DQB1 high resolution for frequent alleles

(101.221-12/12u) Lot No: 7R9 Expiry Date: 2027-02-01

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sample ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA Conc.(ng/ul):\_\_\_\_\_\_\_\_\_

Test Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tested By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Review Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reviewed By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Interpretation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Failed lanes*: \_\_\_\_\_\_\_\_\_\_\_\_ *Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Gel Picture**

|  |
| --- |
| PHOTO DOCUMENT |

Abbreviations

ICB: Internal Control Band

AmpS: Amplicon Size

**Notes:**

Product sizes are approximate. For detailed information, see the lot-specific Specificity Table and Interpretation Table.

This table is intended as a guide. For interpretation always use the Interpretation Table and/or Specificity Table.

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

Primer mixes 21, 26, 30, 37, 47, 55, 57, 59, 62, 72 and 81 may give rise to a lower yield of HLA-specific PCR product than the other DQB1 primer mixes, most pronounced for primer mix 55.

Primer mixes 3, 8, 13, 17, 18, 30, 35, 38, 41, 42, 43, 49, 64 and 71 have a tendency to giving rise to primer oligomer formation.

Primer mixes 2, 10, 12, 18, 20, 21, 31, 33, 35, 36, 39, 40, 42, 43, 51, 61, 64, 75, 79, 80 and 94 may have tendencies of unspecific amplifications, most pronounced for primer mix 75.

Primer mix 20 may give rise to a long unspecific amplification product. This band should be disregarded when interpreting the typing results.

Primer mix 96 contains a negative control, which will amplify the majority of HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 200 base pairs.









































**1**DQB1 alleles in bold lettering are listed as confirmed alleles on the IMGT/HLA web page [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla), release 3.27.0, January 2017.

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The following DQB1 high primer mixes have two or more product sizes:

