

Olerup SSP[®] HLA-B*39

Product number:	101.566-12u/04u – without <i>Taq</i> pol.
Lot number:	47K
Expiry date:	2013-April-01
Number of tests:	12 tests – Product No. 101.566-12u 4 tests – Product No. 101.566-04u
Number of wells per test:	32
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. 47K.

**CHANGES COMPARED TO THE PREVIOUS OLERUP SSP[®]
HLA-B*39 LOT**

The HLA-B*39 specificity and interpretation tables have been updated for the HLA-B alleles described since the previous *Olerup SSP[®]* HLA-B*39 lot was made (**Lot No. 67G**).

The amplification patterns for some rare HLA-B*39 alleles only differ by the length of the specific PCR products.

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

Well	5'-primer	3'-primer	rationale
4	-	Added	Primer pair added for the B*39:58 allele.
8	Modified	Modified	Modified primers for improved specificity and yield of specific PCR product.
9	Added	Added	Exchanged positive control primer pair, primer pair added for the B*39:59 allele.
13	-	Modified	3'-primer modified for decreased primer oligomer formation.
20	-	Added	Increased yield of specific PCR product.
22	-	-	Exchanged positive control primer pair.
24	-	Modified	3'-primer modified for increased specificity.
25	Added	Added	Primer pair added for the B*39:60 allele.
28	-	Added	Primer added for the B*39:56 allele.

Change in revision R01 compared to R00:

1. The B*39:31 allele is weakly amplified by primer mix 24.

PRODUCT DESCRIPTION

HLA-B*39 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the B*39:01 to B*39:60 alleles.

PLATE LAYOUT

Each test consists of 32 PCR reactions in a 32 well cut 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

The 32 well cut PCR plate is marked with 'HLA-B*39' in silver/gray ink.

Well No. 1 is marked with the Lot Number '47K'.

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.

Please note: When removing each 32 well PCR plate, make sure that the remaining plates stay covered. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

The interpretation of HLA-B*39 SSP subtypings will be influenced by the B*07, the B*08, the B*13, the B*14, most B*15, the B*18, the B*27, B*35, the B*37, the B*38, many B*40, six B*41, the B*42, many B*44, three B*45, seven B*46, the B*47, the B*48, the B*49:07, several B*51, five B*52, most B*53, the B*54, the B*55, most B*56, several B*57, most B*58, the B*59, the B*67, the B*73, three B*78, the B*81, the B*82 and the B*83:01 alleles when present on the other haplotype. In addition, the C*01:30 allele will be amplified by primer mix 26, the C*06:40 allele will be amplified by primer mixes 1 and 30, the C*07:138 allele will be amplified by primer mixes 1, 16, 20 and 21, the C*15:15 allele will be amplified by primer mix 28, and the C*15:31 allele will be amplified by primer mix 25.

UNIQUELY IDENTIFIED ALLELES

All the HLA-B*39 alleles, i.e. **B*39:01 to B*39:60**, recognized by the HLA Nomenclature Committee in July 2010¹ will give rise to unique amplification patterns by the primers in the HLA-B*39 subtyping kit².

The HLA-B*39 subtyping kit cannot distinguish the B*39:01:01:01, 39:01:03, 39:01:06-39:01:08 and 39:01:10-39:01:11 alleles, the B*39:05:01-39:05:02 alleles, the B* 39:06:01-39:06:02 alleles or the B* 39:13:01-39:13:02 alleles.

The B*39:01:01:02L and B*39:60 alleles can be distinguished by the different sizes of the specific PCR products generated by primer mix 25.

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Lot-specific information

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¹HLA-B alleles listed on the IMGT/HLA web page 2010-July-16, release 3.1.0, www.ebi.ac.uk/imgt/hla.

²The B*39:10 and B*67:01:02 alleles will give rise to identical amplification patterns with the HLA-B*39 subtyping kit. These two alleles can be distinguished by the HLA-B low resolution and/or HLA-B*67 kits.

RESOLUTION IN HOMO- AND HETEROZYGOTES

A total of 74 alleles generate 63 amplification patterns that can be combined in 2016 homozygous and heterozygous combinations. 1180 of these genotypes do not give rise to unique amplification patterns. The different lengths of the specific PCR products were not considered in these calculations.

+++++--	-----	--+++++	-----	*39:26, *39:37 = *39:37, *39:58
+++++--	-+-----	--+++++	-----	*39:07, *39:26 = *39:07, *39:58
+++++--	-----	--+++++	-----	*39:11, *39:26 = *39:11, *39:58
+++++--	-----	--+++++	-----	*39:26, *39:55 = *39:55, *39:58
+++++--	-----	--+++++	-----	*39:26, *39:56 = *39:56, *39:58
+++++--	-----	--+++++	-----	*39:26, *39:43 = *39:43, *39:58
+++++--	-----	--+++++	-----	*39:05:01, *39:26 = *39:05:01, *39:58
+++++--	-----	--+++++	-----	*39:13:01, *39:29 = *39:14, *39:49 = *39:29, *39:49
+++++--	-----	--+++++	-----	*39:02:01, *39:37 = *39:03, *39:13:01
+++++--	-----	--+++++	-----	*39:02:02, *39:37 = *39:13:01, *39:37
+++++--	-----	--+++++	-----	*39:04, *39:08 = *39:08, *39:46 = *39:08, *39:47
+++++--	-----	--+++++	-----	*39:46, *39:49 = *39:47, *39:49
+++++--	-----	--+++++	-----	*39:13:01, *39:46 = *39:13:01, *39:47
+++++--	-----	--+++++	-----	*39:06:01, *39:08 = *39:08, *39:57 = *39:13:01, *39:57
+++++--	-----	--+++++	-----	*39:02:01, *39:07 = *39:19:02, *39:49
+++++--	-----	--+++++	-----	*39:02:02, *39:07 = *39:07, *39:13:01 = *39:07, *39:49
+++++--	-----	--+++++	-----	*39:33, *39:49 = *39:40N, *39:49
+++++--	-----	--+++++	-----	*39:08, *39:15 = *39:36, *39:49 = *39:49, *39:53
+++++--	-----	--+++++	-----	*39:08, *39:55 = *39:11, *39:49
+++++--	-----	--+++++	-----	*39:08, *39:12 = *39:08, *39:31
+++++--	-----	--+++++	-----	*39:08, *39:18 = *39:13:01, *39:18
+++++--	-----	--+++++	-----	*39:08, *39:28 = *39:08, *39:45
+++++--	-----	--+++++	-----	*39:08, *39:33 = *39:08, *39:40N = *39:13:01, *39:33 = *39:13:01, *39:40N
+++++--	-----	--+++++	-----	*39:08, *39:30 = *39:08, *39:43
+++++--	-----	--+++++	-----	*39:08, *39:41 = *39:08, *39:42
+++++--	-----	--+++++	-----	*39:02:01, *39:11 = *39:08, *39:36 = *39:08, *39:53 = *39:13:01, *39:36 = *39:13:01, *39:53
+++++--	-----	--+++++	-----	*39:01:04, *39:08 = *39:01:09, *39:08 = *39:02:02, *39:11 = *39:05:01, *39:08 = *39:08, *39:11 = *39:11, *39:13:01
+++++--	-----	--+++++	-----	*39:30, *39:49 = *39:43, *39:49
+++++--	-----	--+++++	-----	*39:41, *39:49 = *39:42, *39:49
+++++--	-----	--+++++	-----	*39:02:01, *39:55 = *39:13:01, *39:15 = *39:15, *39:49
+++++--	-----	--+++++	-----	*39:01:04, *39:49 = *39:02:02, *39:55 = *39:05:01, *39:49 = *39:13:01, *39:55 = *39:49, *39:55
+++++--	-----	--+++++	-----	*39:02:01, *39:43 = *39:02:02, *39:43 = *39:13:01, *39:30 = *39:13:01, *39:43
+++++--	-----	--+++++	-----	*39:13:01, *39:41 = *39:13:01, *39:42
+++++--	-----	--+++++	-----	*39:02:02, *39:56 = *39:13:01, *39:56
+++++--	-----	--+++++	-----	*39:01:04, *39:13:01 = *39:02:02, *39:05:01 = *39:05:01, *39:13:01
+++++--	-----	--+++++	-----	*39:04, *39:37 = *39:37, *39:46
+++++--	-----	--+++++	-----	*39:07, *39:14 = *39:07, *39:29
+++++--	-----	--+++++	-----	*39:03, *39:11 = *39:37, *39:53
+++++--	-----	--+++++	-----	*39:05:01, *39:29 = *39:14, *39:55 = *39:29, *39:55
+++++--	-----	--+++++	-----	*39:03, *39:55 = *39:15, *39:37
+++++--	-----	--+++++	-----	*39:05:01, *39:17 = *39:10, *39:37 = *39:17, *39:37 = *39:20, *39:37
+++++--	-----	--+++++	-----	*39:12, *39:37 = *39:31, *39:37 = *39:37, *39:54
+++++--	-----	--+++++	-----	*39:35, *39:37 = *39:37, *39:52
+++++--	-----	--+++++	-----	*39:05:01, *39:24 = *39:37, *39:41 = *39:37, *39:42
+++++--	-----	--+++++	-----	*39:01:04, *39:37 = *39:01:09, *39:37 = *39:05:01, *39:37
+++++--	-----	--+++++	-----	*39:03, *39:43 = *39:30, *39:37 = *39:37, *39:43
+++++--	-----	--+++++	-----	*39:04, *39:07 = *39:07, *39:46 = *39:07, *39:47
+++++--	-----	--+++++	-----	*39:04, *39:11 = *39:11, *39:46 = *39:11, *39:47
+++++--	-----	--+++++	-----	*39:04, *39:55 = *39:46, *39:55 = *39:47, *39:55
+++++--	-----	--+++++	-----	*39:20, *39:46 = *39:20, *39:47
+++++--	-----	--+++++	-----	*39:04, *39:56 = *39:46, *39:56 = *39:47, *39:56
+++++--	-----	--+++++	-----	*39:04, *39:43 = *39:43, *39:46

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Lot-specific information

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+++++---- -+----- --+----- +----- *39:04, *39:05:01 = *39:05:01, *39:46 = *39:05:01, *39:47
+++++---- +----- --+----- +----- *39:05:01, *39:57 = *39:06:01, *39:11 = *39:11, *39:57
+++++---- -+----- --+----- +----- *39:07, *39:33 = *39:07, *39:40N
+++++---- -+----- --+----- +----- *39:07, *39:36 = *39:07, *39:53
+++++---- -+----- --+----- +----- *39:07, *39:10 = *39:07, *39:20
+++++---- -+----- --+----- +----- *39:07, *39:12 = *39:07, *39:31 = *39:07, *39:54
+++++---- -+----- --+----- +----- *39:07, *39:28 = *39:07, *39:45
+++++---- -+----- --+----- +----- *39:07, *39:35 = *39:07, *39:52
+++++---- -+----- --+----- +----- *39:07, *39:30 = *39:07, *39:43
+++++---- -+----- --+----- +----- *39:07, *39:41 = *39:07, *39:42
+++++---- -+----- --+----- +----- *39:07, *39:15 = *39:07, *39:19:02 = *39:19:02, *39:55
+++++---- -+----- --+----- +----- *39:01:04, *39:07 = *39:01:09, *39:07 = *39:05:01, *39:07 = *39:07, *39:07 =
*39:07, *39:19:01 = *39:07, *39:55 = *39:19:01, *39:55
+++++---- -+----- --+----- +----- *39:19:01, *39:43 = *39:19:02, *39:43
+++++---- -+----- --+----- +----- *39:33, *39:55 = *39:40N, *39:55
+++++---- -+----- --+----- +----- *39:11, *39:15 = *39:36, *39:55 = *39:53, *39:55
+++++---- -+----- --+----- +----- *39:20, *39:33 = *39:20, *39:40N
+++++---- -+----- --+----- +----- *39:20, *39:36 = *39:20, *39:53
+++++---- -+----- --+----- +----- *39:10, *39:11 = *39:11, *39:20
+++++---- -+----- --+----- +----- *39:11, *39:12 = *39:11, *39:31 = *39:11, *39:54
+++++---- -+----- --+----- +----- *39:05:01, *39:18 = *39:11, *39:18
+++++---- -+----- --+----- +----- *39:11, *39:28 = *39:11, *39:45
+++++---- -+----- --+----- +----- *39:05:01, *39:33 = *39:05:01, *39:40N = *39:11, *39:33 = *39:11, *39:40N =
*39:33, *39:56 = *39:36, *39:56 = *39:40N, *39:56 = *39:53, *39:56
+++++---- -+----- --+----- +----- *39:11, *39:35 = *39:11, *39:52
+++++---- -+----- --+----- +----- *39:11, *39:30 = *39:11, *39:43 = *39:43, *39:53
+++++---- -+----- --+----- +----- *39:11, *39:41 = *39:11, *39:42
+++++---- -+----- --+----- +----- *39:05:01, *39:36 = *39:05:01, *39:53 = *39:11, *39:36 = *39:11, *39:53
+++++---- -+----- --+----- +----- *39:01:04, *39:11 = *39:01:09, *39:11 = *39:05:01, *39:11 = *39:11, *39:11
+++++---- -+----- --+----- +----- *39:10, *39:55 = *39:20, *39:55
+++++---- -+----- --+----- +----- *39:12, *39:55 = *39:31, *39:55 = *39:54, *39:55
+++++---- -+----- --+----- +----- *39:28, *39:55 = *39:45, *39:55
+++++---- -+----- --+----- +----- *39:35, *39:55 = *39:52, *39:55
+++++---- -+----- --+----- +----- *39:15, *39:43 = *39:30, *39:55 = *39:43, *39:55
+++++---- -+----- --+----- +----- *39:41, *39:55 = *39:42, *39:55
+++++---- -+----- --+----- +----- *39:05:01, *39:15 = *39:15, *39:55
+++++---- -+----- --+----- +----- *39:01:04, *39:55 = *39:01:09, *39:55 = *39:05:01, *39:55 = *39:55, *39:55
+++++---- -+----- --+----- +----- *39:10, *39:43 = *39:20, *39:30 = *39:20, *39:43
+++++---- -+----- --+----- +----- *39:20, *39:41 = *39:20, *39:42
+++++---- -+----- --+----- +----- *39:10, *39:56 = *39:20, *39:56
+++++---- -+----- --+----- +----- *39:01:04, *39:20 = *39:05:01, *39:10 = *39:05:01, *39:20
+++++---- -+----- --+----- +----- *39:12, *39:56 = *39:31, *39:56 = *39:54, *39:56
+++++---- -+----- --+----- +----- *39:12, *39:43 = *39:31, *39:43 = *39:43, *39:54
+++++---- -+----- --+----- +----- *39:05:01, *39:12 = *39:05:01, *39:31 = *39:05:01, *39:54
+++++---- -+----- --+----- +----- *39:28, *39:56 = *39:45, *39:56
+++++---- -+----- --+----- +----- *39:05:01, *39:28 = *39:05:01, *39:45
+++++---- -+----- --+----- +----- *39:05:01, *39:32 = *39:32, *39:56 = *39:48, *39:56
+++++---- -+----- --+----- +----- *39:35, *39:56 = *39:52, *39:56
+++++---- -+----- --+----- +----- *39:30, *39:56 = *39:43, *39:56
+++++---- -+----- --+----- +----- *39:41, *39:56 = *39:42, *39:56
+++++---- -+----- --+----- +----- *39:35, *39:43 = *39:43, *39:52
+++++---- -+----- --+----- +----- *39:05:01, *39:35 = *39:05:01, *39:52
+++++---- -+----- --+----- +----- *39:01:04, *39:43 = *39:01:09, *39:43 = *39:05:01, *39:30 = *39:05:01, *39:43
+++++---- -+----- --+----- +----- *39:05:01, *39:41 = *39:05:01, *39:42
+++++---- -+----- --+----- +----- *39:01:04, *39:56 = *39:01:09, *39:56 = *39:05:01, *39:56 = *39:56, *39:56
+++++---- -+----- --+----- +----- *39:01:04, *39:05:01 = *39:01:09, *39:05:01 = *39:05:01, *39:05:01
+++++---- -+----- --+----- +----- *39:02:01, *39:51 = *39:02:02, *39:51 = *39:23, *39:26 = *39:23, *39:51
+++++---- -+----- --+----- +----- *39:02:01, *39:26 = *39:02:02, *39:26
+++++---- -+----- --+----- +----- *39:26, *39:29 = *39:29, *39:58
+++++---- -+----- --+----- +----- *39:14, *39:26 = *39:14, *39:58
+++++---- -+----- --+----- +----- *39:24, *39:26 = *39:24, *39:58
+++++---- -+----- --+----- +----- *39:03, *39:26 = *39:03, *39:58
+++++---- -+----- --+----- +----- *39:04, *39:51 = *39:46, *39:51 = *39:47, *39:51
+++++---- -+----- --+----- +----- *39:26, *39:50 = *39:50, *39:58
+++++---- -+----- --+----- +----- *39:04, *39:26 = *39:04, *39:58 = *39:26, *39:46 = *39:26, *39:47 = *39:46, *39:58 =
*39:47, *39:58
+++++---- -+----- --+----- +----- *39:26, *39:57 = *39:57, *39:58
+++++---- -+----- --+----- +----- *39:06:01, *39:26 = *39:06:01, *39:58
+++++---- -+----- --+----- +----- *39:26, *39:59 = *39:58, *39:59
+++++---- -+----- --+----- +----- *39:19:01, *39:51 = *39:19:02, *39:51
+++++---- -+----- --+----- +----- *39:19:01, *39:26 = *39:19:01, *39:58 = *39:19:02, *39:26 = *39:19:02, *39:58
+++++---- -+----- --+----- +----- *39:33, *39:51 = *39:40N, *39:51
+++++---- -+----- --+----- +----- *39:36, *39:51 = *39:51, *39:53

