

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

Visit www.olerup-ssp.com for
“Instructions for Use” (IFU)

Lot No.: **3D5**

Lot-specific information
Olerup SSP® HLA-C*12

Product number:	101.624-12 – including <i>Taq</i> polymerase 101.624-12u – without <i>Taq</i> polymerase
Lot number:	3D5
Expiry date:	2018-June-01
Number of tests:	12
Number of wells per test:	44+1
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C
- Adhesive PCR seals	RT
- Product Insert	RT

This Product Description is only valid for Lot No. 3D5.

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-C*12 Lot (77X)**

The HLA-C*12 kit is updated for new alleles to enable separation of:

- Confirmed¹ alleles as listed in the IMGT/HLA database
- Polymorphisms in exons outside of the region encoding the peptide binding domain
- Null and Alternatively expressed alleles

A well containing Negative Control primer pairs has been added.

The format of the Product Insert and Worksheet have been changed.

Seven wells have been added to HLA-C*12, **wells 39 to 45**

¹As described in section Uniquely Identified Alleles.

The HLA-C*12 primer set, specificity and interpretation tables have been updated for the HLA-C alleles described since the previous *Olerup SSP®* HLA-C*12 lot was made (**Lot No. 77X**). The kit design is based on IMGT/HLA database 3.22.0.

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As of lot series V, the Specificity Table is included in the lot-specific Product Insert, and the Interpretation Table is included in the Worksheet.

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

Well	5'-primer	3'-primer	rationale
13	Added	-	5'-primer added for the C*12:155Q allele.
17	Added	-	5'-primer added for the C*12:159 allele.
20	-	Added	3'-primers added for the C*12:94 and C*12:139 alleles.
22	Added	-	5'-primer added for the C*12:99 allele.
24	Added	-	5'-primer added for the C*12:99 allele.
25	Added	-	5'-primer added for the C*12:02:12 allele.
27	Added	Added	5'-primer added for the C*12:155Q allele, 3'-primer added for the C*12:94 allele.
30	Added	Added	Primer pair added for the C*12:143 allele.
31	-	Added	3'-primer added for the C*12:123 allele.
32	Added	-	5'-primer added for the C*12:62 allele.
34	Added	-	5'-primer added for the C*12:125 allele.
35	Added	Added	5'-primer added for the C*12:125 allele, primer pair added for the C*12:143 allele.
36	Added	Added	Primer pair added for the C*12:62 allele.
37	-	Added	3'-primer added for the C*12:73 allele.
38	Added	Added	Negative Control moved to well 45, primer pair added for the C*12:113 allele.
39	New	New	New primer pairs added for the C*12:59 and C*12:82 alleles.
40	New	New	New primer pair added for the C*12:72 allele.
41	New	New	New primer pairs added for the C*12:90 and 12:148 alleles.
42	New	New	New primer pair added for the C*12:122 allele.
43	New	New	New primer pair added for the C*12:132 allele.
44	New	New	New primer pair added for the C*12:160 allele.
45	-	-	Updated negative control added from well 38.

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Well **45** 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'-primer¹	164	340	440	45	45	43	36
	5'-CAC ^{3'}	5'-Agg ^{3'}	5'-TTA ^{3'}	5'-Tgg ^{3'}	5'-Tgg ^{3'}	5'-Tgg ^{3'}	5'-TAC ^{3'}
							36
							5'-TAT ^{3'}
3'-primer²	231	2nd I	507	59	58	57	47
	5'-TgC ^{3'}	5'-AAA ^{3'}	5'-TTg ^{3'}	5'-CTC ^{3'}	5'-ggC ^{3'}	5'-CTC ^{3'}	5'-ACA ^{3'}
							48
							5'-gCA ^{3'}
							48
							5'-gCC ^{3'}
							52
							5'-TgT ^{3'}
A*	+	+	+				
B*	+	+	+				
C*	+	+	+				
DRB1				+	+		
DRB3				+	+		
DRB5				+			
DQB1					+		
DPB1						+	
DQA1							+

¹The 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 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.

²The 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.

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Lot-specific information

PRODUCT DESCRIPTION

HLA-C*12 SSP typing

CONTENT

The primer set contains 5'- and 3'-primers for identifying the C*12:02 to C*12:167 alleles.

PLATE LAYOUT

Each HLA-C*12 test consists of 45 PCR reactions in a 48 well cut PCR plate. Wells 46 to 48 are empty.

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	NC	empty	empty	empty

The 48 well PCR plate is marked with 'HLA-C*12' in silver/gray ink.

Well No. 1 is marked with the Lot No. '3D5'.

Wells 1 to 44 – HLA-C*12 high resolution primers.

Well 45 – Negative Control (NC).

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.

The PCR plates are heat-sealed with a PCR-compatible foil.

Please note: When removing each 48 well PCR plate, make sure that the remaining plates stay sealed. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

Due to the sharing of sequence motifs between HLA-C alleles, non-HLA-C*12 alleles will be amplified by primer mixes 1 to 28, 30, 32, 34, 38 to 40 and 43.

In addition, a few HLA-A and HLA-B alleles will be amplified by primer mixes 1, 9, 11, 12, 14, 15, 17, 19, 25, 27, 29, 31, 32, 36 to 39, 41 and 42.

For further details see Specificity Table.

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UNIQUELY IDENTIFIED ALLELES

All the HLA-C*12 alleles, i.e. **C*12:02 to C*12:167**, recognized by the HLA Nomenclature Committee in October 2015^{1,2} will be amplified by the primers in the HLA-C*12 SSP kit³.

The HLA-C*12 kit enables separation of the confirmed HLA-C*12 alleles as listed in the IMGT/HLA database. An HLA allele is listed as confirmed by IMGT/HLA if it has been sequenced by more than a single laboratory or from multiple sources. Current allele confirmation status for HLA-C*12 alleles is listed below.

The HLA-C*12 kit also enables identification of polymorphisms in exons outside of the region encoding the peptide binding domain and of null and alternatively expressed alleles.

The HLA-C*12 subtyping kit cannot distinguish the following silent mutations: the C*12:02:01-12:02:05, 12:02:07, 12:02:09-12:02:11 and 12:02:13 alleles, the C*12:02:06, 12:02:08 and 12:02:12 alleles, the C*12:03:01:01-12:03:01:03, 12:03:03, 12:03:05-12:03:07, 12:03:10-12:03:12, 12:03:14-12:03:15, 12:03:17-12:03:18, 12:03:21-12:03:23, 12:03:25-12:03:29, 12:03:31, 12:03:33 and 12:03:35-12:03:37 alleles, the C*12:03:02, 12:03:08, 12:03:16, 12:03:20 and 12:03:30 alleles, the 12:03:19 and 12:03:32 alleles, the 12:03:34:01-12:03:34:02 alleles or the C*12:10:01-12:10:02 alleles.