|  |  |  |
| --- | --- | --- |
| Primer Mix | Size of spec. PCR product | Amplified DQB1alleles |
|  **4** | 140 bp 185 bp | \*02:02:01:01-02:02:23, 02:05?, 02:06, 02:10-02:12, 02:13?, 02:15?-02:19?, 02:20:01:01N-02:20:01:02N, 02:21?-02:25?, 02:26, 02:28?-02:47?, 02:49?, 02:50, 02:51?-02:52?, 02:54?-02:56?, 02:58N?, 02:60?-02:61?, 02:62, 02:64-02:65, 02:66?-02:70?, 02:71, 02:73?-02:78?, 02:80, 02:84, 02:89:01-02:89:02, 02:95, 02:97, 02:110, 02:113, 02:116-02:117, 02:120-02:122, 02:124, 02:126-02:127, 02:131, 02:137-02:138, 02:141-02:147, 02:150, 02:153, 02:156, 02:161-02:162N, 02:165, 02:167N, 02:169, 02:171Q-02:172, 02:175-02:176N, 02:179-02:180, 02:183N, 02:187, 02:194N, 02:199-02:201, 02:203-02:204N, 02:206N-02:207, 02:210-02:211\*03:28, 03:50 |
|  **5** | 155 bp 180 bp210 bp260 bp | \*02:04, 02:108, 02:144, 03:22:01:01-03:22:02, 03:96, 03:251, 04:23, 05:103w, 05:226, 05:231w, 06:04:01:01w-06:04:15w, 06:04:17w-06:05:02w, 06:06?, 06:07:01w-06:07:02w, 06:08:02?-06:08:03?, 06:09:01:01w-06:09:12w, 06:11:02?-06:11:03?, 06:12w, 06:13:02?-06:13:03?, 06:15:01?, 06:17?-06:18:01?, 06:18:02w, 06:19:01?, 06:21w, 06:22:01?-06:25?, 06:27:02?, 06:29?-06:32:02?, 06:34w, 06:35?, 06:36w, 06:38w, 06:40?, 06:41:01:01w-06:42w, 06:45?, 06:50?, 06:51:02?, 06:52w, 06:53:01?-06:54N?, 06:56?-06:57:01?, 06:58w, 06:59?-06:61?, 06:63?-06:67?, 06:69:01?-06:72?, 06:76?, 06:79:02?-06:83?, 06:84:01:01w-06:84:01:02w, 06:85?, 06:89?, 06:91?, 06:93?-06:97?, 06:118:01w, 06:118:02?-06:118:03?, 06:118:04w, 06:119?-06:121?, 06:123?-06:124?, 06:126?, 06:128?, 06:129w, 06:131?-06:141?, 06:142w, 06:143?-06:145:01?, 06:146:01?-06:147?, 06:149?-06:153:01?, 06:154?-06:163?, 06:164w, 06:165?-06:170?, 06:171w, 06:172?-06:184?, 06:186w, 06:189w, 06:190:01?-06:199?, 06:201?-06:204?, 06:206:01?, 06:206:02w, 06:207?-06:208:01?, 06:210?-06:215?, 06:217w, 06:229?-06:236?, 06:238?, 06:241?, 06:244?, 06:246?-06:247?, 06:249?, 06:252N?, 06:254w, 06:260?, 06:261w, 06:263?, 06:265w-06:267w, 06:268?, 06:275w, 06:277?, 06:280w-06:283w, 06:287w-06:288w, 06:291w-06:292w, 06:299w, 06:301w, 06:303Nw, 06:313w, 06:318w-06:319:02w, 06:320?, 06:325w, 06:332w, 06:339w, 06:343w, 06:348w-06:349w, 06:351w, 06:353w, 06:358w, 06:361w, 06:369w, 06:371?, 06:374?, 06:375w, 06:378?-06:379N?, 06:381w, 06:385w-06:386w, 06:389?, 06:393?, 06:398w, 06:407w, 06:414Nw, 06:420w-06:421w, 06:423N?, 06:426w, 06:429w, 06:432w, 06:434w, 06:439Qw-06:441w, 06:444w, 06:449w, 06:452Nw, 06:458Nw, 06:462?-06:464?, 06:465w\*05:06:01-05:06:02, 05:07, 05:50\*05:106\*05:03:02, 05:51, 05:119, 05:125, 06:06?, 06:129, 06:146:01, 06:241 |
|  **8** | 135 bp225 bp | \*02:01:01:01-02:01:09, 02:01:11-02:01:13, 02:01:15-02:01:27, 02:01:29-02:01:37, 02:01:39-02:02:10, 02:02:12-02:02:23, 02:04-02:16, 02:18N-02:36, 02:38-02:76, 02:78-02:94, 02:96N-02:115, 02:117-02:146, 02:148-02:171Q, 02:173-02:179, 02:182-02:187, 02:189-02:211, 03:02:01:01-03:02:37, 03:07-03:08, 03:11, 03:18, 03:32, 03:37, 03:45:01-03:45:02, 03:62-03:64, 03:66N-03:68, 03:70, 03:81, 03:85, 03:106-03:107, 03:125, 03:146, 03:153, 03:161, 03:174-03:175, 03:178-03:179, 03:184-03:185, 03:189-03:190, 03:199, 03:203-03:205, 03:210-03:211, 03:213N-03:215, 03:220-03:221, 03:223-03:225, 03:228-03:229, 03:233, 03:237N, 03:240, 03:245, 03:247, 03:251, 03:261, 03:263:01:01-03:263:01:02, 03:265, 03:269N, 03:273-03:274, 03:277-03:279, 03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:308, 03:310N, 03:315, 03:320-03:324, 03:333-03:334N, 03:339N, 03:343-03:345, 03:348-03:349, 03:352, 03:362, 03:364, 03:367-03:369, 03:371, 03:379, 03:383, 03:386, 03:388, 03:392, 03:403N, 03:409-03:410, 03:412-03:413, 03:415-03:416, 03:422N, 03:429, 03:433, 03:437, 03:440N-03:442, 03:444, 03:446-03:447, 03:450, 03:452, 03:456-03:457, 03:459, 03:462-03:464, 03:466, 03:471, 03:479, 03:481, 03:484, 03:490, 03:493, 03:495, 03:498, 03:500-03:502, 03:504, 06:03:13, 06:29, 06:63, 06:123, 06:139, 06:320, 06:337\*06:171 |
|  **9** | 175 bp 220 bp | \*03:02:01:01-03:02:33, 03:02:35-03:03:29, 03:05:01-03:05:05, 03:06?-03:07?, 03:08, 03:11, 03:14:01?-03:15?, 03:17:01?-03:18?, 03:19:01:01-03:19:06, 03:20?, 03:23:01?, 03:23:02, 03:23:03?, 03:25:01, 03:25:02?-03:26?, 03:30-03:32, 03:33?-03:34?, 03:37-03:41, 03:43, 03:45:01-03:45:02, 03:48?, 03:52?-03:54?, 03:56?-03:67?, 03:68, 03:69?-03:70?, 03:71-03:72, 03:74?-03:78?, 03:79, 03:81?-03:82?, 03:85-03:91Q, 03:95N-03:100, 03:101?-03:104?, 03:105, 03:106?-03:112?, 03:117, 03:118N?, 03:120?-03:125?, 03:126, 03:127?-03:131?, 03:132, 03:133?-03:135?, 03:136, 03:137?, 03:138, 03:140?-03:149?, 03:150, 03:152?-03:163?, 03:165?-03:167?, 03:168, 03:170?-03:171?, 03:173?-03:179?, 03:180-03:181, 03:183?, 03:184, 03:185?, 03:187, 03:188?-03:189?, 03:190, 03:192?-03:194?, 03:195, 03:199-03:200, 03:201?-03:205?, 03:207?-03:210?, 03:211, 03:212?-03:214?, 03:215, 03:216?-03:221?, 03:222, 03:223?-03:228?, 03:229, 03:230?, 03:232?-03:238?, 03:239, 03:240?, 03:244?, 03:245, 03:247-03:248, 03:250-03:251, 03:255?-03:262?, 03:263:01:01-03:263:01:02, 03:265, 03:267?-03:270?, 03:272, 03:273?-03:275?, 03:277, 03:278?, 03:279-03:280, 03:282N-03:283, 03:286-03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:304, 03:308, 03:310N, 03:313, 03:315-03:316, 03:319-03:324, 03:332-03:337, 03:339N, 03:343-03:346, 03:348-03:349, 03:351?