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+++++---	-----	-----	-----	*39:18, *39:26 = *39:18, *39:58
+++++---	-----	-----	-----	*39:26, *39:33 = *39:26, *39:40N = *39:33, *39:58 = *39:40N, *39:58
+++++---	-----	-----	-----	*39:26, *39:36 = *39:26, *39:53 = *39:36, *39:58 = *39:53, *39:58
+++++---	-----	-----	-----	*39:15, *39:26 = *39:15, *39:58
+++++---	-----	-----	-----	*39:12, *39:51 = *39:31, *39:51 = *39:51, *39:54
+++++---	-----	-----	-----	*39:01:05, *39:51 = *39:26, *39:27 = *39:27, *39:51 = *39:27, *39:58
+++++---	-----	-----	-----	*39:28, *39:51 = *39:45, *39:51
+++++---	-----	-----	-----	*39:35, *39:51 = *39:51, *39:52
+++++---	-----	-----	-----	*39:41, *39:51 = *39:42, *39:51
+++++---	-----	-----	-----	*39:01:04, *39:51 = *39:01:09, *39:51 = *39:26, *39:44 = *39:26, *39:51 = *39:44, *39:51 = *39:44, *39:58 = *39:51, *39:51 = *39:51, *39:58
+++++---	-----	-----	-----	*39:26, *39:38Q = *39:38Q, *39:58
+++++---	-----	-----	-----	*39:12, *39:26 = *39:12, *39:58 = *39:26, *39:31 = *39:26, *39:54 = *39:31, *39:58
+++++---	-----	-----	-----	*39:09, *39:26 = *39:09, *39:58
+++++---	-----	-----	-----	*39:25N, *39:26 = *39:25N, *39:58
+++++---	-----	-----	-----	*39:22, *39:26 = *39:22, *39:58
+++++---	-----	-----	-----	*39:01:05, *39:26 = *39:01:05, *39:58
+++++---	-----	-----	-----	*39:26, *39:28 = *39:26, *39:45 = *39:28, *39:58 = *39:45, *39:58
+++++---	-----	-----	-----	*39:01:01:02L, *39:26 = *39:01:01:02L, *39:58
+++++---	-----	-----	-----	*39:26, *39:32 = *39:32, *39:58
+++++---	-----	-----	-----	*39:26, *39:48 = *39:48, *39:58
+++++---	-----	-----	-----	*39:26, *39:34 = *39:34, *39:58
+++++---	-----	-----	-----	*39:26, *39:35 = *39:26, *39:52 = *39:35, *39:58
+++++---	-----	-----	-----	*39:26, *39:30 = *39:30, *39:58
+++++---	-----	-----	-----	*39:26, *39:41 = *39:26, *39:42 = *39:41, *39:58 = *39:42, *39:58
+++++---	-----	-----	-----	*39:01:04, *39:26 = *39:01:04, *39:58 = *39:01:09, *39:26 = *39:01:09, *39:58 = *39:26, *39:26 = *39:26, *39:58
+++++---	-----	-----	-----	*39:02:01, *39:29 = *39:02:02, *39:29
+++++---	-----	-----	-----	*39:02:01, *39:14 = *39:02:02, *39:14
+++++---	-----	-----	-----	*39:02:01, *39:24 = *39:02:02, *39:24
+++++---	-----	-----	-----	*39:02:01, *39:03 = *39:02:02, *39:03
+++++---	-----	-----	-----	*39:23, *39:46 = *39:23, *39:47
+++++---	-----	-----	-----	*39:02:01, *39:50 = *39:02:02, *39:50
+++++---	-----	-----	-----	*39:02:01, *39:04 = *39:02:01, *39:46 = *39:02:01, *39:47 = *39:02:02, *39:46 = *39:02:02, *39:47
+++++---	-----	-----	-----	*39:04, *39:39 = *39:39, *39:46 = *39:39, *39:47
+++++---	-----	-----	-----	*39:02:01, *39:57 = *39:02:02, *39:57
+++++---	-----	-----	-----	*39:02:01, *39:06:01 = *39:02:02, *39:06:01
+++++---	-----	-----	-----	*39:02:01, *39:59 = *39:02:02, *39:59
+++++---	-----	-----	-----	*39:02:01, *39:19:01 = *39:02:01, *39:19:02 = *39:02:02, *39:19:02
+++++---	-----	-----	-----	*39:19:01, *39:39 = *39:19:02, *39:39
+++++---	-----	-----	-----	*39:23, *39:33 = *39:23, *39:40N
+++++---	-----	-----	-----	*39:23, *39:36 = *39:23, *39:53
+++++---	-----	-----	-----	*39:02:01, *39:18 = *39:02:02, *39:18
+++++---	-----	-----	-----	*39:02:01, *39:33 = *39:02:01, *39:40N = *39:02:02, *39:33 = *39:02:02, *39:40N
+++++---	-----	-----	-----	*39:02:01, *39:36 = *39:02:01, *39:53 = *39:02:02, *39:36 = *39:02:02, *39:53
+++++---	-----	-----	-----	*39:33, *39:39 = *39:39, *39:40N
+++++---	-----	-----	-----	*39:36, *39:39 = *39:39, *39:53
+++++---	-----	-----	-----	*39:02:01, *39:15 = *39:02:02, *39:15
+++++---	-----	-----	-----	*39:01:05, *39:23 = *39:02:01, *39:27 = *39:02:02, *39:27 = *39:23, *39:27
+++++---	-----	-----	-----	*39:23, *39:41 = *39:23, *39:42
+++++---	-----	-----	-----	*39:02:01, *39:44 = *39:02:02, *39:44 = *39:23, *39:44
+++++---	-----	-----	-----	*39:02:01, *39:38Q = *39:02:02, *39:38Q
+++++---	-----	-----	-----	*39:02:01, *39:12 = *39:02:01, *39:31 = *39:02:02, *39:31
+++++---	-----	-----	-----	*39:12, *39:39 = *39:31, *39:39
+++++---	-----	-----	-----	*39:02:01, *39:09 = *39:02:02, *39:09
+++++---	-----	-----	-----	*39:02:01, *39:25N = *39:02:02, *39:25N
+++++---	-----	-----	-----	*39:01:05, *39:02:01 = *39:01:05, *39:02:02
+++++---	-----	-----	-----	*39:02:01, *39:28 = *39:02:01, *39:45 = *39:02:02, *39:28
+++++---	-----	-----	-----	*39:01:01:02L, *39:02:01 = *39:01:01:02L, *39:02:02
+++++---	-----	-----	-----	*39:02:01, *39:32 = *39:02:02, *39:32
+++++---	-----	-----	-----	*39:02:01, *39:48 = *39:02:02, *39:48
+++++---	-----	-----	-----	*39:02:01, *39:34 = *39:02:02, *39:34
+++++---	-----	-----	-----	*39:02:01, *39:35 = *39:02:02, *39:35
+++++---	-----	-----	-----	*39:02:01, *39:30 = *39:02:02, *39:30
+++++---	-----	-----	-----	*39:02:01, *39:41 = *39:02:01, *39:42 = *39:02:02, *39:41 = *39:02:02, *39:42
+++++---	-----	-----	-----	*39:01:04, *39:02:01 = *39:01:09, *39:02:01 = *39:22, *39:39
+++++---	-----	-----	-----	*39:02:01, *39:22 = *39:02:02, *39:22
+++++---	-----	-----	-----	*39:28, *39:39 = *39:39, *39:45
+++++---	-----	-----	-----	*39:39, *39:41 = *39:39, *39:42
+++++---	-----	-----	-----	*39:01:04, *39:39 = *39:01:09, *39:39
+++++---	-----	-----	-----	*39:04, *39:29 = *39:29, *39:46
+++++---	-----	-----	-----	*39:17, *39:46 = *39:17, *39:47