The following HLA-C*12 alleles can be distinguished by the different sizes of the HLA-specific PCR product:

Alleles	Primer mix
C*12:03:09, 12:159	17
C*12:06, 12:48, 12:81	6
C*12:29, 12:38	29
C*12:30, 12:36	27
C*12:32, 12:34	30
C*12:45, 12:50	28
C*12:46N, 12:139	20
C*12:86, 12:104N	29

¹HLA-C alleles listed on the IMGT/HLA web page 2015-October-10, release 3.22.0, www.ebi.ac.uk/imgt/hla.

²Alleles 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>.

⁴The HLA-C*12 primer set cannot separate the C*12:09, C*05:16, C*05:85 and C*05:107 alleles, the C*12:16 and C*01:21 alleles, the C*12:18:02 and C*08:21 alleles, the C*12:153 and C*16:15:02 alleles, or the C*12:33 and the C*02:05:01-02:05:03 and 02:17 alleles. These alleles can be distinguished by the HLA-C low resolution kit and the HLA-C*01, HLA-C*02, HLA-C*05, HLA-C*08 or HLA-C*16 kit, respectively.

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ALLELE CONFIRMATION STATUS

Allele	Status ¹	Allele	Status ¹	Allele	Status ¹	Allele	Status ¹
C*12:02:01	Unconfirmed	C*12:03:35	Confirmed	C*12:47	Confirmed	C*12:97	Unconfirmed
C*12:02:02	Confirmed	C*12:03:36	Unconfirmed	C*12:48	Unconfirmed	C*12:98	Unconfirmed
C*12:02:03	Unconfirmed	C*12:03:37	Unconfirmed	C*12:49	Unconfirmed	C*12:99	Confirmed
C*12:02:04	Confirmed	C*12:04:01	Unconfirmed	C*12:50	Confirmed	C*12:100	Unconfirmed
C*12:02:05	Unconfirmed	C*12:04:02	Confirmed	C*12:51	Unconfirmed	C*12:101	Confirmed
C*12:02:06	Unconfirmed	C*12:05	Confirmed	C*12:52	Unconfirmed	C*12:102	Confirmed
C*12:02:07	Unconfirmed	C*12:06	Unconfirmed	C*12:53	Unconfirmed	C*12:103	Unconfirmed
C*12:02:08	Unconfirmed	C*12:07	Confirmed	C*12:54	Confirmed	C*12:104N	Unconfirmed
C*12:02:09	Unconfirmed	C*12:08	Unconfirmed	C*12:55	Unconfirmed	C*12:105N	Unconfirmed
C*12:02:10	Unconfirmed	C*12:09	Confirmed	C*12:56	Unconfirmed	C*12:106	Unconfirmed
C*12:02:11	Unconfirmed	C*12:10:01	Unconfirmed	C*12:57	Unconfirmed	C*12:107	Unconfirmed
C*12:02:12	Confirmed	C*12:10:02	Unconfirmed	C*12:58	Confirmed	C*12:108	Unconfirmed
C*12:02:13	Confirmed	C*12:11	Unconfirmed	C*12:59	Confirmed	C*12:109	Confirmed
C*12:03:01:01	Confirmed	C*12:12	Unconfirmed	C*12:60	Confirmed	C*12:110	Unconfirmed
C*12:03:01:02	Unconfirmed	C*12:13	Confirmed	C*12:61	Unconfirmed	C*12:111	Unconfirmed
C*12:03:01:03	Unconfirmed	C*12:14:01	Unconfirmed	C*12:62	Confirmed	C*12:112	Unconfirmed
C*12:03:02	Unconfirmed	C*12:14:02	Unconfirmed	C*12:63	Confirmed	C*12:113	Confirmed
C*12:03:03	Unconfirmed	C*12:15	Unconfirmed	C*12:64	Unconfirmed	C*12:114	Unconfirmed
C*12:03:04	Confirmed	C*12:16	Confirmed	C*12:65	Unconfirmed	C*12:115	Unconfirmed
C*12:03:05	Confirmed	C*12:17	Unconfirmed	C*12:66	Unconfirmed	C*12:116	Unconfirmed
C*12:03:06	Unconfirmed	C*12:18:01	Confirmed	C*12:67	Unconfirmed	C*12:117	Unconfirmed
C*12:03:07	Unconfirmed	C*12:18:02	Unconfirmed	C*12:68	Unconfirmed	C*12:118	Unconfirmed
C*12:03:08	Confirmed	C*12:19	Confirmed	C*12:69	Unconfirmed	C*12:119	Unconfirmed
C*12:03:09	Confirmed	C*12:20	Unconfirmed	C*12:70	Unconfirmed	C*12:120	Unconfirmed
C*12:03:10	Confirmed	C*12:21	Confirmed	C*12:71	Unconfirmed	C*12:121	Unconfirmed
C*12:03:11	Confirmed	C*12:22	Unconfirmed	C*12:72	Confirmed	C*12:122	Confirmed
C*12:03:12	Confirmed	C*12:23	Confirmed	C*12:73	Confirmed	C*12:123	Confirmed
C*12:03:13	Confirmed	C*12:24	Confirmed	C*12:74	Unconfirmed	C*12:124	Unconfirmed
C*12:03:14	Confirmed	C*12:25	Confirmed	C*12:75	Unconfirmed	C*12:125	Unconfirmed
C*12:03:15	Confirmed	C*12:26	Unconfirmed	C*12:76	Unconfirmed	C*12:126	Unconfirmed
C*12:03:16	Unconfirmed	C*12:27	Confirmed	C*12:77	Unconfirmed	C*12:127	Unconfirmed
C*12:03:17	Confirmed	C*12:28	Confirmed	C*12:78	Unconfirmed	C*12:128	Unconfirmed
C*12:03:18	Confirmed	C*12:29	Unconfirmed	C*12:79	Unconfirmed	C*12:129	Unconfirmed
C*12:03:19	Confirmed	C*12:30	Confirmed	C*12:80N	Unconfirmed	C*12:130	Unconfirmed
C*12:03:20	Unconfirmed	C*12:31	Unconfirmed	C*12:81	Unconfirmed	C*12:131	Unconfirmed
C*12:03:21	Unconfirmed	C*12:32	Unconfirmed	C*12:82	Confirmed	C*12:132	Confirmed
C*12:03:22	Confirmed	C*12:33	Unconfirmed	C*12:83	Unconfirmed	C*12:133	Unconfirmed
C*12:03:23	Confirmed	C*12:34	Confirmed	C*12:84N	Unconfirmed	C*12:134	Unconfirmed
C*12:03:24	Unconfirmed	C*12:35	Confirmed	C*12:85	Unconfirmed	C*12:135	Unconfirmed
C*12:03:25	Unconfirmed	C*12:36	Unconfirmed	C*12:86	Confirmed	C*12:136	Unconfirmed
C*12:03:26	Unconfirmed	C*12:37	Confirmed	C*12:87	Unconfirmed	C*12:137	Unconfirmed
C*12:03:27	Confirmed	C*12:38	Confirmed	C*12:88	Unconfirmed	C*12:138	Unconfirmed
C*12:03:28	Unconfirmed	C*12:39N	Confirmed	C*12:89	Unconfirmed	C*12:139	Confirmed
C*12:03:29	Confirmed	C*12:40	Unconfirmed	C*12:90	Confirmed	C*12:140	Unconfirmed
C*12:03:30	Unconfirmed	C*12:41	Confirmed	C*12:91	Unconfirmed	C*12:141	Unconfirmed
C*12:03:31	Unconfirmed	C*12:42Q	Confirmed	C*12:92	Unconfirmed	C*12:142	Unconfirmed
C*12:03:32	Unconfirmed	C*12:43	Confirmed	C*12:93	Unconfirmed	C*12:143	Unconfirmed
C*12:03:33	Unconfirmed	C*12:44	Confirmed	C*12:94	Confirmed	C*12:144	Unconfirmed
C*12:03:34:01	Unconfirmed	C*12:45	Confirmed	C*12:95	Unconfirmed	C*12:145	Unconfirmed
C*12:03:34:02	Unconfirmed	C*12:46N	Unconfirmed	C*12:96	Unconfirmed	C*12:146	Unconfirmed