-03:353?, 03:356N?, 03:357N, 03:359?, 03:362-03:365, 03:367-03:369, 03:371, 03:374-03:376N, 03:379, 03:381-03:384, 03:386, 03:387?, 03:388, 03:392-03:395, 03:398, 03:401-03:403N, 03:405-03:406, 03:409-03:416, 03:422N, 03:425?, 03:429, 03:433, 03:437?-03:438?, 03:440N, 03:441?, 03:442, 03:444-03:447, 03:449?-03:450?, 03:452-03:453, 03:455?-03:456?, 03:457, 03:459, 03:461-03:464, 03:466, 03:471, 03:474, 03:477-03:479, 03:484-03:485, 03:487, 03:489-03:490, 03:492?, 03:493-03:495, 03:498, 03:500-03:502, 03:504-03:505, 03:507, 03:509N, 04:01:01:01-04:02:01:01, 04:02:01:04-04:44, 04:46N-04:95\*02:01:01:01-02:01:09, 02:01:11-02:01:13, 02:01:15-02:01:27, 02:01:29-02:36, 02:38-02:94, 02:96N-02:115, 02:117-02:146, 02:148-02:171Q, 02:173-02:180, 02:182-02:211, 03:02:01:01-03:03:15, 03:03:17-03:03:29, 03:06-03:08, 03:11-03:12, 03:15, 03:18, 03:20, 03:23:01-03:23:03, 03:25:01-03:26, 03:30-03:34, 03:37-03:41, 03:43, 03:45:01-03:45:02, 03:62-03:68, 03:70, 03:74, 03:79, 03:81, 03:85-03:91Q, 03:95N-03:99Q, 03:106-03:107, 03:110-03:113, 03:117, 03:123-03:126, 03:136-03:137, 03:141, 03:145-03:146, 03:149, 03:153, 03:155-03:156, 03:161, 03:168, 03:174-03:179, 03:184-03:185, 03:190, 03:199-03:200, 03:203-03:205, 03:209-03:215, 03:217, 03:220-03:225, 03:227-03:230, 03:233-03:234, 03:237N-03:240, 03:245, 03:247-03:249, 03:251, 03:259, 03:261, 03:263:01:01-03:263:01:02, 03:265, 03:269N-03:270, 03:273-03:274, 03:277-03:280, 03:282N-03:283, 03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:304, 03:308, 03:310N, 03:313, 03:315-03:316, 03:319-03:324, 03:332-03:334N, 03:336-03:337, 03:339N, 03:343-03:345, 03:348-03:349, 03:351-03:352, 03:356N-03:357N, 03:359, 03:362-03:365, 03:367-03:369, 03:371, 03:374-03:375N, 03:379, 03:382-03:384, 03:386, 03:388, 03:392-03:393, 03:395, 03:397-03:398, 03:402-03:403N, 03:405-03:406, 03:409-03:416, 03:422N, 03:429, 03:433, 03:437, 03:440N-03:442, 03:444-03:447, 03:450, 03:452-03:453, 03:456-03:457, 03:459, 03:461-03:464, 03:466, 03:471, 03:477-03:479, 03:481, 03:484, 03:487, 03:489-03:490, 03:493-03:495, 03:498, 03:500-03:502, 03:504-03:505, 03:507, 03:509N, 04:03:01-04:03:03 |
| **10** | 120 bp145 bp175 bp | \*02:11, 02:25\*02:26, 03:04:01:01-03:04:04, 03:14:01-03:14:02, 03:80, 03:138, 03:318, 03:327, 03:443, 03:474, 06:246\*03:58 |
| **11** | 95 bp 130 bp | \*03:20\*03:05:01-03:05:05, 03:17:01-03:17:02, 03:53, 03:61-03:62, 03:72, 03:100, 03:132, 03:181, 03:226, 03:244, 03:250, 03:262, 03:272, 03:346, 04:09, 04:63, 04:75, 05:131, 05:276 |
| **12**  | 65 bp 105 bp140 bp195 bp | \*03:40, 03:353\*03:03:06, 03:06, 03:25:01-03:25:02, 03:234, 03:239, 04:01:03, 04:02:16, 04:03:03\*03:08, 03:119, 03:137, 03:194, 06:02:02, 06:03:02, 06:03:34, 06:145:02, 06:208:02, 06:210\*03:57 |
| **13** | 110 bp 145 bp190 bp | \*03:15\*02:62, 03:07, 03:16, 03:438\*02:196, 03:54, 03:162, 03:183, 03:204, 03:223, 03:233, 03:351, 04:35 |
| **14** | 135 bp175 bp 260 bp | \*03:09, 05:56\*03:55, 03:250\*03:11, 03:26, 03:244 |
| **15** | 140 bp 195 bp245 bp | \*03:10:01-03:10:02:02, 03:12, 03:14:01-03:14:02, 03:70, 03:179, 03:183, 03:195, 03:474, 06:01:01:01-06:01:31, 06:01:33-06:01:34, 06:06?, 06:43, 06:54N-06:58, 06:98, 06:99:02-06:105, 06:108, 06:120, 06:132, 06:140, 06:153:01-06:153:02, 06:157, 06:167-06:168, 06:177, 06:181, 06:194, 06:205, 06:209, 06:214, 06:229, 06:239, 06:243, 06:245-06:247, 06:251, 06:257-06:258, 06:260, 06:263, 06:268, 06:274, 06:277, 06:285, 06:302, 06:305, 06:307, 06:309-06:310, 06:312, 06:321, 06:323, 06:330N, 06:342, 06:359, 06:377, 06:382, 06:415, 06:418-06:419, 06:421, 06:427, 06:435, 06:462-06:464, 06:466\*02:42, 02:78\*03:27, 03:82 |
| **17**  | 110 bp 155 bp175 bp 215 bp 300 bp | \*05:03:12, 05:43:02, 06:23, 06:82, 06:99:01, 06:156, 06:162, 06:169, 06:233, 06:340, 06:389\*02:10, 02:81, 03:13, 03:49:01:01-03:49:01:02, 03:286, 03:402, 03:471, 04:32, 05:152, 05:314, 06:359, 06:381, 06:396\*03:28, 03:232\*03:47\*02:154, 03:458, 04:66, 05:250, 05:280, 05:307, 06:34 |
| **18**  | 80 bp135 bp 185 bp 220 bp260 bp | \*03:188\*03:24, 03:79, 03:282N, 03:447, 04:81\*03:60, 03:73, 03:112, 03:118N, 03:226, 03:237N, 03:371, 04:30, 05:73, 05:98, 05:116, 06:28, 06:56, 06:79:01-06:79:02, 06:144N, 06:451\*03:18, 06:393\*02:36, 03:479 |
| **21**  | 125 bp205 bp | \*04:11\*04:01:01:01-04:01:06, 04:05-04:08, 04:14-04:17, 04:27, 04:38, 04:42, 04:61-04:62, 04:69, 04:71, 04:73N-04:74, 04:90, 04:92-04:95 |
| **22** | 140 bp205 bp | \*04:14\*03:132, 04:02:01:01, 04:02:01:04-04:02:07, 04:02:09-04:02:21, 04:02:23-04:03:01, 04:04, 04:09-04:13, 04:18-04:19, 04:21-04:37, 04:39-04:41N, 04:43-04:47, 04:49-04:60, 04:63-04:68N, 04:70, 04:72, 04:75-04:89, 04:91 |
| **24** | 115 bp215 bp | \*05:02:01:01-05:02:26, 05:05:01-05:05:02, 05:14, 05:17, 05:19, 05:26, 05:33-05:37, 05:46-05:47, 05:53, 05:57, 05:59, 05:65, 05:79, 05:83, 05:86-05:88, 05:90N, 05:94, 05:100, 05:102, 05:106, 05:113, 05:116-05:118, 05:123, 05:125, 05:135-05:136, 05:142, 05:145, 05:153, 05:165, 05:170, 05:172, 05:174-05:175, 05:178-05:179, 05:181, 05:186, 05:189, 05:192, 05:196, 05:198-05:199, 05:222, 05:227, 05:229, 05:231, 05:238-05:239, 05:241, 05:247, 05:250-05:251, 05:253-05:254, 05:257, 05:274, 05:278, 05:284, 05:287, 05:309, 05:311\*05:72 |