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+++--+	-----+	--+---++	-----	*39:04, *39:14 = *39:14, *39:46
+++--+	-----	--+---++	-----+	*39:04, *39:24 = *39:24, *39:46
+++--+	-----	--+---++	-----	*39:03, *39:04 = *39:03, *39:46
+++--+	-----+	--+---++	-----	*39:19:01, *39:29 = *39:19:02, *39:29
+++--+	-----	--+---++	-----	*39:14, *39:19:01 = *39:14, *39:19:02
+++--+	-----	--+---++	-----+	*39:19:01, *39:24 = *39:19:02, *39:24
+++--+	-----	--+---++	-----	*39:03, *39:19:01 = *39:03, *39:19:02
+++--+	-----	--+---++	-----	*39:17, *39:33 = *39:17, *39:40N
+++--+	-----	--+---++	-----	*39:17, *39:36 = *39:17, *39:53
+++--+	-----	--+---++	-----	*39:10, *39:29 = *39:17, *39:29
+++--+	-----	--+---++	-----	*39:12, *39:29 = *39:29, *39:31 = *39:29, *39:54
+++--+	-----	--+---++	-----	*39:01:05, *39:29 = *39:09, *39:29
+++--+	-----	--+---++	-----+	*39:29, *39:35 = *39:29, *39:52
+++--+	-----	--+---++	-----+	*39:29, *39:41 = *39:29, *39:42
+++--+	-----	--+---++	-----	*39:01:04, *39:29 = *39:01:09, *39:29 = *39:14, *39:15 = *39:15, *39:29
+++--+	-----	--+---++	-----	*39:03, *39:29 = *39:14, *39:29 = *39:29, *39:29
+++--+	-----	--+---++	-----	*39:10, *39:14 = *39:14, *39:17
+++--+	-----	--+---++	-----	*39:03, *39:16 = *39:14, *39:16
+++--+	-----	--+---++	-----+	*39:10, *39:24 = *39:17, *39:24 = *39:17, *39:41 = *39:17, *39:42
+++--+	-----	--+---++	-----	*39:03, *39:10 = *39:03, *39:17
+++--+	-----	--+---++	-----	*39:12, *39:14 = *39:14, *39:31 = *39:14, *39:54
+++--+	-----	--+---++	-----+	*39:12, *39:24 = *39:24, *39:31 = *39:24, *39:54
+++--+	-----	--+---++	-----	*39:03, *39:12 = *39:03, *39:31 = *39:03, *39:54
+++--+	-----	--+---++	-----	*39:01:05, *39:14 = *39:03, *39:09 = *39:09, *39:14
+++--+	-----	--+---++	-----	*39:14, *39:35 = *39:14, *39:52
+++--+	-----	--+---++	-----+	*39:14, *39:41 = *39:14, *39:42
+++--+	-----	--+---++	-----	*39:01:04, *39:14 = *39:01:09, *39:14
+++--+	-----	--+---++	-----	*39:03, *39:14 = *39:14, *39:14
+++--+	-----	--+---++	-----+	*39:24, *39:35 = *39:24, *39:52
+++--+	-----	--+---++	-----+	*39:03, *39:35 = *39:03, *39:52
+++--+	-----	--+---++	-----+	*39:01:04, *39:24 = *39:01:09, *39:24 = *39:03, *39:41 = *39:03, *39:42 = *39:24, *39:41 = *39:24, *39:42
+++--+	-----	--+---++	-----	*39:01:04, *39:03 = *39:01:09, *39:03
+++--+	-----	--+---++	-----+	*39:03, *39:24 = *39:24, *39:24
+++--+	-----	--+---++	-----	*39:04, *39:57 = *39:46, *39:57
+++--+	-----	--+---++	-----	*39:04, *39:06:01 = *39:06:01, *39:46 = *39:50, *39:59
+++--+	-----	--+---++	-----	*39:04, *39:59 = *39:46, *39:59 = *39:47, *39:59
+++--+	-----	--+---++	-----	*39:19:01, *39:50 = *39:19:02, *39:50
+++--+	-----	--+---++	-----	*39:04, *39:19:02 = *39:19:01, *39:46 = *39:19:01, *39:47 = *39:19:02, *39:46 = *39:19:02, *39:47
+++--+	-----	--+---++	-----+	*39:04, *39:18 = *39:18, *39:46 = *39:18, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:33 = *39:04, *39:40N = *39:33, *39:46 = *39:40N, *39:46 = *39:40N, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:36 = *39:04, *39:53 = *39:36, *39:46 = *39:46, *39:53 = *39:47, *39:53
+++--+	-----	--+---++	-----	*39:04, *39:15 = *39:15, *39:46 = *39:15, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:27 = *39:27, *39:46 = *39:27, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:44 = *39:44, *39:46 = *39:44, *39:47
+++--+	-----	--+---++	-----	*39:10, *39:46 = *39:10, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:38Q = *39:38Q, *39:46 = *39:38Q, *39:47
+++--+	-----	--+---++	-----	*39:12, *39:50 = *39:31, *39:50 = *39:50, *39:54
+++--+	-----	--+---++	-----	*39:04, *39:31 = *39:04, *39:54 = *39:12, *39:46 = *39:12, *39:47 = *39:31, *39:46 = *39:31, *39:47 = *39:46, *39:54 = *39:47, *39:54
+++--+	-----	--+---++	-----	*39:04, *39:09 = *39:09, *39:46 = *39:09, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:25N = *39:25N, *39:46 = *39:25N, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:22 = *39:22, *39:46 = *39:22, *39:47
+++--+	-----	--+---++	-----	*39:01:05, *39:04 = *39:01:05, *39:46 = *39:01:05, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:28 = *39:28, *39:46 = *39:45, *39:46 = *39:45, *39:47
+++--+	-----	--+---++	-----	*39:01:01:02L, *39:04 = *39:01:01:02L, *39:46 = *39:01:01:02L, *39:47
+++--+	-----	--+---++	-----	*39:04, *39:32 = *39:32, *39:46
+++--+	-----	--+---++	-----	*39:04, *39:48 = *39:46, *39:48 = *39:47, *39:48
+++--+	-----	--+---++	-----	*39:35, *39:50 = *39:50, *39:52
+++--+	-----	--+---++	-----	*39:04, *39:34 = *39:34, *39:46
+++--+	-----	--+---++	-----	*39:01:04, *39:50 = *39:01:09, *39:50 = *39:04, *39:50 = *39:46, *39:50
+++--+	-----	--+---++	-----	*39:04, *39:35 = *39:04, *39:52 = *39:35, *39:46 = *39:35, *39:47 = *39:46, *39:52 = *39:47, *39:52
+++--+	-----	--+---++	-----	*39:04, *39:30 = *39:30, *39:46
+++--+	-----	--+---++	-----	*39:04, *39:41 = *39:04, *39:42 = *39:41, *39:46 = *39:41, *39:47 = *39:42, *39:46
+++--+	-----	--+---++	-----	*39:01:04, *39:04 = *39:01:04, *39:46 = *39:01:04, *39:47 = *39:01:09, *39:46 = *39:01:09, *39:47 = *39:04, *39:46 = *39:04, *39:47 = *39:46, *39:46 = *39:46, *39:47
+++--+	-----	--+---++	-----	*39:01:09, *39:04 = *39:04, *39:04
+++--+	-----	--+---++	-----	*39:19:01, *39:57 = *39:19:02, *39:57
+++--+	-----	--+---++	-----	*39:06:01, *39:19:01 = *39:06:01, *39:19:02

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++-+---	++-----	--+---++	-----	*39:19:01, *39:59 = *39:19:02, *39:59
++-+---	++-----	--+---++	-----	*39:12, *39:57 = *39:31, *39:57 = *39:54, *39:57
++-+---	++-----	--+---++	-----	*39:06:01, *39:18 = *39:18, *39:57
++-+---	++-----	--+---++	-----	*39:06:01, *39:40N = *39:40N, *39:57
++-+---	++-----	--+---++	-----	*39:33, *39:59 = *39:40N, *39:59
++-+---	++-----	--+---++	-----	*39:35, *39:57 = *39:52, *39:57
++-+---	++-----	--+---++	-----	*39:01:04, *39:57 = *39:01:09, *39:57 = *39:06:01, *39:53 = *39:53, *39:57 = *39:57, *39:59
++-+---	++-----	--+---++	-----	*39:36, *39:59 = *39:53, *39:59
++-+---	++-----	--+---++	-----	*39:06:01, *39:12 = *39:06:01, *39:31 = *39:06:01, *39:54
++-+---	++-----	--+---++	-----	*39:12, *39:59 = *39:31, *39:59 = *39:54, *39:59
++-+---	++-----	--+---++	-----	*39:28, *39:59 = *39:45, *39:59
++-+---	++-----	--+---++	-----	*39:06:01, *39:35 = *39:06:01, *39:52
++-+---	++-----	--+---++	-----	*39:01:04, *39:06:01 = *39:01:09, *39:06:01 = *39:06:01, *39:59
++-+---	++-----	--+---++	-----	*39:35, *39:59 = *39:52, *39:59
++-+---	++-----	--+---++	-----	*39:41, *39:59 = *39:42, *39:59
++-+---	++-----	--+---++	-----	*39:01:04, *39:59 = *39:01:09, *39:59 = *39:59, *39:59
++-+---	++-----	--+---++	-----	*39:18, *39:19:01 = *39:18, *39:19:02
++-+---	++-----	--+---++	-----	*39:19:01, *39:33 = *39:19:01, *39:40N = *39:19:02, *39:33 = *39:19:02, *39:40N
++-+---	++-----	--+---++	-----	*39:19:01, *39:36 = *39:19:01, *39:53 = *39:19:02, *39:36 = *39:19:02, *39:53
++-+---	++-----	--+---++	-----	*39:15, *39:19:01 = *39:15, *39:19:02
++-+---	++-----	--+---++	-----	*39:19:01, *39:27 = *39:19:02, *39:27
++-+---	++-----	--+---++	-----	*39:19:01, *39:44 = *39:19:02, *39:44
++-+---	++-----	--+---++	-----	*39:19:01, *39:38Q = *39:19:02, *39:38Q
++-+---	++-----	--+---++	-----	*39:12, *39:19:02 = *39:19:01, *39:31 = *39:19:01, *39:54 = *39:19:02, *39:31 = *39:19:02, *39:54
++-+---	++-----	--+---++	-----	*39:09, *39:19:01 = *39:09, *39:19:02
++-+---	++-----	--+---++	-----	*39:19:01, *39:25N = *39:19:02, *39:25N
++-+---	++-----	--+---++	-----	*39:19:01, *39:22 = *39:19:02, *39:22
++-+---	++-----	--+---++	-----	*39:01:05, *39:19:01 = *39:01:05, *39:19:02
++-+---	++-----	--+---++	-----	*39:19:01, *39:28 = *39:19:02, *39:28 = *39:19:02, *39:45
++-+---	++-----	--+---++	-----	*39:01:01:02L, *39:19:01 = *39:01:01:02L, *39:19:02
++-+---	++-----	--+---++	-----	*39:19:01, *39:32 = *39:19:02, *39:32
++-+---	++-----	--+---++	-----	*39:19:01, *39:48 = *39:19:02, *39:48
++-+---	++-----	--+---++	-----	*39:19:01, *39:34 = *39:19:02, *39:34
++-+---	++-----	--+---++	-----	*39:19:01, *39:35 = *39:19:01, *39:52 = *39:19:02, *39:35 = *39:19:02, *39:52
++-+---	++-----	--+---++	-----	*39:19:01, *39:30 = *39:19:02, *39:30
++-+---	++-----	--+---++	-----	*39:19:01, *39:41 = *39:19:01, *39:42 = *39:19:02, *39:41 = *39:19:02, *39:42
++-+---	++-----	--+---++	-----	*39:01:04, *39:19:02 = *39:01:09, *39:19:02 = *39:19:01, *39:19:02 = *39:19:02, *39:19:02
++-+---	++-----	--+---++	-----	*39:15, *39:33 = *39:15, *39:40N
++-+---	++-----	--+---++	-----	*39:15, *39:36 = *39:15, *39:53
++-+---	++-----	--+---++	-----	*39:27, *39:33 = *39:27, *39:40N
++-+---	++-----	--+---++	-----	*39:18, *39:27 = *39:18, *39:44
++-+---	++-----	--+---++	-----	*39:27, *39:36 = *39:27, *39:53
++-+---	++-----	--+---++	-----	*39:33, *39:44 = *39:40N, *39:44
++-+---	++-----	--+---++	-----	*39:36, *39:44 = *39:44, *39:53
++-+---	++-----	--+---++	-----	*39:10, *39:33 = *39:10, *39:40N
++-+---	++-----	--+---++	-----	*39:10, *39:36 = *39:10, *39:53
++-+---	++-----	--+---++	-----	*39:12, *39:18 = *39:18, *39:31 = *39:18, *39:54
++-+---	++-----	--+---++	-----	*39:33, *39:38Q = *39:38Q, *39:40N
++-+---	++-----	--+---++	-----	*39:36, *39:38Q = *39:38Q, *39:53
++-+---	++-----	--+---++	-----	*39:12, *39:33 = *39:12, *39:40N = *39:31, *39:33 = *39:31, *39:40N = *39:33, *39:54 = *39:40N, *39:54
++-+---	++-----	--+---++	-----	*39:12, *39:36 = *39:12, *39:53 = *39:31, *39:36 = *39:31, *39:53 = *39:36, *39:54 = *39:53, *39:54
++-+---	++-----	--+---++	-----	*39:09, *39:33 = *39:09, *39:40N
++-+---	++-----	--+---++	-----	*39:09, *39:36 = *39:09, *39:53
++-+---	++-----	--+---++	-----	*39:25N, *39:33 = *39:25N, *39:40N
++-+---	++-----	--+---++	-----	*39:25N, *39:36 = *39:25N, *39:53
++-+---	++-----	--+---++	-----	*39:22, *39:33 = *39:22, *39:40N
++-+---	++-----	--+---++	-----	*39:22, *39:36 = *39:22, *39:53
++-+---	++-----	--+---++	-----	*39:18, *39:28 = *39:18, *39:45
++-+---	++-----	--+---++	-----	*39:18, *39:33 = *39:18, *39:40N
++-+---	++-----	--+---++	-----	*39:01:05, *39:33 = *39:01:05, *39:40N
++-+---	++-----	--+---++	-----	*39:18, *39:41 = *39:18, *39:42
++-+---	++-----	--+---++	-----	*39:01:04, *39:18 = *39:01:05, *39:18 = *39:01:09, *39:18 = *39:18, *39:18 = *39:18, *39:35 = *39:18, *39:36 = *39:18, *39:52 = *39:18, *39:53
++-+---	++-----	--+---++	-----	*39:01:05, *39:36 = *39:01:05, *39:53
++-+---	++-----	--+---++	-----	*39:28, *39:40N = *39:33, *39:45 = *39:40N, *39:45
++-+---	++-----	--+---++	-----	*39:28, *39:53 = *39:36, *39:45 = *39:45, *39:53
++-+---	++-----	--+---++	-----	*39:01:01:02L, *39:33 = *39:01:01:02L, *39:40N
++-+---	++-----	--+---++	-----	*39:01:01:02L, *39:36 = *39:01:01:02L, *39:53

