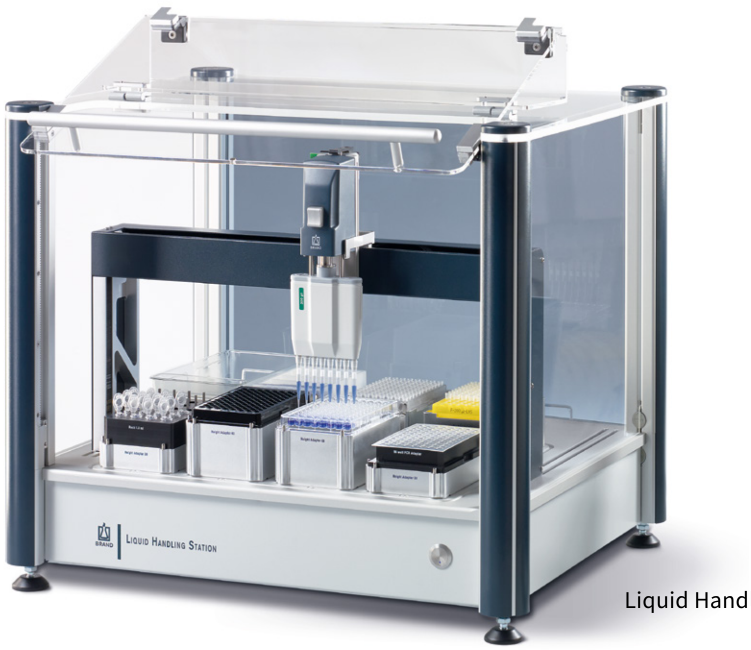


Liquid Handling Station

PRODUCT INFORMATION

BRAND Liquid Handling Station

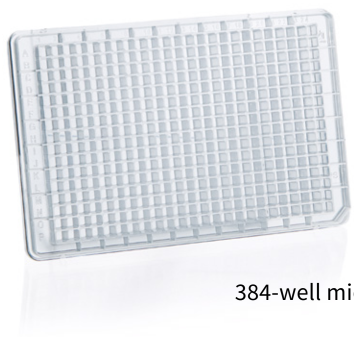
Contamination-free, automatic pipetting into 384-well microplates with the BRAND Liquid Handling Station

Introduction

With the BRAND Liquid Handling Station (LHS), a wide variety of everyday laboratory tasks can be performed automatically, with accurate results. Manually pipetting into 384-well microplates, as is common in high-throughput screening (HTS), is easily susceptible to errors and contamination. The objective of this technical note is to determine the contamination risk for pipetting into a 384-well microplate with the LHS. A common method used to establish this risk is to pipette a measuring solution into a microplate in a checkerboard pattern. Because the measuring solution is missing in every second well, contamination between wells can be measured.

Material and method

Every second well of a 384-well microplate (Cat. No. 781620), beginning with Well A2, is filled in checkerboard pattern with 50 µl of a 1.5% solution of the food coloring Patent Blue V (E131). Next, each empty well is filled with 50 µl of fully deionized (DI) water. The pipetting procedure is carried out once with the 50 µl single-channel liquid end (SC LE) and once with the 50 µl multi-channel liquid end (MC LE). In addition, in another plate, each well is filled with 50 µl of DI water. This plate serves as the negative control. The absorption of all plates is then measured in the Nanoquant Infinite M200 Pro from Tecan at 640 nm. Based on the signal strengths in the wells, in which only DI water had been pipetted, it can then be determined if contamination of the food coloring has taken place.



384-well microplate (781620)

Autor: Daniel Gödde | BRAND GMBH + CO KG, Wertheim

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Results and discussion

Analysis of the negative control shows a mean absorption value of $Ø_{Neg}$ = 0.0381 ± 0.0013. Because the measured values of the negative control are not normally distributed, the critical value, i.e. the value at which contamination can be assumed, is defined as the maximum measured value of the negative control. This value amounts to A_{crit} = 0.0468. This absorption corresponds to a substance quantity of 10.24 pmol and a coloring solution volume of $2.51 \cdot 10^{-3}$ pl.

As shown in Figure 1, no contamination was found in any of the wells filled with water in both 384-well microplates. For the pipetting procedure with the 50 µl SC LE, a maximum absorption of $A_{Max\ SC}$ = 0.0428 was measured, and for the 50 µl MC LE, a maximum absorption of $A_{Max\ MC}$ = 0.0409 was measured.