| **25** | 100 bp125 bp220 bp | \*03:226, 03:272, 04:28, 05:01:09-05:01:10, 05:02:02, 05:02:18, 05:03:01:01-05:03:11, 05:03:13, 05:03:15-05:03:19, 05:03:21-05:03:23, 05:03:25-05:03:29, 05:06:01-05:06:02, 05:08-05:10, 05:13, 05:15-05:16, 05:24, 05:28, 05:38-05:42, 05:50, 05:56, 05:58, 05:60, 05:64, 05:66:01-05:67, 05:78, 05:85, 05:91, 05:96, 05:98, 05:101, 05:108-05:109, 05:119, 05:121, 05:129-05:130, 05:140, 05:143, 05:147, 05:149, 05:161, 05:191, 05:200-05:206N, 05:208N-05:214, 05:218, 05:220-05:221, 05:224N, 05:233, 05:235N-05:236N, 05:240, 05:243, 05:245, 05:259-05:260, 05:264-05:265N, 05:273N, 05:280-05:282, 05:289, 05:292-05:294, 05:296, 05:305-05:306, 05:312, 05:314, 05:318\*03:272, 05:03:01:01-05:03:01:09, 05:03:03-05:03:23, 05:03:25-05:03:30, 05:06:01-05:06:02, 05:08-05:10, 05:13, 05:15-05:16, 05:23-05:24, 05:28, 05:38-05:43:01, 05:50, 05:56, 05:58, 05:60, 05:64, 05:66:01-05:67, 05:78, 05:85, 05:91, 05:96, 05:98, 05:101, 05:108-05:109, 05:119, 05:121, 05:129-05:131, 05:134, 05:140, 05:147, 05:149, 05:161, 05:191, 05:200-05:206N, 05:208N-05:214, 05:218, 05:220-05:221, 05:224N, 05:233, 05:235N-05:236N, 05:243, 05:245, 05:259-05:260, 05:264-05:265N, 05:273N, 05:276, 05:280-05:282, 05:289, 05:293:01-05:294, 05:296, 05:305-05:306, 05:312, 05:314, 05:318\*05:72, 05:128N |
| **27** | 170 bp210 bp | \*03:67, 03:311, 06:457 \*06:01:01:01-06:02:59, 06:05:02?-06:06?, 06:10-06:11:04, 06:13:01-06:13:03, 06:16, 06:18:01-06:20, 06:24, 06:29, 06:33, 06:35, 06:37, 06:43, 06:45, 06:47-06:51:02, 06:53:01-06:57:02, 06:68, 06:70-06:84:01:02, 06:95-06:109, 06:111-06:117, 06:120, 06:122-06:127, 06:130-06:132, 06:136-06:140, 06:147, 06:150-06:153:02, 06:157, 06:159, 06:161, 06:163, 06:166-06:167, 06:173-06:179N, 06:181-06:183, 06:188, 06:192, 06:197-06:198, 06:200-06:201, 06:205, 06:208:01-06:209, 06:211, 06:213-06:216N, 06:219, 06:224-06:229, 06:232-06:233, 06:235-06:237, 06:240, 06:242-06:243, 06:245-06:247, 06:249, 06:251, 06:255-06:258, 06:260, 06:262-06:264, 06:268, 06:270:01-06:271, 06:273-06:274, 06:277, 06:284-06:286, 06:289-06:290, 06:293-06:298, 06:300, 06:302, 06:304N, 06:306N-06:312, 06:314-06:315, 06:317N, 06:319:01-06:319:02, 06:321-06:324, 06:326, 06:330N, 06:333, 06:335, 06:337-06:338, 06:340-06:341N, 06:344, 06:347, 06:354-06:357, 06:359, 06:363-06:364, 06:366, 06:370, 06:372, 06:374, 06:376-06:377, 06:379N-06:380, 06:382, 06:384, 06:388, 06:390, 06:395, 06:397N, 06:401-06:402, 06:404-06:406, 06:408-06:409, 06:411-06:413, 06:416Q-06:419, 06:421-06:422N, 06:427, 06:430-06:431, 06:435-06:438, 06:442, 06:445-06:448, 06:457, 06:461-06:464, 06:466 |
| **30** | 65 bp105 bp150 bp 205 bp235 bp | \*02:67N\*04:15-04:16\*03:23:01, 05:03:12, 05:43:02, 06:03:01:01-06:03:03, 06:03:05-06:03:07, 06:03:11-06:03:25, 06:03:27-06:03:33, 06:03:35-06:03:46, 06:04:02, 06:07:01, 06:08:01, 06:09:02, 06:11:01:01-06:11:03, 06:26N, 06:28, 06:30-06:32:01, 06:40-06:41:01:03, 06:44, 06:59-06:62, 06:64-06:65, 06:67, 06:90-06:92:02, 06:94, 06:110, 06:118:01, 06:118:03, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:161, 06:165, 06:169-06:170, 06:184-06:185, 06:187, 06:191, 06:195-06:196, 06:199, 06:203, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:248, 06:250, 06:253, 06:259, 06:272, 06:276, 06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367, 06:371, 06:385, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:442-06:443, 06:450, 06:454N-06:455, 06:459-06:460\*04:20, 04:27\*03:06, 03:25:01, 04:04-04:05, 04:18 |
| **33**  | 110 bp170 bp | \*03:133, 03:199-03:200, 03:462\*06:04:01:01-06:05:02, 06:06w, 06:07:01-06:07:02, 06:09:01:01-06:09:03, 06:09:05-06:09:12, 06:18:01-06:18:02, 06:22:02, 06:25, 06:27:01-06:27:02, 06:32:01-06:32:02, 06:34, 06:36, 06:38-06:39, 06:52, 06:58, 06:66, 06:69:01, 06:85-06:86, 06:88:01:01-06:89, 06:93-06:94, 06:118:01-06:118:02, 06:118:04, 06:121, 06:129, 06:135, 06:142, 06:155, 06:158N, 06:160, 06:164, 06:168, 06:171-06:172, 06:180, 06:186, 06:189, 06:193N, 06:202, 06:204, 06:207, 06:217, 06:241, 06:252N, 06:254, 06:261, 06:265-06:267, 06:280-06:283, 06:287-06:288, 06:291-06:292, 06:299, 06:303N, 06:313, 06:318, 06:320, 06:339, 06:343, 06:348-06:349, 06:351, 06:353, 06:358, 06:361, 06:368-06:369, 06:375, 06:381, 06:387, 06:398, 06:407, 06:414N, 06:420, 06:426, 06:429, 06:432, 06:434, 06:439Q, 06:444, 06:449, 06:452N, 06:458N, 06:465 |
| **34** | 95 bp120 bp 180 bp | \*05:07\*03:259, 05:25, 05:75, 06:04:01:01-06:05:01, 06:06, 06:08:01-06:09:12, 06:12-06:13:03, 06:17-06:18:02, 06:21-06:22:03, 06:27:01-06:27:02, 06:34, 06:36, 06:38-06:39, 06:42, 06:52, 06:58, 06:69:01-06:69:02, 06:85-06:86, 06:88:01:01-06:89, 06:93, 06:119, 06:121, 06:129, 06:135, 06:142, 06:149, 06:155, 06:158N, 06:160, 06:164, 06:171, 06:180, 06:186, 06:189, 06:193N, 06:202, 06:204, 06:206:01-06:207, 06:217, 06:231, 06:241, 06:252N, 06:254, 06:261, 06:265-06:267, 06:280-06:283, 06:287-06:288, 06:291-06:292, 06:299, 06:301, 06:313, 06:318-06:319:02, 06:339, 06:343, 06:348-06:349, 06:351, 06:353, 06:358, 06:361, 06:368-06:369, 06:375, 06:381, 06:387, 06:398, 06:407, 06:414N, 06:417, 06:420, 06:426, 06:432, 06:434, 06:439Q, 06:441, 06:444, 06:449, 06:452N, 06:455, 06:458N, 06:465\*05:112 |
| **35**  | 85 bp155 bp215 bp 255 bp | \*05:103, 05:231\*03:27, 03:48, 03:87, 06:35, 06:53:01-06:53:02, 06:145:01-06:145:02, 06:208:01-06:208:02\*05:101, 05:145, 06:151, 06:212, 06:260\*03:31, 05:73, 05:80, 05:98, 05:116, 06:05:01, 06:05:02?-06:06?, 06:20, 06:31, 06:45, 06:156, 06:442 |