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Allele	Status ¹	Allele	Status ¹	Allele	Status ¹
C*12:147	Unconfirmed	C*12:157	Unconfirmed	C*12:167	Unconfirmed
C*12:148N	Unconfirmed	C*12:158	Unconfirmed		
C*12:149	Unconfirmed	C*12:159	Confirmed		
C*12:150	Unconfirmed	C*12:160	Unconfirmed		
C*12:151	Unconfirmed	C*12:161	Unconfirmed		
C*12:152	Unconfirmed	C*12:162	Unconfirmed		
C*12:153	Unconfirmed	C*12:163	Unconfirmed		
C*12:154	Unconfirmed	C*12:164	Unconfirmed		
C*12:155Q	Unconfirmed	C*12:165	Unconfirmed		
C*12:156	Unconfirmed	C*12:166	Unconfirmed		

¹ Allele status “confirmed” or “unconfirmed” as listed on the IMGT/HLA web page 2015-October-10, release 3.22.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

Results file with resolution in HLA-C*12 homo- and heterozygotes is available upon request.

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Lot-specific information
SPECIFICITY TABLE

HLA-C*12 SSP subtyping

Specificities and sizes of the PCR products of the 44+1 primer mixes used
for HLA-C*12 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-C*12 alleles ³	Other amplified HLA Class I alleles ⁴
1⁶	235 bp	800 bp	*12:02:01-12:03:12, 12:03:13 ^w , 12:03:14- 12:04:02, 12:06-12:08, 12:10:01-12:15, 12:17- 12:20, 12:22-12:32, 12:34-12:48, 12:50-12:54, 12:56-12:97, 12:99- 12:146, 12:148N-12:167	*02:12, 02:49, 02:55:01-02:55:02, 03:15, 03:27, 03:38:01-03:38:02, 03:53, 03:69, 03:130, 03:136, 03:163, 03:246, 03:274, 03:297, 04:03:01, 04:06, 04:16, 04:80, 04:103, 04:107, 04:147, 04:160, 04:171, 04:190, 05:42, 05:46, 06:03:01-06:03:02, 06:76:01- 06:76:02, 06:132:01-06:132:02, 07:26, 07:92, 07:96:01-07:96:02, 07:314:01- 07:314:02, 07:317, 07:351, 08:05, 08:21, 08:25, 15:03, 15:16, 15:25, 16:15:01-16:15:02, 16:25, 16:64, 17:01:01:01-17:19, 17:21-17:26, 17:27N ^w , 17:28-17:30, 18:09, B*07:13, B*07:15, B*07:160, B*67:02
2⁵	100 bp	1070 bp	*12:02:01-12:02:05, 12:02:07, 12:02:09- 12:02:11, 12:02:13, 12:03:19, 12:03:32, 12:08, 12:10:01-12:10:02, 12:14:02, 12:16-12:18:01, 12:22, 12:27, 12:30, 12:36, 12:40-12:41, 12:44, 12:49, 12:56, 12:64, 12:67-12:69, 12:72-12:74, 12:80N, 12:83-12:86, 12:96, 12:103-12:106, 12:112, 12:114, 12:117, 12:123- 12:124, 12:126-12:128, 12:130, 12:132, 12:134, 12:136-12:137, 12:142, 12:145-12:146, 12:148N, 12:151, 12:155Q, 12:161- 12:162, 12:164, 12:166	*01:04, 01:21, 16:02:13
3	220 bp	800 bp	*12:03:01:01-12:07, 12:11-12:13, 12:15, 12:23, 12:25-12:26, 12:28-12:29, 12:31-12:35, 12:37-12:39N, 12:42Q- 12:43, 12:45-12:48, 12:50-12:55, 12:57-12:63, 12:65-12:66, 12:70-12:71, 12:75-12:79, 12:81-12:82, 12:87-12:95, 12:97-	*01:04, 01:09, 02:05:01-02:05:03, 02:17, 06:02:01:01-06:02:01:03, 06:02:03-06:02:15, 06:02:17-06:02:42, 06:02:44-06:03:02, 06:07-06:13, 06:15-06:34:02, 06:36-06:39, 06:41- 06:71, 06:73-06:78, 06:80, 06:82- 06:100, 06:102-06:117, 06:119- 06:122, 06:124-06:126, 06:128N- 06:135, 06:137-06:142, 06:145- 06:152N, 06:154-06:166, 14:16,