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+++++----	-----	---+++++	---+-----	*39:32, *39:40N = *39:32, *39:53 = *39:33, *39:48 = *39:40N, *39:48
+++++----	-----	---+++++	---+-----	*39:36, *39:48 = *39:48, *39:53
+++++----	-----	---+++++	---+-----	*39:33, *39:35 = *39:33, *39:52 = *39:35, *39:40N = *39:40N, *39:52
+++++----	-----	---+++++	---+-----	*39:33, *39:41 = *39:40N, *39:41 = *39:40N, *39:42
+++++----	-----	---+++++	---+-----	*39:01:04, *39:33 = *39:01:04, *39:40N = *39:01:09, *39:33 = *39:01:09, *39:40N = *39:33, *39:40N = *39:33, *39:53 = *39:36, *39:40N = *39:40N, *39:40N = *39:40N, *39:53
+++++----	-----	---+++++	-----+	*39:35, *39:36 = *39:35, *39:53 = *39:36, *39:52 = *39:52, *39:53
+++++----	-----	---+++++	-----+	*39:36, *39:41 = *39:41, *39:53 = *39:42, *39:53
+++++----	-----	---+++++	-----	*39:01:04, *39:36 = *39:01:04, *39:53 = *39:01:09, *39:36 = *39:01:09, *39:53 = *39:36, *39:53 = *39:53, *39:53
+++++----	-----	---+++++	-----	*39:12, *39:15 = *39:15, *39:31 = *39:15, *39:54
+++++----	-----	---+++++	-----	*39:15, *39:28 = *39:15, *39:45
+++++----	-----	---+++++	-----+	*39:15, *39:35 = *39:15, *39:52
+++++----	-----	---+++++	-----+	*39:15, *39:41 = *39:15, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:15 = *39:01:09, *39:15 = *39:15, *39:15
+++++----	-----	---+++++	-----	*39:12, *39:27 = *39:27, *39:31 = *39:27, *39:54
+++++----	-----	---+++++	-----	*39:12, *39:44 = *39:31, *39:44 = *39:44, *39:54
+++++----	-----	---+++++	-----	*39:09, *39:27 = *39:09, *39:44
+++++----	-----	---+++++	-----	*39:27, *39:28 = *39:27, *39:45
+++++----	-----	---+++++	-----+	*39:27, *39:35 = *39:27, *39:52
+++++----	-----	---+++++	-----+	*39:27, *39:41 = *39:27, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:27 = *39:01:05, *39:27 = *39:01:05, *39:44 = *39:01:09, *39:27 = *39:27, *39:27 = *39:27, *39:44
+++++----	-----	---+++++	-----	*39:28, *39:44 = *39:44, *39:45
+++++----	-----	---+++++	-----+	*39:35, *39:44 = *39:44, *39:52
+++++----	-----	---+++++	-----+	*39:41, *39:44 = *39:42, *39:44
+++++----	-----	---+++++	-----	*39:01:04, *39:44 = *39:01:09, *39:44 = *39:44, *39:44
+++++----	-----	---+++++	-----	*39:01:05, *39:16 = *39:09, *39:10 = *39:09, *39:16
+++++----	-----	---+++++	-----+	*39:16, *39:41 = *39:16, *39:42
+++++----	-----	---+++++	-----+	*39:10, *39:41 = *39:10, *39:42
+++++----	-----	---+++++	-----	*39:09, *39:12 = *39:09, *39:31 = *39:09, *39:54
+++++----	-----	---+++++	-----	*39:12, *39:25N = *39:25N, *39:31 = *39:25N, *39:54
+++++----	-----	---+++++	-----	*39:12, *39:22 = *39:22, *39:31 = *39:22, *39:54
+++++----	-----	---+++++	-----	*39:01:05, *39:12 = *39:01:05, *39:31 = *39:01:05, *39:54
+++++----	-----	---+++++	-----+	*39:28, *39:38Q = *39:38Q, *39:45
+++++----	-----	---+++++	-----	*39:12, *39:28 = *39:28, *39:31 = *39:28, *39:54 = *39:31, *39:45 = *39:45, *39:54
+++++----	-----	---+++++	-----	*39:01:01:02L, *39:12 = *39:01:01:02L, *39:31 = *39:01:01:02L, *39:54
+++++----	-----	---+++++	-----+	*39:12, *39:32 = *39:31, *39:32 = *39:32, *39:38Q = *39:32, *39:54
+++++----	-----	---+++++	-----+	*39:35, *39:38Q = *39:38Q, *39:52
+++++----	-----	---+++++	-----+	*39:38Q, *39:41 = *39:38Q, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:38Q = *39:01:09, *39:38Q = *39:12, *39:38Q = *39:12, *39:48 = *39:31, *39:38Q = *39:31, *39:48 = *39:38Q, *39:38Q = *39:38Q, *39:48 = *39:38Q, *39:54 = *39:48, *39:54
+++++----	-----	---+++++	-----+	*39:12, *39:34 = *39:31, *39:34 = *39:34, *39:54
+++++----	-----	---+++++	-----	*39:12, *39:35 = *39:12, *39:52 = *39:31, *39:35 = *39:31, *39:52 = *39:35, *39:54
+++++----	-----	---+++++	-----+	*39:12, *39:30 = *39:30, *39:31 = *39:30, *39:54
+++++----	-----	---+++++	-----+	*39:12, *39:41 = *39:12, *39:42 = *39:31, *39:41 = *39:31, *39:42 = *39:41, *39:54 = *39:42, *39:54
+++++----	-----	---+++++	-----	*39:01:04, *39:12 = *39:01:04, *39:31 = *39:01:04, *39:54 = *39:01:09, *39:31 = *39:01:09, *39:54 = *39:12, *39:31 = *39:12, *39:54 = *39:31, *39:31 = *39:31, *39:54
+++++----	-----	---+++++	-----	*39:01:09, *39:12 = *39:12, *39:12
+++++----	-----	---+++++	-----	*39:09, *39:28 = *39:09, *39:45
+++++----	-----	---+++++	-----	*39:09, *39:35 = *39:09, *39:52
+++++----	-----	---+++++	-----+	*39:09, *39:41 = *39:09, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:09 = *39:01:05, *39:09 = *39:01:09, *39:09 = *39:09, *39:09
+++++----	-----	---+++++	-----	*39:25N, *39:28 = *39:25N, *39:45
+++++----	-----	---+++++	-----	*39:25N, *39:35 = *39:25N, *39:52
+++++----	-----	---+++++	-----+	*39:25N, *39:41 = *39:25N, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:25N = *39:01:09, *39:25N = *39:25N, *39:25N
+++++----	-----	---+++++	-----	*39:22, *39:28 = *39:22, *39:45
+++++----	-----	---+++++	-----	*39:22, *39:35 = *39:22, *39:52
+++++----	-----	---+++++	-----+	*39:22, *39:41 = *39:22, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:22 = *39:01:09, *39:22
+++++----	-----	---+++++	-----	*39:01:05, *39:28 = *39:01:05, *39:45
+++++----	-----	---+++++	-----	*39:01:05, *39:35 = *39:01:05, *39:52
+++++----	-----	---+++++	-----	*39:01:05, *39:41 = *39:01:05, *39:42
+++++----	-----	---+++++	-----	*39:01:04, *39:01:05 = *39:01:05, *39:01:05 = *39:01:05, *39:01:09
+++++----	-----	---+++++	-----	*39:01:01:02L, *39:28 = *39:01:01:02L, *39:45
+++++----	-----	---+++++	-----	*39:28, *39:48 = *39:45, *39:48
+++++----	-----	---+++++	-----	*39:28, *39:35 = *39:28, *39:52 = *39:35, *39:45 = *39:45, *39:52
+++++----	-----	---+++++	-----	*39:28, *39:41 = *39:28, *39:42 = *39:41, *39:45 = *39:42, *39:45



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++-+---	-----	--+-----	-----	*39:01:04, *39:28 = *39:01:04, *39:45 = *39:01:09, *39:28 = *39:28, *39:45
++-+---	-----	--+-----	-----	*39:01:09, *39:45 = *39:45, *39:45
++-+---	-----	--+-----	-----	*39:01:01:02L, *39:35 = *39:01:01:02L, *39:52
++-+---	-----	--+-----	-----	*39:01:01:02L, *39:41 = *39:01:01:02L, *39:42
++-+---	-----	--+-----	-----	*39:01:01:02L, *39:01:01:02L = *39:01:01:02L, *39:01:04 = *39:01:01:02L, *39:01:09
++-+---	-----	--+-----	-----	*39:32, *39:35 = *39:32, *39:52
++-+---	-----	--+-----	-----	*39:01:04, *39:32 = *39:01:09, *39:32 = *39:32, *39:48
++-+---	-----	--+-----	-----	*39:35, *39:48 = *39:48, *39:52
++-+---	-----	--+-----	-----	*39:41, *39:48 = *39:42, *39:48
++-+---	-----	--+-----	-----	*39:01:04, *39:48 = *39:01:09, *39:48 = *39:48, *39:48
++-+---	-----	--+-----	-----	*39:34, *39:35 = *39:34, *39:52
++-+---	-----	--+-----	-----	*39:01:04, *39:34 = *39:01:09, *39:34
++-+---	-----	--+-----	-----	*39:30, *39:35 = *39:30, *39:52
++-+---	-----	--+-----	-----	*39:35, *39:41 = *39:35, *39:42 = *39:41, *39:52 = *39:42, *39:52
++-+---	-----	--+-----	-----	*39:01:04, *39:35 = *39:01:04, *39:52 = *39:01:09, *39:35 = *39:01:09, *39:52 = *39:35, *39:35 = *39:35, *39:52
++-+---	-----	--+-----	-----	*39:01:04, *39:30 = *39:01:09, *39:30
++-+---	-----	--+-----	-----	*39:01:04, *39:41 = *39:01:04, *39:42 = *39:01:09, *39:41 = *39:01:09, *39:42 = *39:41, *39:41 = *39:41, *39:42
++-+---	-----	--+-----	-----	*39:01:04, *39:01:04 = *39:01:04, *39:01:09
++-+---	-----	--+-----	-----	*39:01:09, *39:19:01 = *39:19:01, *39:19:01
++-+---	-----	--+-----	-----	*39:08, *39:10 = *39:08, *39:20
++-+---	-----	--+-----	-----	*39:02:02, *39:08 = *39:08, *39:08 = *39:08, *39:13:01
++-+---	-----	--+-----	-----	*39:10, *39:49 = *39:20, *39:49
++-+---	-----	--+-----	-----	*39:02:02, *39:49 = *39:13:01, *39:49 = *39:49, *39:49
++-+---	-----	--+-----	-----	*39:02:02, *39:20 = *39:10, *39:13:01 = *39:13:01, *39:20
++-+---	-----	--+-----	-----	*39:02:02, *39:13:01 = *39:13:01, *39:13:01
++-+---	-----	--+-----	-----	*39:10, *39:20 = *39:20, *39:20
++-+---	-----	--+-----	-----	*39:02:01, *39:58 = *39:02:02, *39:58
++-+---	-----	--+-----	-----	*39:02:01, *39:54 = *39:02:02, *39:54
++-+---	-----	--+-----	-----	*39:02:01, *39:52 = *39:02:02, *39:52
++-+---	-----	--+-----	-----	*39:02:01, *39:39 = *39:02:02, *39:39
++-+---	-----	--+-----	-----	*39:02:01, *39:02:01 = *39:02:01, *39:02:02
++-+---	-----	--+-----	-----	*39:02:02, *39:23 = *39:23, *39:23
++-+---	-----	--+-----	-----	*39:10, *39:17 = *39:17, *39:17
++-+---	-----	--+-----	-----	*39:30, *39:43 = *39:43, *39:43
++-+---	-----	--+-----	-----	*39:47, *39:57 = *39:50, *39:57
++-+---	-----	--+-----	-----	*39:06:01, *39:47 = *39:06:01, *39:50
++-+---	-----	--+-----	-----	*39:30, *39:50 = *39:34, *39:47 = *39:34, *39:50
++-+---	-----	--+-----	-----	*39:47, *39:50 = *39:50, *39:50
++-+---	-----	--+-----	-----	*39:06:01, *39:33 = *39:33, *39:57
++-+---	-----	--+-----	-----	*39:30, *39:57 = *39:34, *39:57
++-+---	-----	--+-----	-----	*39:06:01, *39:36 = *39:06:01, *39:57 = *39:36, *39:57 = *39:57, *39:57
++-+---	-----	--+-----	-----	*39:06:01, *39:30 = *39:06:01, *39:34
++-+---	-----	--+-----	-----	*39:32, *39:33 = *39:32, *39:36
++-+---	-----	--+-----	-----	*39:33, *39:33 = *39:33, *39:36
++-+---	-----	--+-----	-----	*39:30, *39:34 = *39:34, *39:34

39:01 = 39:01:01:01, 39:01:03, 39:01:06-39:01:08 and 39:01:10
39:01:01:02L = 39:01:01:02L and 39:60
39:06 = 39:06:01-39:06:02
39:13 = 39:13:01-39:13:02

SPECIFICITY TABLE**HLA-B*39 SSP subtyping**

Specificities and sizes of the PCR products of the 32 primer mixes used for HLA-B*39 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-B*39 alleles ³	Other amplified HLA-Class I alleles ⁴
1	230 bp	800 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:05:02, 39:07-39:20, 39:22-39:29, 39:31, 39:35, 39:37-39:41, 39:44-39:46, 39:48-39:49, 39:51-39:56, 39:58-39:60	*08:55, 15:69, 15:186, 38:01:01-38:07, 38:09, 38:11-38:14, 38:16-38:19, 38:21-38:22, 58:20, 67:01:01-67:02, C*06:40, C*07:137
2	170 bp	1070 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:01:11, 39:03-39:07, 39:09, 39:11-39:12, 39:14-39:15, 39:18-39:19:02, 39:22, 39:24-39:38Q, 39:40N-39:48, 39:50-39:51, 39:53, 39:55-39:57, 39:59-39:60	*07:69, 07:85, 14:01-14:18, 15:09-15:10:02, 15:18:01-15:18:04, 15:23, 15:37, 15:51-15:52, 15:72, 15:80, 15:90, 15:93, 15:99, 15:108, 15:114-15:115, 15:119, 15:124, 15:133-15:134, 15:153, 15:161, 15:176, 15:186, 15:197-15:198, 15:200, 18:33, 38:01:01-38:02:02, 38:04-38:05, 38:08-38:15, 38:17-38:23
3	200 bp	800 bp	*39:05:01-39:05:02, 39:07-39:08, 39:11, 39:13:01-39:13:02, 39:20, 39:37, 39:43, 39:49, 39:55-39:56	*07:16, 07:27, 07:37-07:38, 07:50, 07:75, 07:91, 08:03, 08:23, 08:54, 14:14, 14:18, 15:03:01-15:03:03, 15:09-15:10:02, 15:18:01-15:18:04, 15:23, 15:29, 15:37-15:38:02, 15:47, 15:49, 15:51-15:52, 15:54, 15:62, 15:64, 15:68-15:69, 15:72, 15:74, 15:80, 15:90-15:91, 15:93, 15:98-15:99, 15:103, 15:108, 15:114-15:115, 15:119, 15:123-15:124, 15:127, 15:131-15:134, 15:151, 15:153, 15:156, 15:158, 15:161, 15:173, 15:176,

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				15:185-15:186, 15:197-15:198, 15:200, 18:01:01-18:15, 18:17N-18:50, 35:21, 35:24:01-35:25, 35:124-35:125, 35:142, 37:01:01-37:21, 37:23, 38:01:01-38:02:02, 38:04-38:12, 38:15, 38:17-38:23, 40:12, 42:11, 48:01:01-48:02:01, 48:03:01-48:23, 51:37, 51:45, 51:63, 52:16, 53:02, 53:06, 57:14, 58:09, 58:12
4^{5,9}	65 bp, 145 bp, 385 bp	1070 bp	*39:26, 39:51, 39:58	
5⁵	105 bp	800 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:01:08, 39:01:10-39:02:01, 39:03-39:09, 39:11-39:12, 39:14-39:15, 39:18, 39:19:02, 39:22, 39:24-39:48, 39:50-39:60	*14:01-14:02:02, 14:02:04, 14:03-14:18, 15:189, 35:26, 67:01:01
6	170 bp	800 bp	*39:02:01-39:02:02, 39:08, 39:13:01-39:13:02, 39:23, 39:39, 39:49	*07:27, 07:50, 08:04, 08:17, 08:54, 15:03:01-15:03:03, 15:47, 15:54, 15:61-15:62, 15:64, 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, 18:01:01-18:03, 18:05-18:06, 18:08-18:15, 18:17N-18:28, 18:30-18:32, 18:34-18:50, 37:01:01-37:20, 37:23, 38:03, 40:12, 42:11, 48:01:01-48:02:01, 48:03:01-48:05, 48:07-48:23, 52:16
7^{6,10}	165 bp, 220 bp	1070 bp	*39:03, 39:14, 39:17, 39:24, 39:29, 39:37	*08:55, 38:19
8^{8,11}	180 bp, 405 bp	1070 bp	*39:04, 39:46-39:47, 39:50	*15:189, 35:26, 40:36, 40:77, 40:86, 48:07
9	220 bp	800 bp	*39:06:01-39:06:02, 39:57, 39:59	
10^{5,12}	105 bp, 165 bp	800 bp	*39:07, 39:19:01-39:19:02	*15:69, 15:186, 18:33, 35:35, 35:82, 35:85, 35:135, 51:22, 78:03