| **36**  | 95 bp155 bp180 bp210 bp | \*03:90N\*06:164\*03:68\*06:05:01, 06:05:02?-06:06?, 06:09:01:01-06:09:12, 06:12, 06:15:01-06:15:02, 06:22:01-06:22:03, 06:42, 06:46, 06:66, 06:88:01:01-06:88:01:02, 06:94, 06:118:01-06:119, 06:121, 06:142, 06:189, 06:207, 06:212w, 06:275, 06:281-06:282, 06:287, 06:299, 06:339, 06:348, 06:353, 06:358, 06:386, 06:420, 06:429, 06:432, 06:441 |
| **37** | 130 bp165 bp185 bp | \*02:152, 05:63\*05:39\*05:21, 06:06, 06:149, 06:276 |
| **38** | 100 bp130 bp185 bp235 bp | \*04:28, 05:38, 05:62, 05:79, 05:119-05:121, 05:156, 06:14:01-06:14:03, 06:69:01-06:69:02, 06:156, 06:162, 06:168, 06:194, 06:206:01-06:206:02, 06:244, 06:269, 06:278, 06:368, 06:451, 06:453\*05:04, 05:08, 05:18:01-05:18:02, 05:26, 05:52, 05:77, 05:132Q, 05:146, 05:262, 06:221, 06:254w, 06:273\*04:33, 05:79, 06:10, 06:130, 06:188, 06:214 \*04:33 |
| **39** | 115 bp140 bp180 bp | \*03:88, 05:111\*03:24, 03:79, 03:165, 03:447, 04:81\*03:29-03:30, 03:52, 03:72, 03:100, 03:132, 03:179, 03:191, 03:215, 03:270, 03:474, 04:09, 04:13, 04:63, 04:75, 05:62, 05:120, 06:13:01-06:13:03, 06:16, 06:22:01-06:22:03, 06:29, 06:55, 06:69:01-06:69:02, 06:96:01-06:96:02, 06:119, 06:139, 06:202, 06:206:01-06:206:02, 06:209, 06:247, 06:322:01-06:322:03, 06:337, 06:368, 06:389, 06:417 |
| **40**  | 110 bp 150 bp205 bp | \*03:245, 05:45, 05:201, 06:40\*02:64, 02:79, 02:108, 02:144, 03:21-03:22:02, 03:96, 03:251, 03:452, 04:23, 05:35, 05:103w, 05:182, 05:226, 05:231w, 05:259, 06:04:01:01w-06:04:15w, 06:04:17w-06:05:02w, 06:06?, 06:07:01w-06:07:02w, 06:08:02?-06:08:03?, 06:09:01:01w-06:09:12w, 06:11:02?-06:11:03?, 06:12w, 06:13:02?-06:13:03?, 06:15:01?, 06:17?-06:18:01?, 06:18:02w, 06:19:01?, 06:21w, 06:22:01?-06:25?, 06:27:02?, 06:29?-06:32:02?, 06:34w, 06:35?, 06:36w, 06:38w, 06:40, 06:41:01:01w-06:42w, 06:45?, 06:50?, 06:51:02?, 06:52w, 06:53:01?-06:54N?, 06:56?-06:57:01?, 06:58w, 06:59?-06:61?, 06:63?-06:67?, 06:69:01?-06:72?, 06:76?, 06:79:02?-06:83?, 06:84:01:01w-06:84:01:02w, 06:85?, 06:89?, 06:91?, 06:93?-06:97?, 06:118:01w, 06:118:02?-06:118:03?, 06:118:04w, 06:119?-06:121?, 06:123?-06:124?, 06:126?, 06:128?, 06:129w, 06:131?-06:141?, 06:142w, 06:143?-06:145:01?, 06:146:01?-06:147?, 06:149?-06:153:01?, 06:154?-06:163?, 06:164w, 06:165?-06:170?, 06:171w, 06:172?-06:184?, 06:186w, 06:189w, 06:190:01?-06:199?, 06:201?-06:204?, 06:206:01?, 06:206:02w, 06:207?-06:208:01?, 06:210?-06:215?, 06:217w, 06:229?-06:236?, 06:238?, 06:241?, 06:243, 06:244?, 06:246?-06:247?, 06:249?, 06:252N?, 06:254w, 06:255, 06:260?, 06:261w, 06:263?, 06:265w-06:267w, 06:268?, 06:275w, 06:277?, 06:280w-06:283w, 06:287w-06:288w, 06:291w-06:292w, 06:299w, 06:301w, 06:303Nw, 06:313w, 06:318w-06:319:02w, 06:320?, 06:325w, 06:332w, 06:339w, 06:343w, 06:348w-06:349w, 06:351w, 06:353w, 06:358w, 06:361w, 06:369w, 06:371?, 06:374?, 06:375w, 06:378?-06:379N?, 06:381w, 06:385w-06:386w, 06:389?, 06:393?, 06:398w, 06:407w, 06:414Nw, 06:420w-06:421w, 06:423N?, 06:426w, 06:429w, 06:432w, 06:434w, 06:439Qw-06:441w, 06:444w, 06:449w, 06:452Nw, 06:458Nw, 06:462?-06:464?, 06:465w\*02:96N, 05:41N, 05:90N, 05:133 |
| **41** | 165 bp190 bp230 bp265 bp 300 bp | \*03:213N, 03:228, 06:17, 06:24, 06:30, 06:42\*03:45:01, 03:420, 05:27, 06:38 \*02:47, 03:212\*06:127\*06:52 |
| **42**  | 105 bp 135 bp160 bp 190 bp230 bp | \*03:41, 03:224, 04:06, 04:12, 04:16\*03:25:01-03:25:02, 03:66N, 03:234, 03:239, 04:03:01-04:03:03, 06:10, 06:25, 06:130, 06:193N, 06:429\*03:213N, 04:18\*02:08, 03:06, 03:25:01, 03:230, 04:03:01-04:03:03, 05:79\*04:18 |
| **43**  | 85 bp110 bp 155 bp 185 bp 215 bp240 bp 270 bp | \*03:59, 06:37, 06:374\*06:37, 06:374\*02:05, 03:204, 06:100\*06:26N, 06:100\*06:26N\*03:71, 06:33, 06:143, 06:351\*06:33, 06:143  |
| **44** | 120 bp 165 bp | \*03:42, 03:89, 03:164, 04:44\*03:94, 03:191, 04:02:07, 04:09, 05:62, 06:02:01:01-06:02:04, 06:02:06-06:02:59, 06:10, 06:13:01-06:16, 06:20, 06:22:01-06:24, 06:29, 06:33, 06:37, 06:46-06:51:02, 06:68-06:84:01:02, 06:96:01-06:97, 06:106-06:107, 06:109, 06:111-06:117, 06:119, 06:122, 06:124-06:127, 06:130, 06:136-06:138, 06:146:01-06:147, 06:150-06:151, 06:156, 06:159, 06:161-06:162, 06:166, 06:173-06:175, 06:178-06:179N, 06:182-06:183, 06:188, 06:192, 06:198, 06:200-06:201, 06:206:01-06:206:02, 06:208:01-06:208:02, 06:211, 06:213, 06:215-06:216N, 06:219, 06:224-06:228, 06:232, 06:235-06:237, 06:240, 06:242, 06:249, 06:255-06:256, 06:262, 06:264, 06:270:02-06:271, 06:273, 06:284, 06:286, 06:289-06:290, 06:293-06:298, 06:300, 06:304N, 06:306N, 06:308N, 06:311, 06:314-06:315, 06:317N, 06:324, 06:326, 06:333, 06:335, 06:338, 06:341N, 06:344, 06:347, 06:355-06:357, 06:363-06:364, 06:366, 06:368, 06:370, 06:374, 06:376, 06:379N-06:380, 06:383N-06:384, 06:386, 06:388-06:390, 06:395, 06:397N, 06:401-06:402, 06:404-06:406, 06:408-06:409, 06:411-06:413, 06:416Q-06:417, 06:422N, 06:430-06:431, 06:436-06:438, 06:445-06:448, 06:451, 06:456N-06:457, 06:461 |
| **45** | 130 bp155 bp225 bp260 bp | \*06:07:01-06:07:02, 06:15:01-06:15:02, 06:36, 06:46, 06:66, 06:92:02, 06:118:01-06:118:04, 06:172, 06:216N, 06:224, 06:275, 06:385-06:386\*06:164\*06:212\*06:85 |