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			Lot-specific information	
			12:102, 12:107-12:111, 12:113, 12:115-12:116, 12:119-12:122, 12:125, 12:129, 12:131, 12:133, 12:135, 12:138-12:141, 12:143-12:144, 12:147, 12:149-12:150, 12:152, 12:154, 12:156-12:160, 12:163, 12:165, 12:167	16:04:01, 16:04:03, 16:29, 16:33, 16:42, 16:55, 16:61, 16:66, 16:78, 16:82
4	340 bp	1070 bp	*12:04:01-12:05, 12:09, 12:21, 12:33, 12:41, 12:54, 12:60, 12:146	*01:14, 01:59, 02:02:01-02:02:03, 02:02:05-02:02:11, 02:02:13-02:11, 02:13-02:26:03, 02:28-02:40:02, 02:42-02:86, 02:88-02:108, 03:07, 03:15, 03:45, 03:130, 03:140, 03:163, 03:243, 03:268, 03:297, 04:01:01:01- 04:01:28, 04:01:30-04:01:69, 04:03:01-04:10, 04:12-04:20, 04:23- 04:28, 04:30-04:35, 04:37-04:54, 04:56-04:171, 04:173N-04:213, 04:215N-04:217N, 05:01:01:01- 05:01:31, 05:03-05:124, 06:02:01:01- 06:02:01:03, 06:02:03-06:02:11, 06:02:13-06:10, 06:12-06:51, 06:53:01-06:121, 06:123, 06:125- 06:146, 06:148-06:166, 07:07, 07:09, 07:49, 07:76:01-07:76:02, 07:210, 07:238, 07:247, 07:315, 07:328, 07:403, 07:406, 08:10, 14:04, 14:12, 14:49, 14:64, 15:02:01:01-15:05:10, 15:06:01-15:06:03, 15:08-15:13, 15:15-15:19, 15:22-15:24, 15:26- 15:42, 15:44-15:70, 15:72-15:115N, 15:117, 16:02:01-16:02:13, 16:09, 16:12, 16:19, 16:25, 16:46-16:48, 16:57, 16:60, 16:63, 16:69-16:70, 16:74, 16:77N, 16:84, 17:01:01:01- 17:21, 17:23-17:30, 18:01-18:09
5⁶	130 bp	1070 bp	*12:05, 12:09, 12:21, 12:33, 12:49, 12:98	*01:02:34, 02:02:01-02:02:03, 02:02:05-02:02:07, 02:02:09-02:02:12, 02:02:14-02:02:20, 02:02:21 ^w , 02:02:22-02:02:28, 02:02:30-02:11, 02:13-02:40:02, 02:42-02:48, 02:50- 02:54, 02:56-02:62, 02:64-02:89, 02:91-02:108, 03:04:25, 04:10-04:11, 04:36, 04:55, 04:153, 04:169, 04:210, 04:214-04:215N, 05:01:01:01- 05:01:11, 05:01:13-05:01:23, 05:01:24 ^w , 05:01:25-05:01:31, 05:03- 05:29:01, 05:30-05:41, 05:43-05:45, 05:47-05:108, 05:110-05:124, 06:05, 08:01:01-08:02:02, 08:02:04-08:02:10, 08:02:12-08:04:03, 08:06-08:20, 08:22-08:24, 08:26N-08:63, 08:65- 08:72:02, 08:74-08:94, 08:95 ^w , 08:96- 08:125, 14:02:03, 14:03, 14:08, 14:10, 14:22, 14:35N, 14:38, 14:41, 14:53- 14:54, 14:61, 14:70,

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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				15:02:01-01-15:02:09, 15:02:11-15:02:16, 15:02:18-15:02:24, 15:04:01-15:13, 15:15, 15:17-15:19, 15:21-15:24, 15:26-15:42, 15:44, 15:45 ^w , 15:46-15:66, 15:67 ^w , 15:68-15:82, 15:84Q-15:98, 15:100-15:117, 16:01:01:01, 16:01:03-16:01:15, 16:01:17-16:02:13, 16:04:01, 16:04:03, 16:06-16:14, 16:16Q-16:24, 16:26-16:63, 16:65-16:68, 16:70, 16:71 ^w , 16:72-16:84, 16:86-16:87
6⁵	75 bp 150 bp 415 bp	1070 bp	*12:48, 12:102 *12:06 *12:08, 12:81	*03:08, 03:29, 03:31, 03:246, 04:112, 04:169, 05:36, 06:44, 15:88-15:95N, 15:97-15:103, 15:106, 16:64, 16:70, 16:87
7	140 bp	800 bp	*12:04:02-12:05, 12:09, 12:21, 12:33, 12:41, 12:54, 12:60, 12:146	*02:02:01-02:02:03, 02:02:05-02:02:07, 02:02:09-02:02:11, 02:02:14-02:02:28, 02:02:30-02:11, 02:13-02:26:03, 02:28-02:40:02, 02:42-02:62, 02:64-02:86, 02:88-02:89, 02:91-02:108, 04:01:01:01-04:01:09, 04:01:11-04:01:22, 04:01:24-04:01:28, 04:01:30-04:01:69, 04:03:01-04:10, 04:12-04:20, 04:23-04:28, 04:30-04:35, 04:37-04:54, 04:56-04:129, 04:131-04:171, 04:173N-04:213, 04:215N-04:217N, 05:01:01:01-05:01:11, 05:01:13-05:01:23, 05:01:24 ^w , 05:01:25-05:01:31, 05:03-05:29:01, 05:30-05:124, 06:05, 06:76:02, 08:10, 15:02:01:01-15:02:09, 15:02:11-15:02:16, 15:02:18-15:05:10, 15:06:01-15:06:03, 15:08-15:13, 15:15-15:19, 15:22-15:24, 15:26-15:42, 15:44-15:70, 15:72-15:98, 15:100-15:115N, 15:117, 16:02:01-16:02:13, 16:09, 16:12, 16:19, 16:25, 16:46-16:48, 16:57, 16:60, 16:63, 16:69-16:70, 16:74, 16:77N, 16:84, 17:01:04
8^{5,7}	95 bp 155 bp 195 bp 245 bp	1070 bp	*12:15 *12:40 *12:80N *12:07	*15:02:14 *16:14
9⁵	95 bp	1070 bp	*12:02:01-12:04:02, 12:06-12:08, 12:10:01-12:20, 12:22-12:27, 12:29-12:32, 12:34-12:48, 12:50-12:57, 12:59-12:62, 12:64-12:97, 12:99-12:107, 12:109-12:131, 12:133-12:134, 12:136-12:145, 12:147-12:167	*01:17, 01:21, 02:12, 02:55:01-02:55:02, 03:27, 03:38:01-03:38:02, 03:130, 03:163, 03:246, 04:33, 04:107, 04:172, 05:46, 06:30, 07:07, 07:16, 07:51, 07:181, 07:367, 08:05, 08:21, 08:25, 14:04, 15:03, 15:16, 16:15:01-16:15:02, 16:25, 17:01:01:01-17:10, 17:12-17:14, 17:16-17:25, 17:27N-17:30, B*07:13, B*67:02