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11⁸	170 bp	1070 bp	*39:08, 39:11, 39:18, 39:33, 39:36, 39:40N, 39:53, 39:57	*07:78, 13:18, 13:31, 15:58, 15:73, 54:10, 54:20, 55:09, 55:21, 55:37, 56:19N
12	175 bp	800 bp	*39:07, 39:15, 39:29, 39:49, 39:55	*15:69, 15:186, 35:35
13^{5,13}	85 bp, 385 bp	800 bp	*39:23, 39:27, 39:44, 39:51	
14⁵	80 bp	1070 bp	*39:10, 39:16-39:17, 39:20	*07:02:01-07:07, 07:09, 07:11-07:12, 07:14-07:26, 07:28-07:31, 07:33-07:35, 07:37, 07:39-07:49N, 07:51-07:68:02, 07:70-07:80, 07:82, 07:84, 07:86-07:115, 15:11:01-15:11:05, 15:76, 15:101, 15:143, 15:148, 15:152, 35:76, 40:61, 42:01:01-42:02, 42:04-42:10, 42:12-42:14, 44:90, 45:06, 54:01-54:11, 54:13-54:23, 55:01:01-55:05, 55:07-55:17, 55:19-55:33, 55:35-55:43, 56:01:01-56:06, 56:09-56:13, 56:15-56:20, 56:22-56:29, 67:01:01-67:01:02, 81:01-81:04N, 82:01-82:03, 83:01
15^{5,14}	145 bp, 190 bp	800 bp	*39:12, 39:31, 39:38Q, 39:54	
16^{8,15}	165 bp, 220 bp	800 bp	*39:09, 39:14, 39:16, 39:29	*08:55, C*07:137
17	180 bp	800 bp	*39:25N	
18	160 bp	800 bp	*39:02:01-39:02:02, 39:08, 39:13:01-39:13:02, 39:22-39:23, 39:49	*08:17, 08:38, 08:54, 15:03:01-15:03:03, 15:47, 15:49, 15:54, 15:61-15:62, 15:68-15:69, 15:74, 15:91, 15:98, 15:103, 15:123, 15:127, 15:131-15:132, 15:151, 15:156, 15:158, 15:173, 18:12, 37:01:01-37:07, 37:09-37:21, 37:23, 38:03-38:04, 40:12, 42:11, 48:01:01-48:02:01, 48:03:01-48:05, 48:07-48:15, 48:17-48:23, 52:16
19	385 bp	1070 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:01:11, 39:03-39:07,	*07:02:01-07:12, 07:14-07:53, 07:55-07:64, 07:66-07:115, 08:01:01-08:05, 08:07-08:09, 08:11-08:16, 08:18-08:37,

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			39:09-39:12, 39:14-39:20, 39:24-39:48, 39:50-39:60	08:39-08:53, 08:55-08:62, 14:01-14:03, 14:05-14:18, 38:01:01-38:02:02, 38:05-38:23, 40:25?, 40:68?, 40:106?, 42:01:01-42:02, 42:04-42:10, 42:12-42:14, 48:06, 67:01:01-67:01:02, 73:01-73:02, 81:02
20 ^{5,8,16}	100 bp, 215 bp	800 bp	*39:01:05, 39:09, 39:18, 39:27	*15:69, 15:186, 38:01:03, C*07:137
21	220 bp	800 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:02:02, 39:04-39:05:02, 39:07-39:13:02, 39:15, 39:17-39:20, 39:22-39:23, 39:25N-39:27, 39:31, 39:35, 39:38Q-39:41, 39:42 ^w , 39:44-39:46, 39:48-39:49, 39:51-39:56, 39:58-39:60	*15:69, 15:186, 38:01:01-38:07, 38:08 ^w , 38:09, 38:11-38:18, 38:21, 58:20, 67:01:01-67:02, C*07:137
22 ^{5,17}	150 bp, 225 bp	800 bp	*39:28, 39:45	
23 ^{5,7}	85 bp	800 bp	*39:01:01:01-39:01:01:02L, 39:01:03, 39:01:05-39:01:08, 39:01:10-39:02:01, 39:03-39:04, 39:06:01-39:06:02, 39:09, 39:12, 39:14-39:15, 39:18, 39:19:02, 39:22, 39:24-39:36, 39:38Q-39:48, 39:50-39:54, 39:57-39:60	*14:01-14:02:02, 14:02:04-14:13, 14:15-14:17, 15:189, 38:14 ^w , 67:01:01
24 ⁷	185 bp	1070 bp	*39:01:01:01-39:01:01:02L, 39:01:03-39:01:08, 39:01:10-39:02:01, 39:03, 39:05:01-39:09, 39:11, 39:14-39:15, 39:18, 39:19:02, 39:22, 39:24-39:30, 39:31 ^w , 39:32-39:44, 39:46-39:48, 39:50-39:60	*14:01, 14:07N-14:08, 14:10, 14:12, 14:14, 38:01:01-38:03, 38:07-38:23, 67:01:01

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25¹⁸	150 bp, 235 bp	1070 bp	*39:01:01:02L, 39:60	C*15:31
26⁸	265 bp	800 bp		*14:01-14:04, 14:07N, 14:09, 14:11-14:12, 14:14-14:18, 18:44, C*01:30
27^{5,19}	70 bp, 195 bp	800 bp	*39:32, 39:38Q, 39:48	*13:15, 35:96, 35:109, 51:13:01-51:13:02, 51:19, 51:62, 51:92, 52:14
28^{5,7,8,20}	140 bp, 180 bp	1070 bp	*39:32-39:33, 39:40N, 39:56	*13:03, 15:58, 15:73, 15:133, 35:03:01-35:03:04, 35:06, 35:13, 35:36, 35:38, 35:55- 35:56, 35:59, 35:70, 35:74- 35:75, 35:84-35:85, 35:98, 35:106, 35:109, 35:127- 35:128, 35:136, 40:71, 44:10, 46:11, 51:13:01-51:13:02, 51:15, 51:62, 51:92, 52:14, 53:04, 54:03, 56:01:01-56:02, 56:04, 56:07-56:08, 56:11, 56:13-56:14, 56:16-56:17, 56:19N-56:20, 56:22, 56:24- 56:29, 59:04, 82:01-82:03, C*15:15
29	245 bp	800 bp	*39:06:01-39:06:02, 39:34, 39:50, 39:57	*07:78, 07:84, 08:09, 13:02:01- 13:02:09, 13:08Q-13:09, 13:14-13:16, 13:18-13:19, 13:27, 13:30-13:35, 13:37- 13:38, 15:42, 15:83, 27:14, 35:60, 40:06:01:01-40:06:03, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:95- 40:96, 40:103, 40:109-40:110, 40:127, 40:131, 41:01, 41:05- 41:07, 41:09, 41:12, 42:04, 45:08, 45:10, 46:18, 49:07, 51:10, 51:16, 51:21, 51:31, 51:34, 51:36, 51:82, 51:93, 52:08, 54:01-54:02, 54:04- 54:05N, 54:07-54:08N, 54:10- 54:23, 55:01:01-55:03, 55:05, 55:07, 55:09-55:13, 55:15- 55:43, 56:23, 59:01-59:03, 59:05, 73:01-73:02, 78:07
30^{5,8,21}	60 bp, 180 bp	800 bp	*39:18, 39:35, 39:52	*15:69, C*06:40
31⁸	155 bp	800 bp	*39:30, 39:34, 39:43	*07:48, 08:13, 08:25, 13:01:01-

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13:04, 13:06-13:15, 13:17,
13:19, 13:21-13:23, 13:25-
13:30, 13:32-13:39, 15:05:01-
15:05:02, 15:20, 15:31, 15:52,
15:55, 15:86, 15:91, 15:107,
15:114, 15:123-15:124,
15:151, 15:155, 15:185,
15:188, 18:01:01-18:12, 18:14,
18:17N-18:18, 18:20, 18:22-
18:29, 18:31-18:50, 27:01-
27:03, 27:05:02-27:05:14,
27:07-27:09, 27:11-27:14,
27:16-27:17, 27:19, 27:23,
27:26-27:39, 27:41-27:44,
27:46, 27:48-27:53, 27:55-
27:62, 27:64N-27:65N, 27:67,
35:01:01:01-35:07, 35:09:01-
35:10, 35:12:01-35:13, 35:15-
35:17, 35:19-35:20:02, 35:22-
35:34, 35:36-35:37, 35:39-
35:42:02, 35:46-35:57, 35:59-
35:60, 35:63-35:65Q,
35:68:01-35:72, 35:74-35:78,
35:81-35:85, 35:88-35:95,
35:97-35:98, 35:101:01-
35:101:02, 35:103-35:104,
35:106-35:114, 35:116,
35:119-35:134N, 35:136-
35:140, 35:143-35:145N,
37:02, 40:01:01-40:01:11,
40:02:01-40:04, 40:06:01:01-
40:14:03, 40:18-40:22N,
40:24-40:25, 40:27, 40:29-
40:31, 40:33-40:40, 40:42-
40:50, 40:52-40:94, 40:96-
40:97, 40:99-40:115, 40:117-
40:127, 40:129-40:135,
40:137-40:147, 44:03:01-
44:03:11, 44:07, 44:10, 44:13,
44:26, 44:30-44:32, 44:36-
44:40, 44:43, 44:45-44:47,
44:50, 44:54, 44:57, 44:60-
44:61N, 44:64:01-44:65, 44:69,
44:77, 44:81-44:82, 44:85,
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44:103, 44:105, 44:107-
44:110, 46:06, 46:11,
46:13:01-46:13:03, 46:18,

				46:21, 47:01:01:01-47:07, 48:01:01-48:04, 48:06-48:07, 48:09-48:14, 48:16-48:18, 48:20-48:23, 51:09:01-51:10, 51:15, 51:31, 51:40, 51:42, 51:73, 51:81, 51:91, 51:93, 52:03, 52:10, 53:01:01-53:05, 53:07, 53:09-53:10, 53:12- 53:15, 53:17-53:21, 53:23, 54:01-54:05N, 54:07-54:09, 54:11-54:19, 54:21-54:23, 55:02:01-55:02:06, 55:04, 55:07-55:08, 55:10, 55:12- 55:13, 55:16, 55:18-55:19, 55:22-55:23, 55:26-55:27, 55:30, 55:32, 55:34-55:35, 55:39, 55:41-55:43, 56:01:01- 56:02, 56:04, 56:07-56:12, 56:14-56:20, 56:22-56:24, 56:26-56:29, 57:01:01- 57:01:08, 57:03:01-57:03:02, 57:06-57:08, 57:10-57:11, 57:14-57:18, 57:20-57:21, 57:23, 57:25-57:26, 57:29, 57:31-57:32, 58:01:01-58:02, 58:04, 58:07, 58:09-58:18, 58:21, 58:23-58:30, 59:01- 59:05, 78:04, 81:01-81:05
32	230 bp	800 bp	*39:03 ^w , 39:14 ^w , 39:24, 39:29 ^w , 39:37 ^w , 39:41-39:42	*08:55 ^w , 35:35, 38:19 ^w , 38:20

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-B*39 SSP subtypings.

When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 bp or more. Size differences shorter than 20 bp are not given. For high resolution SSP kits the length of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

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 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.

PCR fragments longer than the control band may sometimes be observed. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B*39 subtyping.

In addition, wells number 3, 5, 6, 9, 10, 12, 13, 15 to 18, 20 to 23, 26, 27 and 29 to 32 contain the primer pair

giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

In the presence of a specific amplification the intensity of the control band often decreases.

³For many HLA-B alleles complete 4th exon 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. We assume that unknown sequences in the 4th exon are conserved within allelic groups.

The B*39:10 and B*67:01:02 alleles will give rise to identical amplification patterns with the HLA-B*39 subtyping kit. These two alleles can be distinguished by the HLA-B low resolution and/or HLA-B*67 kits.

The B*39:01:01:02L and B*39:60 alleles can be distinguished by the different sizes of the specific PCR products generated by primer mix 25.

⁴Due to the sharing of sequence motifs between HLA-B alleles, non-HLA-B*39 alleles will be amplified by primer mixes 1 to 3, 5 to 8, 10 to 12, 14, 16, 18 to 21, 23, 24 and 26 to 32. In addition, the C*01:30 allele will be amplified by primer mix 26, the C*06:40 allele will be amplified by primer mixes 1 and 30, the C*07:138 allele will be amplified by primer mixes 1, 16, 20 and 21, the C*15:15 allele will be amplified by primer mix 28, and the C*15:31 allele will be amplified by primer mix 25.

⁵Short specific PCR fragments are less intense and not as sharp as longer specific bands.

⁶The primer pairs in primer mix 7 may give rise to a primer oligomer artifact.

⁷Primer solutions 23, 24 and 28 may yield less specific PCR product than the other HLA-B*39 primer mixes.

⁸Primer mixes 8, 11, 16, 20, 26, 28, 30 and 31 may give rise to non-specific amplifications.

⁹Primer mix 4: Specific PCR fragment of 65 bp in the B*39:58 allele. Specific PCR fragment of 145 bp in the B*39:26 allele. Specific PCR fragment of 385 bp in the B*39:51 allele.

¹⁰Primer solution 7: Specific PCR fragment of 165 bp in the B*39:17 allele. Specific PCR fragment of 220 bp in the B*39:03, 39:14, 39:24, 39:29 and 39:37 and in the B*08:55 and 38:19 alleles.

¹¹Primer solution 8: Specific PCR fragment of 180 bp in the B*39:04, 39:47 and 39:50 and in the B*15:189, 35:26, 40:36, 40:77, 40:86 and 48:07 alleles. Specific PCR fragment of 405 bp in the B*39:46 allele.