| **46** | 160 bp 210 bp | \*06:03:01:01-06:03:14, 06:03:16-06:03:18, 06:03:20-06:03:46, 06:08:01-06:08:03, 06:14:01-06:14:03, 06:21, 06:28, 06:31, 06:40-06:41:01:03, 06:44, 06:59, 06:61, 06:63-06:65, 06:67, 06:87, 06:90-06:92:02, 06:110, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:170, 06:184-06:185, 06:187, 06:190:01-06:191, 06:195-06:196, 06:199, 06:203, 06:206:01-06:206:02, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:244, 06:248, 06:250, 06:253, 06:259, 06:269, 06:272, 06:278-06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367, 06:371, 06:373, 06:378, 06:385, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:443, 06:450-06:451, 06:453-06:455, 06:459-06:460\*06:03:01:01-06:03:10, 06:03:12-06:03:46, 06:08:01-06:08:03, 06:14:01-06:14:03, 06:27:01-06:28, 06:30-06:32:02, 06:40-06:41:01:03, 06:44, 06:59-06:65, 06:67, 06:87, 06:90-06:91, 06:110, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:168, 06:170, 06:184-06:185, 06:187, 06:190:01-06:191, 06:195-06:196, 06:206:01-06:206:02, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:244, 06:248, 06:250, 06:253, 06:259, 06:269, 06:272, 06:276, 06:278-06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367-06:368, 06:371, 06:373, 06:378, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:443, 06:450-06:451, 06:453-06:455, 06:459-06:460 |
| **47**  | 110 bp 155 bp | \*03:42\*03:30, 03:72, 03:84N, 03:98, 03:100, 03:132, 03:215, 04:01:01:01-04:02:01:01, 04:02:01:04-04:03:03, 04:06-04:10, 04:12-04:14, 04:16-04:36N, 04:38-04:72, 04:74-04:95, 05:38, 05:119, 06:02:05, 06:02:16, 06:13:02, 06:14:03, 06:19:01-06:19:02, 06:22:01-06:22:02, 06:69:01-06:69:02, 06:95, 06:119, 06:123w, 06:139, 06:152, 06:206:02, 06:322:01-06:322:03, 06:337, 06:368 |
| **48** | 170 bp225 bp | \*03:32, 03:43, 04:07\*03:85 |
| **49**  | 105 bp140 bp 165 bp240 bp | \*03:33, 03:328, 04:56, 05:32, 05:42, 05:45, 05:201, 05:281, 06:228, 06:304N \*02:169, 03:319, 03:347, 04:70, 05:14, 05:84, 05:87Q, 05:132Q, 05:211, 06:103, 06:284, 06:350\*02:33, 02:41, 03:35, 03:315, 03:322\*03:246, 06:310 |
| **50** | 130 bp155 bp190 bp210 bp240 bp | \*03:130, 03:271, 03:282N\*03:80, 03:139, 03:257\*03:37, 03:162, 03:183, 03:223, 03:233, 03:252, 03:351\*03:38:01-03:38:02, 03:46, 03:201, 03:277, 03:500\*02:14:01:01-02:14:02, 03:34, 03:143, 04:67  |
| **51** | 125 bp 160 bp185 bp245 bp270 bp | \*03:36, 03:39, 03:53, 03:62, 03:149\*02:10, 02:81, 03:49:01:01-03:49:01:02, 03:286, 03:402, 03:471, 05:152, 05:314, 06:359, 06:381, 06:396\*03:51, 03:287\*03:447\*02:09, 03:330 |
| **52** | 95 bp 220 bp | \*03:06?-03:07?, 03:14:01?-03:15?, 03:17:01?-03:18?, 03:19:01:01-03:19:06, 03:20?, 03:23:01?, 03:23:03?, 03:25:02?-03:26?, 03:48?, 03:52?-03:54?, 03:56?-03:67?, 03:69?-03:70?, 03:71, 03:74?-03:78?, 03:81?-03:82?, 03:101?-03:104?, 03:106?-03:112?, 03:118N?, 03:120?-03:125?, 03:127?-03:131?, 03:133?-03:135?, 03:137?, 03:140?-03:149?, 03:150, 03:152?-03:163?, 03:165?-03:167?, 03:170?-03:171?, 03:173?-03:179?, 03:183?, 03:185?, 03:187, 03:188?-03:189?, 03:192?-03:194?, 03:201?-03:205?, 03:207?-03:210?, 03:212?-03:214?, 03:216?-03:221?, 03:223?-03:228?, 03:230?, 03:232?-03:238?, 03:240?, 03:244?, 03:255?-03:262?, 03:263:01:01-03:263:01:02, 03:267?-03:270?, 03:273?-03:275?, 03:278?, 03:286, 03:335, 03:351?-03:353?, 03:356N?, 03:359?, 03:360, 03:376N, 03:381, 03:387?, 03:394, 03:401, 03:425?, 03:437?-03:438?, 03:441?, 03:449?-03:450?, 03:455?-03:456?, 03:485, 03:492?, 04:08\*06:98, 06:126 |
| **53** | 130 bp160 bp195 bp | \*03:162, 03:183, 03:223, 03:233, 03:351, 06:153:01-06:153:02, 06:247, 06:340, 06:436\*02:51\*02:07:02, 05:09, 05:29-05:30, 06:252N |
| **54** | 110 bp150 bp 190 bp245 bp | \*05:17, 05:23, 05:242\*02:106, 03:115, 03:368, 04:43, 05:246, 05:287, 06:109-06:110, 06:269\*02:99, 03:249, 03:309:01, 03:312, 03:481, 05:10, 05:12, 05:47, 05:71, 05:159, 05:312, 06:105, 06:185, 06:225, 06:407, 06:432\*04:36N |
| **56** | 100 bp140 bp185 bp 220 bp265 bp | \*06:44, 06:47\*03:177, 06:224\*03:114, 03:197Q\*06:43\*03:83 |
| **57** | 150 bp185 bp | \*02:54\*02:07:01, 03:01:01:01-03:01:01:12, 03:01:01:14-03:01:35, 03:01:37-03:01:58, 03:04:01:01-03:04:04, 03:06?-03:07?, 03:09-03:10:03, 03:12-03:13, 03:14:01?-03:15?, 03:16, 03:17:01?-03:18?, 03:20?, 03:21-03:22:02, 03:23:01?, 03:23:03?, 03:24, 03:25:02?-03:26?, 03:27-03:29, 03:33?-03:34?, 03:35-03:36, 03:42, 03:44, 03:46-03:47, 03:48?, 03:49:01:01-03:51, 03:52?-03:54?, 03:55, 03:56?-03:67?, 03:69?-03:70?, 03:73, 03:74?-03:78?, 03:80, 03:81?-03:82?, 03:83-03:84N, 03:92-03:94, 03:101?-03:104?, 03:106?-03:112?, 03:113-03:116, 03:118N?, 03:119, 03:120?-03:125?, 03:127?-03:131?, 03:133?-03:135?, 03:137?, 03:139, 03:140?-03:149?, 03:151, 03:152?-03:163?, 03:164, 03:165?-03:167?, 03:169, 03:170?-03:171?, 03:172, 03:173?-03:179?, 03:182, 03:183?, 03:185?, 03:186, 03:188?-03:189?, 03:191, 03:192?-03:194?, 03:196-03:198:02, 03:201?-03:205?, 03:206, 03:207?-03:210?, 03:212?-03:214?, 03:216?-03:221?, 03:223?-03:228?, 03:230?, 03:231, 03:232?-03:238?, 03:240?, 03:241-03:243, 03:244?, 03:246, 03:252-03:254, 03:255?-03:262?, 03:264, 03:266, 03:267?-03:270?, 03:271, 03:273?-03:275?, 03:276N, 03:278?, 03:281, 03:284-03:285, 03:288, 03:290-03:294, 03:297, 03:302-03:303N, 03:305-03:307, 03:309:01-03:309:02, 03:311, 03:314, 03:317:01-03:318, 03:326-03:331, 03:338N, 03:340N-03:342, 03:347, 03:350, 03:351?-03:353?, 03:354N-03:355, 03:356N?, 03:359?, 03:361, 03:366, 03:372-03:373, 03:377-03:378, 03:380, 03:385N, 03:387?, 03:389-03:391, 03:396, 03:399N-03:400N, 03:404, 03:407N-03:408, 03:417-03:421, 03:423-03:424, 03:425?, 03:426-03:428, 03:430-03:432, 03:434-03:436, 03:437?-03:438?, 03:439, 03:441?, 03:443, 03:448, 03:449?-03:450?, 03:451, 03:454, 03:455?-03:456?, 03:458, 03:460, 03:465, 03:467-03:470, 03:472-03:473N, 03:475-03:476, 03:480Q, 03:482-03:483, 03:486, 03:488N, 03:491, 03:492?, 03:496?-03:497?, 03:499N?, 03:503?, 03:506?, 03:508?, 05:27 |