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101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.	155 bp	1070 bp	Lot-specific information
10	155 bp	1070 bp	*12:03:01:01-12:03:01:03, 12:03:03-12:03:07, 12:03:09-12:03:15, 12:03:17-12:03:18, 12:03:21-12:03:29, 12:03:31, 12:03:33, 12:03:35-12:03:37, 12:04:02-12:07, 12:11- 12:13, 12:15, 12:20, 12:23-12:25, 12:28-12:29, 12:31-12:32, 12:34-12:35, 12:37-12:39N, 12:42Q- 12:43, 12:45-12:48, 12:50-12:55, 12:57-12:58, 12:60-12:63, 12:65-12:66, 12:70-12:71, 12:75-12:79, 12:81-12:82, 12:87-12:95, 12:97-12:102, 12:107- 12:111, 12:113, 12:115- 12:116, 12:119-12:122, 12:125, 12:129, 12:131, 12:133, 12:135, 12:138- 12:141, 12:143, 12:147, 12:149-12:150, 12:152- 12:154, 12:156-12:160, 12:163, 12:165, 12:167
11	220 bp	1070 bp	*12:09, 12:24 *01:02:01-01:03, 01:06-01:07:01, 01:08, 01:10-01:20, 01:23-01:34, 01:37N-01:48, 01:51-01:54, 01:56N- 01:78, 01:80-01:114, 03:58, 03:86, 03:94, 03:99, 04:37, 05:16, 05:85, 05:107, 06:05-06:06, 08:12, 14:02:01- 14:05, 14:07N, 14:10-14:14, 14:17- 14:27, 14:29-14:52, 14:55-14:62, 14:64-14:72, 15:102, 16:53, 16:68, B*07:239, B*14:03
12 ⁶	135 bp	1070 bp	*12:02:01-12:03:03, 12:03:05-12:03:23, 12:03:24 ^w , 12:03:25- 12:03:33, 12:03:35- 12:03:37, 12:06-12:08, 12:10:01-12:20, 12:22- 12:26, 12:28-12:32, 12:34-12:40, 12:42Q- 12:53, 12:55-12:59, 12:61-12:71, 12:72 ^w , 12:73-12:122, 12:124- 12:134, 12:135 ^w , 12:136- 12:145, 12:147-12:153, 12:154 ^w , 12:155Q-12:167
			*01:02:34, 01:21, 02:12 ^w , 02:27:01- 02:27:02, 02:87, 03:04:25, 04:11, 04:29, 04:36, 04:55, 04:172, 04:214 ^w , 06:11, 06:122 ^w , 06:124 ^w , 06:147, 07:01:13, 07:02:09, 07:04:01-07:04:10, 07:11-07:12, 07:45, 07:63, 07:68, 07:101, 07:139, 07:142, 07:181, 07:199:01-07:199:02, 07:272, 07:302, 07:323-07:324, 07:329N, 07:338, 07:354-07:355, 07:358, 07:364- 07:365, 07:378, 07:394-07:395, 07:420, 07:426, 07:428, 07:447, 07:459, 08:01:01-08:02:10, 08:02:12- 08:09, 08:11-08:63, 08:65-08:94, 08:95 ^w , 08:96-08:125, 14:02:03, 14:03, 14:08, 14:10, 14:22, 14:35N, 14:38, 14:41, 14:53-14:54, 14:61, 14:70, 15:07, 15:21 ^w , 15:25, 15:116 ^w , 16:01:01:01, 16:01:03-16:01:19, 16:04:01, 16:04:03, 16:06-16:08, 16:10-16:11, 16:13-16:18,

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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				16:20-16:24, 16:26-16:36, 16:37 ^w , 16:38-16:45, 16:49-16:56, 16:58- 16:59, 16:61-16:62, 16:64-16:68, 16:71 ^w , 16:72-16:73, 16:75-16:76, 16:78-16:83, 16:86-16:87, B*35:08:02, B*35:08:05, B*67:02
13⁵	105 bp 150 bp	1070 bp	*12:31 *12:10:01-12:10:02, 12:155Q, 12:156	*04:01:05, 08:01:19 *04:01:05, 14:02:08
14⁵	100 bp	1070 bp	*12:16, 12:147	*01:02:34, 01:21, 02:42, 02:107, 04:140, 04:166, 05:98, 06:05 ^w , 07:02:09, 08:14, 08:80, 08:103, 15:63, 15:113, 16:80, B*67:02
	150 bp		*12:11, 12:60, 12:118	
15	140 bp	1070 bp	*12:12	*08:73, B*35:08:02, B*35:08:05
16	185 bp 225 bp	1070 bp	*12:13 *12:14:01-12:14:02	*01:60, 04:58, 04:160, 05:23, 05:62, 06:118, 08:07, 08:47, 08:104, 14:17, 15:65, 17:01:01:01-17:30
17	130 bp 565 bp	1070 bp	*12:159 *12:03:04, 12:03:09	*01:02:18, 06:02:38, 07:447, 14:02:08, B*27:05:27
18	145 bp 165 bp 245 bp 270 bp	1070 bp	*12:17, 12:27 *12:35 *12:17, 12:27 *12:35	*04:12 *03:53
19⁵	100 bp	1070 bp	*12:14:02, 12:18:01, 12:25, 12:83	*03:104, 07:01:20, 07:01:27, 07:02:38, 08:122, B*08:144, B*18:77, B*40:29
20⁵	105 bp 180 bp	1070 bp	*12:46N *12:22, 12:58, 12:94	*04:52, 04:55, 05:55, 14:10, 14:48, 15:12
	235 bp		*12:19, 12:139	
21	250 bp	1070 bp	*12:14:01-12:14:02, 12:18:01-12:18:02, 12:20, 12:83	*01:22, 01:35, 03:262, 05:11, 05:17, 05:27, 05:68, 05:79, 05:115, 06:04:01, 06:118, 06:153, 08:01:01-08:01:19, 08:03:01-08:04:03, 08:06, 08:08:01- 08:11, 08:13-08:14, 08:16:01- 08:16:02, 08:20-08:22, 08:24, 08:26N, 08:36N, 08:38-08:42, 08:44, 08:46, 08:50, 08:54, 08:56-08:61, 08:65- 08:66, 08:72:01-08:72:02, 08:78- 08:89N, 08:91, 08:93, 08:95-08:99, 08:101-08:102, 08:104-08:106, 08:109, 08:113, 08:117, 08:119, 08:121N-08:122, 08:124, 14:06, 14:15, 14:53, 15:02:01:01-15:07, 15:09- 15:13, 15:15-15:19, 15:21-15:24, 15:26-15:50, 15:52-15:73, 15:76- 15:83, 15:85-15:101, 15:103-15:117, 16:35, 16:40, 16:48, 17:01:01:01- 17:16, 17:18-17:30
22⁵	100 bp 590 bp	1070 bp	*12:15, 12:23, 12:99 *12:21	*15:02:14 *08:01:19
23	140 bp	1070 bp	*12:26, 12:63	*16:36