¹²Primer solution 10: Specific PCR fragment of 105 bp in the B*39:19:01-39:19:02 and in the B*18:33, 35:82, 35:85, 35:135, 51:22 and 78:03 alleles. Specific PCR fragment of 165 bp in the B*39:07 and in the B*15:69, 15:186 and 35:35 alleles.

¹³Primer mix 13: Specific PCR fragment of 85 bp in the B*39:23, 39:27 and 39:44 alleles. Specific PCR fragment of 385 bp in the B*39:51 allele.

¹⁴Primer mix 15: Specific PCR fragment of 145 bp in the B*39:54 allele. Specific PCR fragments of 190 bp in the B*39:12, 39:31 and 39:38Q alleles.

¹⁵Primer solution 16: Specific PCR fragment of 165 bp in the B*39:14 and 39:29 and in the B*08:55 alleles. Specific PCR fragment of 220 bp in the B*39:09 and 39:16 and in the C*07:137 alleles.

¹⁶Primer solution 20: Specific PCR fragment of 100 bp in the B*39:01:05, 39:18 and 39:27 and in the B*15:69, 15:186 and 38:01:03 alleles. Specific PCR fragment of 215 bp in the B*39:09 and in the C*07:137 alleles.

¹⁷Primer solution 22: Specific PCR fragment of 150 bp in the B*39:45 allele. Specific PCR fragment of 225 bp in the B*39:28 allele.

¹⁸Primer solution 25: Specific PCR fragment of 150 bp in the B*39:60 and in the C*15:31 alleles. Specific PCR fragment of 235 bp in the B*39:01:01:02L allele.

¹⁹Primer mix 27: Specific PCR fragment of 70 bp in the B*39:48 and in the B*13:15, 35:96, 51:13:01-51:13:02, 51:19, 51:62, 51:92 and 52:14 alleles. Specific PCR fragment of 195 bp in the B*39:38Q and 39:48 alleles. Specific PCR fragments of 70 and 195 bp in the B*39:32 and in the B*35:109 alleles.

²⁰Primer mix 28: Specific PCR fragment of 140 bp in the B*39:56 allele. Specific PCR fragment of 180 bp in the B*39:32-39:33 and 39:40N and in the B*13:03, 15:58, 15:73, 15:133, 35:03:01-35:03:04, 35:06, 35:13, 35:36, 35:38, 35:55-35:56, 35:59, 35:70, 35:74-35:75, 35:84-35:85, 35:98, 35:106, 35:109, 35:127-35:128, 35:136, 40:71, 44:10, 46:11, 51:13:01-51:13:02, 51:15, 51:62, 51:92, 52:14, 53:04, 54:03, 56:01:01-56:02, 56:04, 56:07-56:08, 56:11, 56:13-56:14, 56:16-56:17, 56:19N-56:20, 56:22, 56:24-56:29, 59:04 and 82:01-82:03 and in the C*15:15 alleles.

²¹Primer mix 30: Specific PCR fragment of 60 bp in the B*39:18 and 39:35 and in the B*15:69 and in the C*06:40 alleles. Specific PCR fragment of 180 bp in the B*39:52 allele.

'w', might be weakly amplified.

'?', nucleotide sequence information not available for the primer matching sequence.

INTERPRETATION TABLE																
HLA-B*39 SSP subtyping																
Amplification patterns of the B*39:01 to 39:60 alleles																
	Well⁷															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Length of int.																
pos. control¹	800	1070	800	1070	800	800	1070	1070	800	800	1070	800	800	1070	800	800
5'-primer(s)²	355	142	142	246	246	142	363	106	357	206	419	412	246	272	97	360
	5'-CCC ^{3'}	5'-TCT ^{3'}	5'-TCT ^{3'}	5'-gAA ^{3'}	5'-gAA ^{3'}	5'-TCT ^{3'}	5'-AgC ^{3'}	5'-CCA ^{3'}	5'-Tgg ^{3'}	5'-gAC ^{3'}	5'-gTT ^{3'}	5'-ATg ^{3'}	5'-gAA ^{3'}	5'-CTA ^{3'}	5'-TCg ^{3'}	5'-CAC ^{3'}
	355		419	419	246		420	420	668	419			503		97	368
	5'-CTC ^{3'}		5'-gTC ^{3'}	5'-gTT ^{3'}	5'-gAA ^{3'}		5'-TTA ^{3'}	5'-TTC ^{3'}	5'-ggC ^{3'}	5'-gTC ^{3'}			5'-CCg ^{3'}		5'-TCC ^{3'}	5'-gTC ^{3'}
								646							141	419
								5'-ACg ^{3'}							5'-ATg ^{3'}	5'-gTA ^{3'}
															419	
															5'-gTT ^{3'}	
3'-primer(s)³	544	272	292	272	311	272	544	246	544	272	539	544	299	311	246	544
	5'-ggT ^{3'}	5'-TgC ^{3'}	5'-gTA ^{3'}	5'-TgA ^{3'}	5'-ggT ^{3'}	5'-Tgg ^{3'}	5'-ggT ^{3'}	5'-TAT ^{3'}	5'-ggT ^{3'}	5'-TgC ^{3'}	5'-TCC ^{3'}	5'-ggT ^{3'}	5'-TCA ^{3'}	5'-ggT ^{3'}	5'-TAT ^{3'}	5'-ggT ^{3'}
			292	344				559	839	544	539		344		563	
			5'-gTA ^{3'}	5'-ACg ^{3'}				5'-CTC ^{3'}	5'-ATA ^{3'}	5'-ggT ^{3'}	5'-TCC ^{3'}		5'-ACg ^{3'}		5'-CgA ^{3'}	
			292	524				916			564		544			
			5'-gTA ^{3'}	5'-CAA ^{3'}				5'-gAC ^{3'}			5'-ACT ^{3'}		5'-ggT ^{3'}			
			583								565					
			5'-gTg ^{3'}								5'-CAT ^{3'}					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

INTERPRETATION TABLE															
HLA-B*39 SSP subtyping															
Amplification patterns of the B*39:01 to 39:60 alleles															
Well ⁷															
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230
			215		225			235		195	180		180		
800	800	1070	800	800	800	800	1070	1070	800	800	1070	800	800	800	800
407	142	44	246	363	142	246	103	-149	361	419	419	357	142	544	112
5'-gg 3'	5'-TCT 3'	5'-ggC 3'	5'-gAA 3'	5'-Agg 3'	5'-TCT 3'	5'-gAA 3'	5'-CCT 3'	5'-ggg 3'	5'-AgT 3'	5'-gTT 3'	5'-gTT 3'	5'-Tgg 3'	5'-TCT 3'	5'-gAg 3'	5'-CCT 3'
			368		362			419		544			527		355
			5'-gTC 3'		5'-gAC 3'			5'-gTT 3'		5'-gAA 3'			5'-TgA 3'		5'-TCA 3'
			486												365
			5'-ACg 3'											5'-CAC 3'	
544	259	259	299	544	250	292	246	44	583	563	518	559	280	3 rd	311
5'-ggT 3'	5'-CTC 3'	5'-gTT 3'	5'-TCA 3'	5'-ggT 3'	5'-CCg 3'	5'-gTC 3'	5'-TAT 3'	5'-CCg 3'	5'-gTg 3'	5'-CgA 3'	5'-CCC 3'	5'-CgT 3'	5'-gTC 3'	5'-TAT 3'	5'-ggT 3'
		259	544		544		246	527		583	559	559	544		544
		5'-gTT 3'	5'-ggT 3'		5'-ggT 3'		5'-TAT 3'	5'-CCg 3'		5'-gTg 3'	5'-CAG 3'	5'-CTC 3'	5'-ggT 3'		5'-ggT 3'
											564				
											5'-ACT 3'				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
															Well No.

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Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145 385			220	405		165			385		190	220
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HLA-B allele ⁴																
*39:01:01:01, 39:01:03, 39:01:06-39:01:08, 39:01:10-39:01:11	1	2			5											
*39:01:01:02L, 39:60 ⁵	1	2			5											
*39:01:04	1	2			5											
*39:01:05	1	2			5											
*39:01:09	1	2														
*39:02:01	1				5	6										
*39:02:02	1					6										
*39:03	1	2			5		7									
*39:04	1	2			5			8								
*39:05:01-39:05:02	1	2	3		5											
*39:06:01-39:06:02		2			5				9							
*39:07	1	2	3		5					10		12				
*39:08	1		3		5	6					11					
*39:09	1	2			5											16
*39:10, 67:01:02 ⁶	1													14		
*39:11	1	2	3		5						11					
*39:12	1	2			5										15	
*39:13:01-39:13:02	1		3			6										
*39:14	1	2			5		7									16
*39:15	1	2			5							12				
*39:16	1													14	16	
*39:17	1						7							14		
*39:18	1	2			5						11					
*39:19:01	1	2								10						
*39:19:02	1	2			5					10						
*39:20	1		3											14		
*39:22	1	2			5											
*39:23	1					6							13			
*39:24	1	2			5		7									
*39:25N	1	2			5											
*39:26	1	2		4	5											
*39:27	1	2			5								13			
*39:28	1	2			5											
*39:29	1	2			5		7					12				16
*39:30		2			5											
*39:31	1	2			5										15	
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

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Lot-specific information

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180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No. HLA-B allele ⁴	
		19		21		23	24									*39:01:01:01, 39:01:03, 39:01:06- 39:01:08, 39:01:10-39:01:11	
		19		21		23	24	25								*39:01:01:02L, 39:60 ⁵	
		19		21			24									*39:01:04	
		19	20	21		23	24									*39:01:05	
		19		21												*39:01:09	
	18			21		23	24									*39:02:01	
	18			21												*39:02:02	
		19				23	24								w	*39:03	
		19		21		23										*39:04	
		19		21			24									*39:05:01-39:05:02	
		19				23	24					29				*39:06:01-39:06:02	
		19		21			24									*39:07	
	18			21			24									*39:08	
		19	20	21		23	24									*39:09	
		19		21												*39:10, 67:01:02 ⁶	
		19		21			24									*39:11	
		19		21		23										*39:12	
	18			21												*39:13:01-39:13:02	
		19				23	24								w	*39:14	
		19		21		23	24									*39:15	
		19														*39:16	
		19		21												*39:17	
		19	20	21		23	24						30			*39:18	
		19		21												*39:19:01	
		19		21		23	24									*39:19:02	
		19		21												*39:20	
	18			21		23	24									*39:22	
	18			21												*39:23	
		19				23	24								32	*39:24	
17		19		21		23	24									*39:25N	
		19		21		23	24									*39:26	
		19	20	21		23	24									*39:27	
		19			22	23	24									*39:28	
		19				23	24								w	*39:29	
		19				23	24							31		*39:30	
		19		21		23	w									*39:31	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