| **58** | 145 bp180 bp215 bp250 bp | \*03:119, 03:228, 06:17, 06:24, 06:30, 06:42\*03:56, 05:05:01-05:05:02, 05:11:01-05:11:02, 05:28, 05:66:01-05:66:02, 05:240, 06:06?, 06:129, 06:146:01, 06:241\*03:119, 03:228, 05:30, 06:17, 06:24, 06:30, 06:42\*03:56, 05:03:02, 05:20:02, 05:51-05:52, 05:119, 05:125, 06:06?, 06:129, 06:146:01, 06:241 |
| **59**  | 100 bp190 bp220 bp | \*03:44, 05:13, 05:117, 05:169\*03:114, 06:54N\*05:24, 05:101, 05:145 |
| **60** | 110 bp150 bp180 bp | \*05:88\*05:40, 05:69, 05:153\*05:15, 05:33, 05:49 |
| **61** | 110 bp150 bp215 bp | \*05:88\*05:40, 05:69, 05:153\*05:16, 05:34, 05:44, 05:73, 05:98, 05:116, 05:128N, 05:130, 06:156, 06:162, 06:169 |
| **62** | 90 bp140 bp165 bp225 bp | \*03:205, 03:214, 05:110N\*03:75, 06:97, 06:158N, 06:465\*05:62, 06:02:19, 06:13:03, 06:79:02, 06:95\*03:30, 03:72, 03:100, 03:215, 06:15:01-06:15:02, 06:22:01-06:22:03, 06:37, 06:48:01-06:48:02, 06:51:01-06:51:02, 06:69:01-06:69:02, 06:139, 06:368, 06:417 |
| **63** | 95 bp180 bp220 bp | \*03:240\*06:50\*03:86 |
| **64**  | 100 bp160 bp230 bp | \*02:16, 02:21 \*02:51, 03:276N, 03:395, 04:17\*02:20:01:01N-02:20:01:02N |
| **65** | 115 bp220 bp | \*02:21, 02:32, 05:36, 06:326\*02:46 |
| **66** | 110 bp125 bp165 bp205 bp255 bp | \*03:116, 03:432, 05:57\*02:17-02:18N, 03:317:01-03:317:02, 05:31, 05:46, 05:108, 06:111, 06:265, 06:455\*02:19\*02:96N, 05:41N, 05:90N, 05:133\*02:126, 03:243 |
| **67** | 100 bp155 bp | \*02:15, 02:27, 02:58N\*02:26, 02:30 |
| **68** | 100 bp175 bp | \*02:23-02:24, 02:27\*02:28 |
| **69** | 105 bp140 bp185 bp | \*02:24, 02:31, 02:58N\*03:225\*02:29 |
| **71**  | 55 bp135 bp160 bp235 bp | \*03:188\*03:63, 03:76, 03:139, 03:168, 03:211\*03:118N, 03:237N, 06:144N\*03:146, 03:207, 06:195 |
| **72** | 145 bp180 bp210 bp270 bp | \*03:64, 05:37, 05:104, 06:218, 06:250\*02:50, 03:77, 03:118N, 03:237N\*03:99Q, 03:201, 03:269N\*03:150, 03:490 |
| **73** | 90 bp125 bp160 bp200 bp225 bp270 bp | \*02:53Q, 03:65\*03:23:01-03:23:02, 03:217, 03:355, 04:10\*03:211\*03:269N\*02:116, 03:78, 03:81, 03:159\*03:150, 03:490 |
| **74** | 115 bp140 bp185 bp | \*05:19, 05:22\*04:25N, 05:97, 05:143\*05:71 |
| **75**  | 115 bp155 bp175 bp205 bp | \*05:75\*03:102, 05:20:01\*03:197Q, 05:122, 06:06?, 06:55, 06:58, 06:202, 06:247\*03:194, 06:122, 06:148, 06:161, 06:278, 06:302, 06:412 |
| **76** | 150 bp185 bp | \*03:01:38, 03:04:02, 03:10:01, 03:12, 03:14:02, 03:70, 03:179, 03:195, 03:474, 06:01:01:01-06:01:06, 06:01:08-06:01:34, 06:43, 06:53:01-06:57:02, 06:98-06:105, 06:108, 06:120, 06:132, 06:140, 06:153:01-06:153:02, 06:157, 06:167-06:168, 06:177, 06:181, 06:194, 06:205, 06:209, 06:214, 06:229, 06:239, 06:243, 06:245-06:247, 06:251, 06:257-06:258, 06:260, 06:263, 06:268, 06:274, 06:277, 06:285, 06:302, 06:305, 06:307, 06:309-06:310, 06:312, 06:321, 06:323, 06:330N, 06:342, 06:359, 06:377, 06:382, 06:415, 06:418-06:419, 06:421, 06:427, 06:435, 06:462-06:464, 06:466\*06:54N |
| **77** | 95 bp120 bp190 bp | \*06:155\*06:190:01-06:190:02\*06:60-06:61 |
| **78** | 95 bp130 bp170 bp | \*03:217, 03:275, 06:64\*03:232, 03:283, 06:94, 06:170, 06:190:01-06:190:02\*06:62 |
| **79** | 90 bp125 bp200 bp | \*06:65\*06:93\*06:116, 06:187 |
| **80**  | 105 bp175 bp290 bp | \*06:70\*06:76, 06:163\*06:02:04, 06:72 |
| **81** | 120 bp170 bp | \*03:95N, 03:210\*03:30, 03:72, 03:100, 03:132, 03:158, 03:170, 03:215, 04:09, 04:63, 04:75, 06:29, 06:71, 06:96:01-06:96:02, 06:139, 06:163, 06:322:01-06:322:03, 06:337 |
| **82** | 170 bp230 bp280 bp | \*06:77N\*03:132, 06:107\*06:73 |
| **83** | 115 bp165 bp235 bp260 bp290 bp | \*04:46N, 05:185N\*06:78\*06:107\*06:74\*06:02:04, 06:72 |
| **84** | 115 bp195 bp | \*06:80, 06:217\*06:75N, 06:106 |
| **85** | 135 bp180 bp215 bp265 bp | \*06:184\*06:67, 06:174, 06:191\*06:68, 06:112N\*06:127 |
| **86** | 95 bp130 bp180 bp220 bp | \*06:59, 06:90, 06:150, 06:191 \*06:99:01-06:99:03, 06:112N, 06:210, 06:233, 06:244, 06:252N, 06:269-06:270:01, 06:278\*06:90, 06:191\*06:112N, 06:233, 06:244, 06:269-06:270:01, 06:278, 06:302 |
| **87** | 105 bp140 bp | \*03:08, 03:137, 03:194, 06:29, 06:59, 06:63, 06:87, 06:91, 06:96:01-06:96:02, 06:150, 06:322:01-06:322:03, 06:337\*06:179N, 06:184 |
| **88** | 110 bp215 bp | \*06:125\*06:57:01, 06:81 |
| **89** | 110 bp150 bp185 bp260 bp | \*06:125\*06:101\*06:144N\*06:83 |
| **90** | 105 bp130 bp175 bp240 bp | \*04:41N\*06:102N\*03:247, 03:285\*03:97, 03:117, 03:329, 03:349, 03:381, 06:86, 06:104, 06:117, 06:343, 06:366 |
| **91** | 70 bp100 bp185 bp | \*03:03:28, 03:10:02:01-03:10:03, 03:38:02, 03:183, 04:02:07w, 05:03:14, 05:03:20, 05:03:30, 05:43:01, 05:131, 05:276, 06:01:12, 06:02:43, 06:03:33, 06:51:01, 06:66, 06:96:01, 06:99:01, 06:118:04, 06:172, 06:322:01\*06:01:12, 06:51:01-06:51:02, 06:99:01, 06:142\*03:158 |
| **92** | 105 bp120 bp155 bp190 bp230 bp | \*02:22\*02:32\*02:19, 02:54\*02:78\*02:12 |
| **93** | 95 bp170 bp225 bp | \*03:91Q\*02:13, 02:41, 03:322\*03:85 |
| **95** | 95 bp120 bp | \*03:105-03:106, 03:109, 03:120\*05:04, 05:52, 05:77, 05:132Q, 05:146, 05:262 |