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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24	135 bp 185 bp 425 bp	1070 bp	*12:99 *12:43 *12:28, 12:135	*04:01:05, 06:02:38, 06:76:02, 07:447
25⁵	80 bp 155 bp	1070 bp	*12:39N *12:02:06, 12:02:08, 12:02:12, 12:21, 12:118	*04:01:05, 08:01:19, 08:02:02, B*27:05:27, B*40:02:21
26	355 bp	800 bp	*12:44	*03:38:01-03:38:02, 03:69, 03:130, 03:136, 03:163, 03:246, 03:274, 03:297, 04:80, 04:100, 04:178, 06:14, 06:143, 07:10, 07:43, 07:196, 07:367, 15:03, 15:16, 15:25
27⁵	100 bp 155 bp 185 bp 205 bp 295 bp 570 bp	1070 bp	*12:30 *12:03:19, 12:03:32, 12:155Q *12:94 *12:36 *12:101	*07:214, 07:429 *01:04, 16:02:13 *14:48 *16:81 A*02:466, A*02:504, A*02:596
28⁷	275 bp 350 bp	1070 bp	*12:50 *12:45, 12:166	*01:32, 02:56, 03:102, 03:263, 04:180:01, 06:20, 07:81, 07:168, 07:450, 08:123 *05:81, 06:87, 07:24, 07:218, 14:65, 16:13, 16:61
29⁵	125 bp 185 bp 210 bp	1070 bp	*12:38, 12:104N *12:42Q *12:29, 12:86	B*15:181N, B*57:50 B*46:51Q
30^{5,8}	85 bp 190 bp 230 bp	1070 bp	*12:102, 12:32 *12:143 *12:34	*06:41
31⁵	120 bp 145 bp 190 bp	1070 bp	*12:47 *12:84N, 12:123 *12:42Q, 12:80N	A*11:197, A*26:67, A*68:95 B*46:51Q
32⁵	50 bp 115 bp 180 bp	1070 bp	*12:54 *12:37 *12:62	*01:59, 02:65, 03:130, 03:140, 03:243, 04:114, 05:20, 06:82, 07:49, 07:210, 07:238, 07:247, 07:403, 14:04, 14:64, 15:85, 16:57, A*68:46, B*07:253 *07:204, A*02:211:01, A*02:594, A*24:261, A*68:76:01-68:76:02 A*02:335
33	135 bp	1070 bp	*12:105N	
34	235 bp 260 bp	1070 bp	*12:109 *12:125	*03:171, 03:211:01, 04:144, 05:93, 06:73, 08:20, 08:40
35	195 bp 260 bp	1070 bp	*12:110, 12:143 *12:125	
36	175 bp	1070 bp	*12:62, 12:111	A*02:335
37	225 bp 285 bp	1070 bp	*12:108 *12:73	B*53:34, B*58:21
38⁵	105 bp	1070 bp	*12:15, 12:113	*15:02:14, B*40:02:21
39	225 bp	1070 bp	*12:59, 12:82	*07:102, 07:351, B*07:13, 07:15, B*07:160, B*42:18, B*67:02
40^{5,8}	65 bp	1070 bp	*12:04:01-12:04:02, 12:41, 12:60, 12:72, 12:135, 12:146, 12:154	*02:12, 02:49, 02:55:01-02:55:02, 03:15, 03:163, 03:297, 04:01:01:01- 04:01:47, 04:01:49-04:01:69,

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				04:03:01-04:09N, 04:12-04:20, 04:23-04:28, 04:30-04:35, 04:37- 04:44, 04:46-04:54, 04:56-04:96, 04:98:01-04:113, 04:115N-04:147, 04:149-04:152, 04:154-04:168, 04:170N-04:171, 04:173N-04:209, 04:211-04:213, 04:216-04:217N, 05:42, 05:46, 06:02:01:01-06:02:01:03, 06:02:03-06:02:23, 06:02:25-06:04:01, 06:06-06:10, 06:12-06:43:02, 06:45- 06:64, 06:66-06:81, 06:83-06:123, 06:125-06:137, 06:139-06:146, 06:148-06:166, 07:07, 07:09, 07:76:01-07:76:02, 07:315, 07:406, 14:49, 15:03, 15:16, 16:25, 17:01:01:01-17:14, 17:16-17:21, 17:23-17:30, 18:01-18:09
41	215 bp	1070 bp	*12:90, 12:148N	B*56:08
42⁵	125 bp	1070 bp	*12:122	B*35:12:03, B*44:03:24, B*53:01:06
43	180 bp	1070 bp	*12:28, 12:132, 12:135, 12:146	*02:49, 02:75, 04:01:01:01-04:01:09, 04:01:11-04:01:22, 04:01:24-04:01:69, 04:03:01-04:10, 04:12-04:20, 04:23- 04:26, 04:28-04:32, 04:34-04:51, 04:53-04:54, 04:56-04:106, 04:108- 04:115N, 04:117-04:129, 04:131- 04:168, 04:170N-04:171, 04:173N- 04:217N, 05:25, 05:42, 06:05, 06:76:02, 07:02:09, 08:28, 15:25, 15:62, 16:26, 16:46, 16:55, 16:64
44	290 bp	1070 bp	*12:160	
45⁹	-	-	Negative Control	

¹Alleles 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-C*12 high 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 inherent 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.

²The 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

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band often decreases.

³For 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.

⁴Due to the sharing of sequence motifs between HLA-C alleles, non-HLA-C*12 alleles will be amplified by primer mixes 1 to 28, 30, 32, 34, 38 to 40 and 43.

In addition, a few HLA-A and HLA-B alleles will be amplified by primer mixes 1, 9, 11, 12, 14, 15, 17, 19, 25, 27, 29, 31, 32, 36 to 39, 41 and 42.

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

⁶Primer mixes 1, 5 and 12 may give rise to a lower yield of HLA-specific PCR product than the other C*12 primer mixes.

⁷Primer mixes 8 and 28 have a tendency to giving rise to primer oligomer formation.

⁸Primer mixes 30 and 40 may have tendencies of unspecific amplifications.

⁹Primer mix 45 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.

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PRIMER SPECIFICATION

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec. PCR product	235	100	220	340	130	75	140	95	95	155	220	135
						150		155				
						415		195				
								245				
Length of int. pos. control ¹	800	1070	800	1070	1070	1070	800	1070	1070	1070	1070	1070
5'-primer(s) ²	98	419	361	1st I	201	28	201	98	289	361	361	201
	5'-CTA 3'	5'-gTC 3'	5'-AgT 3'	5'-CgA 3'	5'-CCA 3'	5'-TCA 3'	5'-CCA 3'	5'-CTA 3'	5'-Agg 3'	5'-AgT 3'	5'-AgT 3'	5'-CCA 3'
						431		420				213
						5'-CgT 3'		5'-TTA 3'				5'-CCC 3'
						499						
						5'-TCg 3'						
						504						
						5'-CAT 3'						
3'-primer(s) ³	289	477	538	302	289	270	302	214	341	474	538	302
	5'-AgC 3'	5'-gCA 3'	5'-CCA 3'	5'-ggT 3'	5'-AgT 3'	5'-TAg 3'	5'-ggT 3'	5'-CCA 3'	5'-Cgg 3'	5'-gCA 3'	5'-CCg 3'	5'-ggC 3'
	289				289	538		251				
	5'-AgC 3'				5'-AgT 3'	5'-CCA 3'		5'-CCT 3'				
	295							301				
	5'-TCC 3'							5'-gCC 3'				
								474				
								5'-gCA 3'				
Well No.	1	2	3	4	5	6	7	8	9	10	11	12