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Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*39:32		2			5											
*39:33		2			5						11					
*39:34		2			5											
*39:35	1	2			5											
*39:36		2			5						11					
*39:37	1	2	3		5		7									
*39:38Q	1	2			5										15	
*39:39	1				5	6										
*39:40N	1	2			5						11					
*39:41	1	2			5											
*39:42		2			5											
*39:43		2	3		5											
*39:44	1	2			5								13			
*39:45	1	2			5											
*39:46	1	2			5			8								
*39:47		2			5			8								
*39:48	1	2			5											
*39:49	1		3			6						12				
*39:50		2			5			8								
*39:51	1	2		4	5								13			
*39:52	1				5											
*39:53	1	2			5						11					
*39:54	1				5										15	
*39:55	1	2	3		5							12				
*39:56	1	2	3		5											
*39:57		2			5				9		11					
*39:58	1			4	5											
*39:59	1	2			5				9							
*07:02:01-07:07, 07:09, 07:11- 07:12, 07:14-07:15, 07:17-07:26, 07:28-07:31, 07:33-07:35, 07:39- 07:47, 07:49N, 07:51-07:53, 07:55- 07:64, 07:66-07:68:02, 07:70- 07:74, 07:76-07:77, 07:79-07:80, 07:82, 07:86-07:90, 07:92-07:115, 42:01:01-42:02, 42:05:01-42:10, 42:12-42:14															14	
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	
		19				23	24			27	28						*39:32
		19				23	24				28						*39:33
		19				23	24					29		31			*39:34
		19		21		23	24						30				*39:35
		19				23	24										*39:36
		19					24								w		*39:37
		19		21		23	24			27							*39:38Q
		19		21		23	24										*39:39
		19		21		23	24				28						*39:40N
		19		21		23	24								32		*39:41
		19		w		23	24								32		*39:42
		19				23	24							31			*39:43
		19		21		23	24										*39:44
		19		21	22	23											*39:45
		19		21		23	24										*39:46
		19				23	24										*39:47
		19		21		23	24			27							*39:48
	18			21													*39:49
		19				23	24					29					*39:50
		19		21		23	24										*39:51
		19		21		23	24						30				*39:52
		19		21		23	24										*39:53
		19		21		23	24										*39:54
		19		21			24										*39:55
		19		21			24				28						*39:56
		19				23	24					29					*39:57
		19		21		23	24										*39:58
		19		21		23	24										*39:59
		19															*07:02:01-07:07, 07:09, 07:11-07:12, 07:14-07:15, 07:17-07:26, 07:28-07:31, 07:33-07:35, 07:39-07:47, 07:49N, 07:51-07:53, 07:55-07:64, 07:66-07:68:02, 07:70-07:74, 07:76-07:77, 07:79-07:80, 07:82, 07:86-07:90, 07:92-07:115, 42:01:01-42:02, 42:05:01-42:10, 42:12-42:14
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*07:08, 07:10, 07:32, 07:36, 07:81, 07:83, 08:01:01-08:02, 08:05, 08:07-08:08N, 08:11-08:12:03, 08:14-08:16, 08:18-08:22, 08:24, 08:26-08:37, 08:39-08:53, 08:56- 08:62																
*07:16, 07:37, 07:75, 07:91			3											14		
*07:27, 07:50			3			6										
*07:38, 08:03, 08:23			3													
*07:48, 81:02														14		
*07:54, 07:65, 15:11:01-15:11:05, 15:76, 15:101, 15:143, 15:148, 15:152, 44:90, 45:06, 54:06, 55:14, 56:03, 56:05:01-56:06, 83:01														14		
*07:69, 07:85		2														
*07:78											11			14		
*07:84, 42:04														14		
*08:04						6										
*08:09, 73:01-73:02																
*08:13, 08:25																
*08:17, 15:61						6										
*08:38																
*08:54, 15:03:01-15:03:03, 15:47, 15:54, 15:62, 15:68, 15:98, 15:103, 15:127, 15:131-15:132, 15:156, 15:158, 15:173, 37:01:01- 37:01:07, 37:03N-37:07, 37:09- 37:20, 37:23, 42:11, 48:05, 48:08, 48:15, 48:19, 52:16			3			6										
*08:55	1						7									16
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	
		19														*07:08, 07:10, 07:32, 07:36, 07:81, 07:83, 08:01-08:02, 08:05, 08:07-08:08N, 08:11-08:12:03, 08:14-08:16, 08:18-08:22, 08:24, 08:26-08:37, 08:39-08:53, 08:56- 08:62	
		19														*07:16, 07:37, 07:75, 07:91	
		19														*07:27, 07:50	
		19														*07:38, 08:03, 08:23	
		19												31		*07:48, 81:02	
																*07:54, 07:65, 15:11:01-15:11:05, 15:76, 15:101, 15:143, 15:148, 15:152, 44:90, 45:06, 54:06, 55:14, 56:03, 56:05:01-56:06, 83:01	
		19														*07:69, 07:85	
		19										29				*07:78	
		19										29				*07:84, 42:04	
		19														*08:04	
		19										29				*08:09, 73:01-73:02	
		19												31		*08:13, 08:25	
	18															*08:17, 15:61	
	18															*08:38	
		18														*08:54, 15:03:01-15:03:03, 15:47, 15:54, 15:62, 15:68, 15:98, 15:103, 15:127, 15:131-15:132, 15:156, 15:158, 15:173, 37:01:01- 37:01:07, 37:03N-37:07, 37:09- 37:20, 37:23, 42:11, 48:05, 48:08, 48:15, 48:19, 52:16	
		19													w	*08:55	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*13:01:01-13:01:05, 13:04, 13:06-13:07N, 13:10-13:13, 13:17, 13:21-13:23, 13:25-13:26, 13:28-13:29, 13:36, 13:39, 15:05:01-15:05:02, 15:20, 15:31, 15:55, 15:86, 15:107, 15:155, 15:188, 27:01-27:03, 27:05:02-27:05:14, 27:07-27:09, 27:11-27:13, 27:16-27:17, 27:19, 27:23, 27:26-27:39, 27:41-27:44, 27:46, 27:48-27:53, 27:55-27:62, 27:64N-27:65N, 27:67, 35:01:01:01-35:02:04, 35:04:01-35:05:02, 35:07, 35:09:01-35:10, 35:12:01-35:12:02, 35:15-35:17, 35:19-35:20:02, 35:22-35:23, 35:27-35:34, 35:37, 35:39-35:42:02, 35:46-35:54, 35:57, 35:63-35:65Q, 35:68:01-35:69, 35:71-35:72, 35:77-35:78, 35:81, 35:83, 35:88-35:95, 35:97, 35:101:01-35:101:02, 35:103-35:104, 35:107-35:108:02, 35:110-35:114, 35:116, 35:119-35:123, 35:126, 35:129N-35:134N, 35:137-35:140, 35:143-35:145N, 40:01:01-40:01:11, 40:02:01-40:04, 40:07-40:11:02, 40:13-40:14:03, 40:18-40:22N, 40:24, 40:27, 40:29-40:31, 40:33-40:35, 40:37-40:40, 40:42-40:43, 40:45-40:50, 40:52, 40:54-40:60, 40:62-40:67, 40:69, 40:72:01-40:74, 40:76, 40:78-40:82, 40:84-40:85, 40:87-40:92, 40:94, 40:97, 40:99-40:102, 40:104-40:105, 40:107-40:108, 40:111-40:115, 40:117-40:126, 40:129-40:130, 40:132-40:135, 40:137-40:147, 44:03:01-44:03:11, 44:07, 44:13, 44:26, 44:30-44:32, 44:36-44:40, 44:43, 44:45-44:47, 44:50, 44:54, 44:57, 44:60-44:61N, 44:64:01-44:65, 44:69, 44:77, 44:81-44:82, 44:85, 44:92, 44:94, 44:96, 44:98, 44:103, 44:105, 44:107-44:110, 46:06, 46:13:01-46:13:03, 46:21, 47:01:01:01-47:07, 48:02:02, 51:09:01-51:09:02, 51:40, 51:42, 51:73, 51:81, 51:91, 52:03, 52:10, 53:01:01-53:01:05, 53:03, 53:05, 53:07, 53:09-53:10, 53:12-53:15, 53:17-53:21, 53:23, 57:01:01-57:01:08, 57:03:01-57:03:02, 57:06-57:08, 57:10-57:11, 57:15-57:18, 57:20-57:21, 57:23, 57:25-57:26, 57:29, 57:31-57:32, 58:01:01-58:02, 58:04, 58:07, 58:10N-58:11, 58:13-58:18, 58:21, 58:23-58:30, 78:04, 81:05																
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

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Lot No.: 47K																Lot-specific information				www.olerup-ssp.com				Length of spec. PCR product(s)	
180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230										
			215		225				235		195	180		180											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.									
														31		*13:01:01-13:01:05, 13:04, 13:06-13:07N, 13:10-13:13, 13:17, 13:21-13:23, 13:25-13:26, 13:28-13:29, 13:36, 13:39, 15:05:01-15:05:02, 15:20, 15:31, 15:55, 15:86, 15:107, 15:155, 15:188, 27:01-27:03, 27:05:02-27:05:14, 27:07-27:09, 27:11-27:13, 27:16-27:17, 27:19, 27:23, 27:26-27:39, 27:41-27:44, 27:46, 27:48-27:53, 27:55-27:62, 27:64N-27:65N, 27:67, 35:01:01:01-35:02:04, 35:04:01-35:05:02, 35:07, 35:09:01-35:10, 35:12:01-35:12:02, 35:15-35:17, 35:19-35:20:02, 35:22-35:23, 35:27-35:34, 35:37, 35:39-35:42:02, 35:46-35:54, 35:57, 35:63-35:65Q, 35:68:01-35:69, 35:71-35:72, 35:77-35:78, 35:81, 35:83, 35:88-35:95, 35:97, 35:101:01-35:101:02, 35:103-35:104, 35:107-35:108:02, 35:110-35:114, 35:116, 35:119-35:123, 35:126, 35:129N-35:134N, 35:137-35:140, 35:143-35:145N, 40:01:01-40:01:11, 40:02:01-40:04, 40:07-40:11:02, 40:13-40:14:03, 40:18-40:22N, 40:24, 40:27, 40:29-40:31, 40:33-40:35, 40:37-40:40, 40:42-40:43, 40:45-40:50, 40:52, 40:54-40:60, 40:62-40:67, 40:69, 40:72:01-40:74, 40:76, 40:78-40:82, 40:84-40:85, 40:87-40:92, 40:94, 40:97, 40:99-40:102, 40:104-40:105, 40:107-40:108, 40:111-40:115, 40:117-40:126, 40:129-40:130, 40:132-40:135, 40:137-40:147, 44:03:01-44:03:11, 44:07, 44:13, 44:26, 44:30-44:32, 44:36-44:40, 44:43, 44:45-44:47, 44:50, 44:54, 44:57, 44:60-44:61N, 44:64:01-44:65, 44:69, 44:77, 44:81-44:82, 44:85, 44:92, 44:94, 44:96, 44:98, 44:103, 44:105, 44:107-44:110, 46:06, 46:13:01-46:13:03, 46:21, 47:01:01:01-47:07, 48:02:02, 51:09:01-51:09:02, 51:40, 51:42, 51:73, 51:81, 51:91, 52:03, 52:10, 53:01:01-53:01:05, 53:03, 53:05, 53:07, 53:09-53:10, 53:12-53:15, 53:17-53:21, 53:23, 57:01:01-57:01:08, 57:03:01-57:03:02, 57:06-57:08, 57:10-57:11, 57:15-57:18, 57:20-57:21, 57:23, 57:25-57:26, 57:29, 57:31-57:32, 58:01:01-58:02, 58:04, 58:07, 58:10N-58:11, 58:13-58:18, 58:21, 58:23-58:30, 78:04, 81:05									
														31		40:42-40:43, 40:45-40:50, 40:52, 40:54-40:60, 40:62-40:67, 40:69, 40:72:01-40:74, 40:76, 40:78-40:82, 40:84-40:85, 40:87-40:92, 40:94, 40:97, 40:99-40:102, 40:104-40:105, 40:107-40:108, 40:111-40:115, 40:117-40:126, 40:129-40:130, 40:132-40:135, 40:137-40:147, 44:03:01-44:03:11, 44:07, 44:13, 44:26, 44:30-44:32, 44:36-44:40, 44:43, 44:45-44:47, 44:50, 44:54, 44:57, 44:60-44:61N, 44:64:01-44:65, 44:69, 44:77, 44:81-44:82, 44:85, 44:92, 44:94, 44:96, 44:98, 44:103, 44:105, 44:107-44:110, 46:06, 46:13:01-46:13:03, 46:21, 47:01:01:01-47:07, 48:02:02, 51:09:01-51:09:02, 51:40, 51:42, 51:73, 51:81, 51:91, 52:03, 52:10, 53:01:01-53:01:05, 53:03, 53:05, 53:07, 53:09-53:10, 53:12-53:15, 53:17-53:21, 53:23, 57:01:01-57:01:08, 57:03:01-57:03:02, 57:06-57:08, 57:10-57:11, 57:15-57:18, 57:20-57:21, 57:23, 57:25-57:26, 57:29, 57:31-57:32, 58:01:01-58:02, 58:04, 58:07, 58:10N-58:11, 58:13-58:18, 58:21, 58:23-58:30, 78:04, 81:05									
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.									