**4**The following DQB1 alleles can be distinguished by the different sizes of the specific PCR product:

|  |  |  |  |
| --- | --- | --- | --- |
| Alleles | Primer mix | Alleles | Primer mix |
| DQB1\*02:15, 02:30 | 67 | DQB1\*05:10, 05:23, 05:312 | 54 |
| DQB1\*02:23, 02:28 | 68 | DQB1\*05:11:01-05:11:02, 05:20:02 | 58 |
| DQB1\*02:29, 02:31 | 69 | DQB1\*05:12, 05:159, 05:242, 05:246 | 54 |
| DQB1\*02:99, 02:106 | 54 | DQB1\*05:13, 05:24 | 59 |
| DQB1\*03:03:06, 03:40 | 12 | DQB1\*05:17, 05:47, 05:287 | 54 |
| DQB1\*03:13, 03:47, 03:458 | 17 | DQB1\*05:25, 05:112 | 34 |
| DQB1\*03:31, 03:87 | 35 | DQB1\*06:02:19, 06:48:01-06:48:02 | 62 |
| DQB1\*03:35, 03:246, 03:328 | 49 | DQB1\*06:31, 06:145:01 | 35 |
| DQB1\*03:36, 03:51, 03:330 | 51 | DQB1\*06:35, 06:45 | 35 |
| DQB1\*03:46, 03:252, 03:271 | 50 | DQB1\*06:70, 06:76 | 80 |
| DQB1\*03:54, 03:438 | 13 | DQB1\*06:73, 06:77N | 82 |
| DQB1\*03:57, 03:353 | 12 | DQB1\*06:74, 06:78 | 83 |
| DQB1\*03:115, 03:309:01 | 54 | DQB1\*06:102N, 06:104 | 90 |
| DQB1\*03:116, 03:243, 03:317:01-03:317:02, 03:432 | 66 | DQB1\*06:109, 06:225 | 54 |
| DQB1\*03:143, 03:257 | 50 | DQB1\*06:110, 06:185 | 54 |
| DQB1\*04:05, 04:15 | 30 | DQB1\*06:151, 06:208:01 | 35 |
| DQB1\*04:32, 04:66 | 17 | DQB1\*06:188, 06:273 | 38 |
| DQB1\*04:36N, 04:43 | 54 |  |  |

**5**The DQB1 high primer set cannot separate the following alleles. These alleles can be distinguished by the DQB1\*05 kit.

|  |
| --- |
| Alleles |
| DQB1\*05:03:14, 05:03:20, 05:43:01 |

**6**This lot of the DQB1 high primer set cannot separate the DQB1\*03:01:01:01-03:01:01:12, 03:01:01:14-03:01:02, 03:01:04:01-03:01:07, 03:01:09-03:01:12, 03:01:14, 03:01:16-03:01:24, 03:01:26-03:01:33, 03:01:35, 03:01:39-03:01:58 and DQB1\*03:196 alleles; or the DQB1\*06:02:01:01-06:02:01:13, 06:02:03, 06:02:06, 06:02:08-06:02:15, 06:02:17-06:02:18, 06:02:20-06:02:27, 06:02:29-06:02:42, 06:02:44-06:02:46, 06:02:48-06:02:52 and the DQB1\*06:49 alleles.

Abbreviations

?: nucleotide sequence information not available for the primer matching sequence.

w: might be weakly amplified.