Well No.	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec. PCR product	105	100	140	185	130	145	100	105	250	100	140	135
	150	150		225	565	165		180		590		185
						245		235				425
						270						
Length of int. pos. control ¹	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070
5'-primer(s) ²	368	142	201	2nd I	201	98	257	201	2nd I	176	201	98
	5'-gTT 3'	5'-TCT 3'	5'-CCA 3'	5'-CCA 3'	5'-CCg 3'	5'-CTA 3'	5'-CCC 3'	5'-CCA 3'	5'-CCA 3'	5'-gCA 3'	5'-CCA 3'	5'-CTA 3'
	375	364			386	201	477	361		379	368	341
	5'-Tgg 3'	5'-ggT 3'			5'-gCT 3'	5'-CCA 3'	5'-gCT 3'	5'-AgT 3'		5'-ACg 3'	5'-gTA 3'	5'-ggA 3'
	412	368								420		379
	5'-ATA 3'	5'-gTC 3'								5'-TTA 3'		5'-ACg 3'
										3rd I		
										5'-Cgg 3'		
3'-primer(s) ³	474	201	299	473	474	295	311	332	539	474	288	241
	5'-gCA 3'	5'-CTT 3'	5'-TCT 3'	5'-CAA 3'	5'-gCA 3'	5'-TCC 3'	5'-ggT 3'	5'-TCC 3'	5'-TCA 3'	5'-gCA 3'	5'-gCg 3'	5'-CgT 3'
	477	474		512		308	538	343		658	476	474
	5'-gCA 3'	5'-gCA 3'		5'-CCA 3'		5'-TCg 3'	5'-CAg 3'	5'-T 3'		5'-gTg 3'	5'-CgA 3'	5'-gCA 3'
						326		426				
						5'-TgC 3'		5'-TCC 3'				
								506				
								5'-TgT 3'				
								538				
								5'-gCA 3'				
								562				
								5'-gCg 3'				
Well No.	13	14	15	16	17	18	19	20	21	22	23	24

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: **3D5**

Lot-specific information

Well No.	25	26	27	28	29	30	31	32	33	34	35	36
Length of spec. PCR product	80	355	100	275	125	85	120	50	135	235	195	175
			155	350	185	190	145	115		260	260	
			185		210	230	190	180				
			205									
			295									
			570									
Length of int. pos. control ¹	1070	800	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070
5'-primer(s) ²	252 5'-TgA 3'	289 5'-Agg 3'	127 5'-gAC 3'	385 5'-ggT 3'	419 5'-gTC 3'	347 5'-gTg 3'	98 5'-CTA 3'	173 5'-CgA 3'	419 5'-gTC 3'	625 5'-ACg 3'	625 5'-ACg 3'	173 5'-CgA 3'
	361 5'-AgA 3'		228 5'-ATg 3'	463 5'-TgA 3'		490 5'-CgT 3'	419 5'-gTC 3'	302 5'-gAA 3'		652 5'-CCA 3'	694 5'-gCA 3'	710 5'-gAA 3'
	361 5'-AgC 3'		361 5'-AgT 3'			499 5'-TCg 3'		379 5'-ACC 3'			1046 5'-TgT 3'	
			375 5'-Tgg 3'			1046 5'-TgT 3'						
3'-primer(s) ³	289 5'-AgC 3'	353 5'-TgA 3'	289 5'-AgC 3'	3rd I 5'-CTC 3'	502 5'-CTA 3'	538 5'-CCA 3'	175 5'-CCA 3'	312 5'-Agg 3'	514 5'-CTA 3'	846 5'-CAC 3'	846 5'-CAC 3'	312 5'-Agg 3'
	474 5'-gCA 3'		477 5'-gCA 3'		505 5'-gCC 3'	1087 5'-AgC 3'	197 5'-gAT 3'	453 5'-TCT 3'			1087 5'-AgC 3'	846 5'-CAC 3'
			506 5'-TgT 3'		564 5'-ACC 3'		201 5'-CTT 3'					
			613 5'-gCA 3'		587 5'-CCC 3'		251 5'-CCT 3'					
							564 5'-ACC 3'					
Well No.	25	26	27	28	29	30	31	32	33	34	35	36

Well No.	37	38	39	40	41	42	43	44
Length of spec. PCR product	225	105	225	65	215	125	180	290
	285							
Length of int. pos. control ¹	1070	1070	1070	1070	1070	1070	1070	1070
5'-primer(s) ²	98 5'-CTA 3'	409 5'-ggC 3'	103 5'-CCT 3'	289 5'-Agg 3'	98 5'-CTA 3'	474 5'-ACT 3'	201 5'-CCA 3'	832 5'-AAC 3'
			112 5'-CCg 3'					
3'-primer(s) ³	284 5'-gTT 3'	474 5'-gCA 3'	289 5'-AgC 3'	312 5'-AgT 3'	265 5'-CTA 3'	559 5'-CAg 3'	341 5'-CgT 3'	956 5'-CAg 3'
	340 5'-ggT 3'				277 5'-gCC 3'			
Well No.	37	38	39	40	41	42	43	44

¹The 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.

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: 3D5

Lot-specific information

²The 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.

³The 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.