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*13:02:01-13:02:09, 13:08Q- 13:09, 13:14, 13:19, 13:27, 13:30, 13:32-13:35, 13:37-13:38, 27:14, 35:60, 40:06:01:01-40:06:03, 40:44, 40:53, 40:70, 40:75, 40:83, 40:93, 40:96, 40:103, 40:109- 40:110, 40:127, 40:131, 46:18, 51:10, 51:31, 51:93, 54:12, 55:18, 55:34, 59:01-59:03, 59:05																
*13:03, 35:03:01-35:03:04, 35:06, 35:13, 35:36, 35:55-35:56, 35:59, 35:70, 35:74-35:75, 35:84, 35:98, 35:106, 35:127-35:128, 35:136, 40:71, 44:10, 46:11, 51:15, 53:04, 56:07-56:08, 56:14, 59:04																
*13:15																
*13:16, 15:42, 15:83, 40:95, 41:01, 41:05-41:07, 41:09, 41:12, 45:08, 45:10, 49:07, 51:16, 51:21, 51:34, 51:36, 51:82, 52:08, 78:07																
*13:18, 13:31											11					
*14:01, 14:07N, 14:12		2			5											
*14:02:01-14:02:02, 14:02:04, 14:03, 14:09, 14:11, 14:15-14:17		2			5											
*14:02:03		2														
*14:02:05		2														
*14:04		2			5											
*14:05-14:06:02, 14:13		2			5											
*14:08, 14:10		2			5											
*14:14		2	3		5											
*14:18		2	3		5											
*15:09-15:10:02, 15:18:01- 15:18:04, 15:23, 15:37, 15:51, 15:72, 15:80, 15:90, 15:93, 15:99, 15:108, 15:115, 15:119, 15:134, 15:153, 15:161, 15:176, 15:197- 15:198, 15:200			2	3												
*15:29, 15:38:01-15:38:02, 35:21, 35:142, 51:37, 51:45, 51:63, 53:06				3												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	
												29		31		*13:02:01-13:02:09, 13:08Q-13:09, 13:14, 13:19, 13:27, 13:30, 13:32-13:35, 13:37-13:38, 27:14, 35:60, 40:06:01:01-40:06:03, 40:44, 40:53, 40:70, 40:75, 40:83, 40:93, 40:96, 40:103, 40:109-40:110, 40:127, 40:131, 46:18, 51:10, 51:31, 51:93, 54:12, 55:18, 55:34, 59:01-59:03, 59:05	
											28			31		*13:03, 35:03:01-35:03:04, 35:06, 35:13, 35:36, 35:55-35:56, 35:59, 35:70, 35:74-35:75, 35:84, 35:98, 35:106, 35:127-35:128, 35:136, 40:71, 44:10, 46:11, 51:15, 53:04, 56:07-56:08, 56:14, 59:04	
										27		29		31		*13:15	
												29				*13:16, 15:42, 15:83, 40:95, 41:01, 41:05-41:07, 41:09, 41:12, 45:08, 45:10, 49:07, 51:16, 51:21, 51:34, 51:36, 51:82, 52:08, 78:07	
												29				*13:18, 13:31	
		19				23	24		26							*14:01, 14:07N, 14:12	
		19				23			26							*14:02:01-14:02:02, 14:02:04, 14:03, 14:09, 14:11, 14:15-14:17	
		19							26							*14:02:03	
		19				23			26							*14:02:05	
						23			26							*14:04	
		19				23										*14:05-14:06:02, 14:13	
		19				23	24									*14:08, 14:10	
		19					24		26							*14:14	
		19							26							*14:18	
																*15:09-15:10:02, 15:18:01-15:18:04, 15:23, 15:37, 15:51, 15:72, 15:80, 15:90, 15:93, 15:99, 15:108, 15:115, 15:119, 15:134, 15:153, 15:161, 15:176, 15:197-15:198, 15:200	
																*15:29, 15:38:01-15:38:02, 35:21, 35:142, 51:37, 51:45, 51:63, 53:06	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*15:49, 15:74, 37:21			3													
*15:52, 15:114, 15:124		2	3													
*15:58, 15:73											11					
*15:64, 18:13, 18:15, 18:19, 18:21, 18:30, 37:08			3			6										
*15:69	1		3			6				10		12				
*15:91, 15:123, 15:151, 18:12, 37:02, 40:12, 48:01:01-48:02:01, 48:03:01-48:04, 48:09-48:14, 48:17-48:18, 48:20-48:23			3			6										
*15:133		2	3													
*15:185, 18:04, 18:07:01- 18:07:02, 18:29, 35:24:01-35:25, 35:124-35:125, 53:02, 57:14, 58:09, 58:12			3													
*15:186	1	2	3							10		12				
*15:189					5			8								
*18:01:01-18:03, 18:05-18:06, 18:08-18:11, 18:14, 18:17N-18:18, 18:20, 18:22-18:28, 18:31-18:32, 18:34-18:43, 18:45-18:50, 48:16			3			6										
*18:33		2	3							10						
*18:44			3			6										
*35:26					5			8								
*35:35										10		12				
*35:38, C*15:15																
*35:76, 40:61, 54:09, 55:04, 55:08, 56:09-56:10, 56:12, 56:15, 56:18, 81:01, 81:03-81:04N														14		
*35:82										10						
*35:85										10						
*35:96, 51:19																
*35:109																
*35:135, 51:22, 78:03										10						
*38:01:01-38:01:02, 38:01:04- 38:02:02, 38:09, 38:11-38:12, 38:17-38:18, 38:21	1	2	3													
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	
	18													31			*15:49, 15:74, 37:21
																	*15:52, 15:114, 15:124
											28						*15:58, 15:73
																	*15:64, 18:13, 18:15, 18:19, 18:21, 18:30, 37:08
	18		20	21									30				*15:69
														31			*15:91, 15:123, 15:151, 18:12, 37:02, 40:12, 48:01:01-48:02:01, 48:03:01-48:04, 48:09-48:14, 48:17-48:18, 48:20-48:23
											28						*15:133
														31			*15:185, 18:04, 18:07:01- 18:07:02, 18:29, 35:24:01-35:25, 35:124-35:125, 53:02, 57:14, 58:09, 58:12
			20	21													*15:186
						23											*15:189
														31			*18:01:01-18:03, 18:05-18:06, 18:08-18:11, 18:14, 18:17N-18:18, 18:20, 18:22-18:28, 18:31-18:32, 18:34-18:43, 18:45-18:50, 48:16
														31			*18:33
									26					31			*18:44
														31			*35:26
															32		*35:35
											28						*35:38, C*15:15
														31			*35:76, 40:61, 54:09, 55:04, 55:08, 56:09-56:10, 56:12, 56:15, 56:18, 81:01, 81:03-81:04N
														31			*35:82
											28			31			*35:85
										27							*35:96, 51:19
										27	28			31			*35:109
																	*35:135, 51:22, 78:03
		19		21			24										*38:01:01-38:01:02, 38:01:04- 38:02:02, 38:09, 38:11-38:12, 38:17-38:18, 38:21
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*38:01:03	1	2	3													
*38:03	1					6										
*38:04	1	2	3													
*38:05	1	2	3													
*38:06	1		3													
*38:07	1		3													
*38:08		2	3													
*38:10, 38:23		2	3													
*38:13	1	2														
*38:14	1	2														
*38:15		2	3													
*38:16	1															
*38:19	1	2	3				7									
*38:20		2	3													
*38:22	1	2	3													
*40:25, 40:68, 40:106																
*40:36, 40:77								8								
*40:86								8								
*48:06			3													
*48:07			3			6	8									
*51:13:01-51:13:02, 51:62, 51:92, 52:14																
*54:01-54:02, 54:04-54:05N, 54:07-54:08N, 54:11, 54:13-54:19, 54:21-54:23, 55:02:01-55:02:06, 55:07, 55:10, 55:12-55:13, 55:16, 55:19, 55:22-55:23, 55:26-55:27, 55:30, 55:32, 55:35, 55:39, 55:41-55:43, 56:23															14	
*54:03, 56:01:01-56:02, 56:04, 56:11, 56:16-56:17, 56:20, 56:22, 56:24, 56:26-56:29																14
*54:10, 54:20, 55:09, 55:21, 55:37												11			14	
*55:01:01-55:01:06, 55:03, 55:05, 55:11, 55:15, 55:17, 55:20, 55:24-55:25, 55:28-55:29, 55:31, 55:33, 55:36, 55:38, 55:40																14
*56:13, 56:25, 82:01-82:03																14
*56:19N												11				14
*58:20, 67:02	1															
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)	
			215		225			235		195	180		180				
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	
		19	20	21			24										*38:01:03
	18			21			24										*38:03
	18			21													*38:04
		19		21													*38:05
		19		21													*38:06
		19		21			24										*38:07
		19		w			24										*38:08
		19					24										*38:10, 38:23
		19		21			24										*38:13
		19		21		w	24										*38:14
		19		21			24										*38:15
		19		21			24										*38:16
		19					24							w			*38:19
		19					24							32			*38:20
		19					24										*38:22
		?												31			*40:25, 40:68, 40:106
														31			*40:36, 40:77
												29		31			*40:86
		19												31			*48:06
	18													31			*48:07
										27	28						*51:13:01-51:13:02, 51:62, 51:92, 52:14
													29	31			*54:01-54:02, 54:04-54:05N, 54:07- 54:08N, 54:11, 54:13-54:19, 54:21- 54:23, 55:02:01-55:02:06, 55:07, 55:10, 55:12-55:13, 55:16, 55:19, 55:22-55:23, 55:26-55:27, 55:30, 55:32, 55:35, 55:39, 55:41-55:43, 56:23
										28				31			*54:03, 56:01:01-56:02, 56:04, 56:11, 56:16-56:17, 56:20, 56:22, 56:24, 56:26-56:29
												29					*54:10, 54:20, 55:09, 55:21, 55:37
												29					*55:01:01-55:01:06, 55:03, 55:05, 55:11, 55:15, 55:17, 55:20, 55:24- 55:25, 55:28-55:29, 55:31, 55:33, 55:36, 55:38, 55:40
										28							*56:13, 56:25, 82:01-82:03
										28				31			*56:19N
				21													*58:20, 67:02
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.	

Length of spec.	230	170	200	65	105	170	165	180	220	105	170	175	85	80	145	165
PCR product(s)				145			220	405		165			385		190	220
				385												
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*67:01:01	1				5									14		
C*01:30																
C*06:40	1															
C*07:137	1															16
C*15:31																
HLA-B allele ⁴																
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most wells, or a band of 800 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-B*39 subtyping.

In addition, wells number 3, 5, 6, 9, 10, 12, 13, 15 to 18, 20 to 23, 26, 27 and 29 to 32 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

In the presence of a specific amplification the intensity of the control band often decreases.

²The nucleotide position, in the 1st, 2nd, 3rd or 4th exon 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, in the 1st, 2nd, 3rd or 4th exon or 3rd intron 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.

⁴The nucleotide sequence of the B*390102 allele has been shown to be identical B*39:01:01:01.

The nucleotide sequence of the B*3921 allele has been shown to be identical B*39:24.

⁵The B*39:01:01:02L and B*39:60 alleles can be distinguished by the different sizes of the specific PCR products generated by primer mix 25.

⁶The B*39:10 and B*67:01:02 alleles will give rise to identical amplification patterns with the HLA-B*39 subtyping kit. These two alleles can be distinguished by the HLA-B low resolution and/or HLA-B*67 kits.

180	160	385	100	220	150	85	185	150	265	70	140	245	60	155	230	Length of spec. PCR product(s)
		215		225				235		195	180		180			
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
		19		21		23	24									*67:01:01
									26							C*01:30
													30			C*06:40
			20	21												C*07:137
								25								C*15:31
																HLA-B allele ⁴
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

⁷Primer mix 4: Specific PCR fragment of 65 bp in the B*39:58 allele. Specific PCR fragment of 145 bp in the B*39:26 allele. Specific PCR fragment of 385 bp in the B*39:51 allele.

Primer solution 7: Specific PCR fragment of 165 bp in the B*39:17 allele. Specific PCR fragment of 220 bp in the B*39:03, 39:14, 39:24, 39:29 and 39:37 and in the B*08:55 and 38:19 alleles.

Primer solution 8: Specific PCR fragment of 180 bp in the B*39:04, 39:47 and 39:50 and in the B*15:189, 35:26, 40:36, 40:77, 40:86 and 48:07 alleles. Specific PCR fragment of 405 bp in the B*39:46 allele.

Primer solution 10: Specific PCR fragment of 105 bp in the B*39:19:01-39:19:02 and in the B*18:33, 35:82, 35:85, 35:135, 51:22 and 78:03 alleles. Specific PCR fragment of 165 bp in the B*39:07 and in the B*15:69, 15:186 and 35:35 alleles.

Primer mix 13: Specific PCR fragment of 85 bp in the B*39:23, 39:27 and 39:44 alleles. Specific PCR fragment of 385 bp in the B*39:51 allele.

Primer mix 15: Specific PCR fragment of 145 bp in the B*39:54 allele. Specific PCR fragments of 190 bp in the B*39:12, 39:31 and 39:38Q alleles.

Primer solution 16: Specific PCR fragment of 165 bp in the B*39:14 and 39:29 and in the B*08:55 alleles. Specific PCR fragment of 220 bp in the B*39:09 and 39:16 and in the C*07:137 alleles.

Primer solution 20: Specific PCR fragment of 100 bp in the B*39:01:05, 39:18 and 39:27 and in the B*15:69, 15:186 and 38:01:03 alleles. Specific PCR fragment of 215 bp in the B*39:09 and in the C*07:137 alleles.

Primer solution 22: Specific PCR fragment of 150 bp in the B*39:45 allele. Specific PCR fragment of 225 bp in the B*39:28 allele.

Primer solution 25: Specific PCR fragment of 150 bp in the B*39:60 and in the C*15:31 alleles. Specific PCR fragment of 235 bp in the B*39:01:01:02L allele.

Primer mix 27: Specific PCR fragment of 70 bp in the B*39:48 and in the B*13:15, 35:96, 51:13:01-51:13:02, 51:19, 51:62, 51:92 and 52:14 alleles. Specific PCR fragment of 195 bp in the B*39:38Q and 39:48 alleles. Specific PCR fragments of 70 and 195 bp in the B*39:32 and in the B*35:109 alleles

Primer mix 28: Specific PCR fragment of 140 bp in the B*39:56 allele. Specific PCR fragment of 180 bp in the B*39:32-39:33 and 39:40N and in the B*13:03, 15:58, 15:73, 15:133, 35:03:01-35:03:04, 35:06, 35:13, 35:36, 35:38, 35:55-35:56, 35:59, 35:70, 35:74-35:75, 35:84-35:85, 35:98, 35:106, 35:109, 35:127-35:128, 35:136, 40:71, 44:10, 46:11, 51:13:01-51:13:02, 51:15, 51:62, 51:92, 52:14, 53:04, 54:03, 56:01:01-56:02, 56:04, 56:07-56:08, 56:11, 56:13-56:14, 56:16-56:17, 56:19N-56:20, 56:22, 56:24-56:29, 59:04 and 82:01-82:03 and in the C*15:15 alleles.

Primer mix 30: Specific PCR fragment of 60 bp in the B*39:18 and 39:35 and in the B*15:69 and in the C*06:40 alleles. Specific PCR fragment of 180 bp in the B*39:52 allele.

‘w’, might be weakly amplified.

‘?’ , nucleotide sequence information not available for the primer matching sequence.

				Well																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
				Prod. No.:	200967401	200967402	200967403	201076304	200967405	200967406	200967407	201076308	201076309	200967410	200967411	200967412	201076313	200967414	201076315	200967416	
IHC cell line		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	9025 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-B*39 SSP subtyping kit																					
				Prod. No.:	Well																
					17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
					200967417	200967418	200967419	201076320	200967421	201076322	200967423	201076324	201076325	200967426	200967427	201076328	200967429	200967430	200967431	200967432	
	IHWC cell line	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	9025 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		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-

CERTIFICATE OF ANALYSIS**Olerup SSP® HLA-B*39 SSP**Product number: 101.566-12u/04u – without *Taq* pol.

Lot number: 47K

Expiry date: 2013-April-01

Number of tests: 12 tests – Product No. 101.566-12u

4 tests – Product No. 101.566-04u

Number of wells per test: 32

Well specifications:

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2009-674-01	13	2010-763-13	25	2010-763-25
2	2009-674-02	14	2009-674-14	26	2009-674-26
3	2009-674-03	15	2010-763-15	27	2009-674-27
4	2010-763-04	16	2009-674-16	28	2010-763-28
5	2009-674-05	17	2009-674-17	29	2009-674-29
6	2009-674-06	18	2009-674-18	30	2009-674-30
7	2009-674-07	19	2009-674-19	31	2009-674-31
8	2010-763-08	20	2010-763-20	32	2009-674-32
9	2010-763-09	21	2009-674-21		
10	2009-674-10	22	2010-763-22		
11	2009-674-11	23	2009-674-23		
12	2009-674-12	24	2010-763-24		

The specificity of each primer solution of the kit has been tested against 48 well characterized IHWC cell line DNAs.

No DNAs carrying the alleles to be amplified by primer solutions 4, 7, 10, 13, 15, 22, 25, 27, 30 and 32 were available. The specificities of the primers in primer solutions 4, 7, 10, 13, 15, 22, 25, 27, 30 and 32 were tested by separately adding one or two additional 5'-primers, respectively one or two additional 3'-primers. One or two 5'-primers in primer solutions 1, 5, 8, 13, 15, 16, 22, 25 and 32 were not possible to test. One or two 3'-primers in primer solutions 4, 9, 11, 13, 15, 22, 27, 28 and 30 were not possible to test.

Additional primers in primer solutions 3, 8, 9, 16 and 20 were tested by separately adding either 5'- or 3'-primers.

Results: No false positive or false negative amplifications were obtained.

Date of approval: 2011-March-17

Approved by:

Quality Control, Supervisor

Lot No.: **47K**

Lot-specific information

www.olerup-ssp.com

Declaration of Conformity

Product name: *Olerup* SSP® HLA-B*39**Product number:** 101.566-12u/04u**Lot number:** 47K**Intended use:** HLA-B*39 histocompatibility testing**Manufacturer:** *Olerup* SSP AB
Hasselstigen 1
SE-133 33 Saltsjöbaden, Sweden
Phone: +46-8-717 88 27
Fax: +46-8-717 88 18

We, *Olerup* SSP AB, hereby declare that this product, to which this Declaration of Conformity relates is in conformity with the following Standard(s) and other normative document(s) ISO 9001:2008 and ISO 13485:2003, following the provisions of the 98/79/EC Directive on *in vitro* diagnostic medical devices, Annex II List B, conformity assessed using Annex IV, as transposed into the national laws of the Member States of the European Union.

The Technical Documentation File is maintained at *Olerup* SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

The Authorized Representative located within the Community is: *Olerup* SSP AB.

Notified Body: Lloyd's Register Quality Assurance Limited, Hiramford, Middlemarch Office Village, Siskin Drive, Coventry CV3 4FJ, United Kingdom. (Notified Body number: 0088.)

Saltsjöbaden, Sweden
2011-March-17

Olle Olerup
Managing Director

Lot No.: **47K**

Lot-specific information

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