab Solutions Inc., 901 S. Bolmar St., Suite R, West Chester, PA 19382
Tel: 1-877-653-78171
Fax: 610-344-7989
E-mail: orders-us@caredx.com
Web page: https://labproducts.caredx.com/

For information on CareDx distributors worldwide, contact **CareDx GmbH**.