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: **3D5**

Lot-specific information

CELL LINE VALIDATION SHEET																			
HLA-C*12 SSP primer set²																			
			Prod. No.:	Well															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	IHWC cell line ¹	C*		201432001	201432002	201432003	201432004	201446205	201432006	201432007	201432008	201432009	201432010	201432011	201432012	201561013	201432014	201432015	201432016
1	9001 SA	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*07:01	*15:05	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*12:02		+	+	-	-	-	-	-	-	+	-	-	+	-	-	-	-
4	9275 GU373	*03:04	*04:01	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*06:02		-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM	*03:04	*07:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020 QBL	*05:01		-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
8	9025 DEU	*04:01		-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
9	9026 YAR	*12:03		+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-
10	9107 LKT3	*01:02		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
11	9051 PITOUT	*16:01		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
12	9052 DBB	*06:02		-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*01:02		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
14	9071 OLGA	*01:02	*03:04	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
15	9075 DKB	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*02:02		-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
17	9282 CTM3953540	*03:03	*07:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257 32367	*01:02	*07:05	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
19	9038 BM16	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056 KOSE	*12:03		+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-
23	9124 IHL	*01:02	*15:02	-	-	-	+	+	-	+	-	-	-	+	-	-	-	-	-
24	9035 JBUSH	*12:03		+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-
25	9049 IBW9	*08:02		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
26	9285 WT49	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191 CH1007	*07:04	*15:05	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-
28	9320 BEL5GB	*05:01	*16:01	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-
29	9050 MOU	*16:01		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
30	9021 RSH	*17:01		+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	+
31	9019 DUCAF	*05:01		-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
32	9297 HAG	*17:01	*17:03	+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	+
33	9098 MT14B	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*12:03		+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-
35	9302 SSTO	*05:01		-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
36	9024 KT17	*03:03	*04:01	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
37	9065 HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315 CML	*02:02	*07:01	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
40	9134 WHONP199	*01:02	*06:02	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-
41	9055 H0301	*08:02		-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
42	9066 TAB089	*01:02		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
43	9076 T7526	*01:02	*08:01	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-
44	9057 TEM	*12:03		+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-
45	9239 SHJO	*06:02	*17:01	+	-	+	+	-	-	-	-	+	-	-	-	-	-	-	+
46	9013 SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO	*07:04	*15:02	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-
48	9303 TER-ND	*04:01	*16:01	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-

101.624-12 – including Taq polymerase, IFU-01
101.624-12u – without Taq polymerase, IFU-02

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Lot No.: **3D5**

Lot-specific information

CELL LINE VALIDATION SHEET																				
HLA-C*12 SSP primer set²																				
				Well																
				17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
				Prod. No.:	201561017	201432018	201432019	201561020	201432021	201561022	201432023	201561024	201561025	201432026	201561027	201432028	201432029	201561030	201561031	201561032
		IHW cell line¹	C*																	
1	9001	SA	*07:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	9280	LK707	*07:01	*15:05	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
3	9011	E4181324	*12:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	9275	GU373	*03:04	*04:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	9009	KAS011	*06:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	9353	SM	*03:04	*07:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	9020	QBL	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	9025	DEU	*04:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	9026	YAR	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	9107	LKT3	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	9051	PITOUT	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	9052	DBB	*06:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	9004	JESTHOM	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	9071	OLGA	*01:02	*03:04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15	9075	DKB	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	9037	SWEIG007	*02:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
17	9282	CTM3953540	*03:03	*07:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18	9257	32367	*01:02	*07:05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19	9038	BM16	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20	9059	SLE005	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	9064	AMALA	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22	9056	KOSE	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
23	9124	IHL	*01:02	*15:02	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
24	9035	JBUSH	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25	9049	IBW9	*08:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26	9285	WT49	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27	9191	CH1007	*07:04	*15:05	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
28	9320	BEL5GB	*05:01	*16:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29	9050	MOU	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	9021	RSH	*17:01		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
31	9019	DUCAF	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
32	9297	HAG	*17:01	*17:03	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
33	9098	MT14B	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34	9104	DHIF	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
35	9302	SSTO	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36	9024	KT17	*03:03	*04:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
38	9099	LZL	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
39	9315	CML	*02:02	*07:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	9134	WHONP199	*01:02	*06:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
41	9055	H0301	*08:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
42	9066	TAB089	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
43	9076	T7526	*01:02	*08:01	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
44	9057	TEM	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
45	9239	SHJO	*06:02	*17:01	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
47	9045	TUBO	*07:04	*15:02	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	
48	9303	TER-ND	*04:01	*16:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: **3D5**

Lot-specific information

CELL LINE VALIDATION SHEET																	
HLA-C*12 SSP primer set²																	
					Well												
					33	34	35	36	37	38	39	40	41	42	43	44	
					Prod. No.:	201432033	201561034	201561035	201561036	201561037	201561038	201561039	201561040	201561041	201561042	201561043	201561044
IHWC cell line¹			C*														
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*07:01	*15:05	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011	E4181324	*12:02		-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*03:04	*04:01	-	-	-	-	-	-	-	-	+	-	-	+	-
5	9009	KAS011	*06:02		-	-	-	-	-	-	-	-	+	-	-	-	-
6	9353	SM	*03:04	*07:02	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020	QBL	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*04:01		-	-	-	-	-	-	-	-	+	-	-	+	-
9	9026	YAR	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052	DBB	*06:02		-	-	-	-	-	-	-	-	+	-	-	-	-
13	9004	JESTHOM	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*01:02	*03:04	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*02:02		-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*03:03	*07:01	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257	32367	*01:02	*07:05	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*01:02	*15:02	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*08:02		-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*07:01		-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:04	*15:05	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320	BEL5GB	*05:01	*16:01	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050	MOU	*16:01		-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021	RSH	*17:01		-	-	-	-	-	-	-	-	+	-	-	-	-
31	9019	DUCAF	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*17:01	*17:03	-	-	-	-	-	-	-	-	+	-	-	-	-
33	9098	MT14B	*03:04		-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*05:01		-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024	KT17	*03:03	*04:01	-	-	-	-	-	-	-	-	+	-	-	+	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*03:03		-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*02:02	*07:01	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134	WHONP199	*01:02	*06:02	-	-	-	-	-	-	-	-	+	-	-	-	-
41	9055	H0301	*08:02		-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*01:02		-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*01:02	*08:01	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*12:03		-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*06:02	*17:01	-	-	-	-	-	-	-	-	+	-	-	-	-
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*07:04	*15:02	-	-	-	-	-	-	-	-	-	-	-	-	-
48	9303	TER-ND	*04:01	*16:01	-	-	-	-	-	-	-	-	+	-	-	+	-

¹The 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.

²The specificity of each primer solution in the kit has been tested against 48 well characterized cell line



101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: 3D5

Lot-specific information

DNAs and where applicable, additional cell line DNAs.

No DNAs carrying the alleles to be amplified by primer solutions 6, 8, 13 to 15, 17 to 20, 22 to 39, 41, 42 and 44 were available. The specificities of the primers in primer solutions 6, 8, 13 to 15, 17, 19, 20, 22, 24 to 28, 32, 38, 39 and 42 were tested by separately adding additional 5'-primers, respectively additional 3'-primers. In primer solutions 18, 23, 29, 31, 33, 37 and 41 it was only possible to test the 5'-primer, the 3'-primer was not possible to test. In primer solutions 30, 34 to 36 and 44 it was only possible to test the 3'-primer, the 5'-primers were not possible to test. In primer solutions 6, 13, 14, 17, 19, 25, 27, 28, 32 and 39 one, two or three 5'-primers were not possible to test, and in primer solutions 1, 8, 16, 20, 22, 24 and 27 one, two or three 3'-primers were not possible to test.

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot-specific information

101.624-12 – including *Taq* polymerase, IFU-01
101.624-12u – without *Taq* polymerase, IFU-02

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Lot No.: **3D5**

Lot-specific information

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