<>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	0,0373	3,1538	0,0378	3,1695	0,0370	3,0986	0,0400	3,1431	0,0375	3,1559	0,0376	3,0996	0,0375	3,1405	0,0377	3,1252	0,0368	3,1132	0,0373	3,1454	0,0377	3,0963	0,0378	3,0087
B	3,1366	0,0378	3,1083	0,0368	3,0732	0,0377	3,1206	0,0377	3,0990	0,0382	3,0976	0,0376	3,0569	0,0367	3,1512	0,0375	3,1327	0,0398	3,1388	0,0365	3,0804	0,0369	3,1498	0,0377
C	0,0374	3,0646	0,0381	3,1636	0,0375	3,0960	0,0378	3,1364	0,0380	3,0787	0,0379	3,1527	0,0403	3,0517	0,0377	3,1334	0,0369	3,1208	0,0372	3,1327	0,0369	3,0960	0,0375	3,1512
D	3,0520	0,0385	3,1204	0,0378	3,0926	0,0386	3,1329	0,0380	3,1064	0,0383	3,1634	0,0381	3,1214	0,0371	3,0688	0,0375	3,0763	0,0370	3,1355	0,0377	3,0902	0,0376	3,1281	0,0384
E	0,0382	3,0704	0,0380	3,0804	0,0376	3,1346	0,0388	3,1626	0,0379	3,1182	0,0388	3,1188	0,0373	3,0782	0,0376	3,0899	0,0373	3,0755	0,0370	3,1030	0,0374	3,0760	0,0379	3,1162
F	3,0636	0,0387	3,1943	0,0382	3,1162	0,0393	3,1752	0,0389	3,1019	0,0381	3,1157	0,0381	3,0797	0,0378	3,1463	0,0379	3,1477	0,0374	3,1431	0,0376	3,1149	0,0380	3,1277	0,0381
G	0,0396	3,0550	0,0392	3,1020	0,0393	3,1149	0,0396	3,1145	0,0390	3,1165	0,0386	3,1244	0,0385	3,0497	0,0377	3,1448	0,0379	3,0899	0,0377	3,1118	0,0381	3,0878	0,0383	3,1431
H	3,0716	0,0387	3,1284	0,0384	3,1286	0,0393	3,1117	0,0395	3,1112	0,0396	3,1581	0,0397	3,1161	0,0396	3,1156	0,0394	3,0614	0,0395	3,1265	0,0389	3,1700	0,0390	3,1202	0,0394
I	0,0411	3,0690	0,0394	3,1392	0,0401	3,1291	0,0399	3,1248	0,0396	3,0846	0,0394	3,1127	0,0394	3,0938	0,0377	3,2047	0,0391	3,1229	0,0403	3,1277	0,0388	3,0750	0,0394	3,1534
J	3,0484	0,0395	3,1570	0,0387	3,1326	0,0389	3,1437	0,0390	3,0228	0,0382	3,1419	0,0389	3,1111	0,0381	3,1875	0,0388	3,1243	0,0390	3,1539	0,0390	3,1413	0,0395	3,1223	0,0396
K	0,0386	3,0773	0,0390	3,0981	0,0379	3,1536	0,0381	3,1393	0,0406	3,1266	0,0383	3,1420	0,0378	3,0279	0,0381	3,1426	0,0387	3,0687	0,0395	3,1219	0,0384	3,0971	0,0390	3,1127
L	3,0830	0,0390	3,1248	0,0387	3,0816	0,0382	3,1569	0,0382	3,1255	0,0384	3,0374	0,0382	3,0695	0,0389	3,1395	0,0384	3,0905	0,0392	3,1219	0,0397	3,0360	0,0382	3,1044	0,0403
M	0,0388	3,0948	0,0386	3,1854	0,0397	3,0760	0,0380	3,1541	0,0389	3,1123	0,0381	3,1406	0,0391	3,0942	0,0402	3,1702	0,0388	3,1107	0,0394	3,1226	0,0393	3,0930	0,0383	3,1251
N	3,0809	0,0394	3,1259	0,0387	3,1104	0,0415	3,1007	0,0386	3,0967	0,0388	3,1230	0,0384	3,1248	0,0392	3,1101	0,0400	3,1086	0,0385	3,0812	0,0403	3,1493	0,0399	3,1197	0,0387
O	0,0395	3,0899	0,0389	3,1535	0,0380	3,0699	0,0389	3,1344	0,0392	3,1365	0,0385	3,0711	0,0393	3,0875	0,0393	3,1297	0,0385	3,0748	0,0428	3,1092	0,0390	3,0956	0,0411	3,1517
P	3,0064	0,0396	3,0461	0,0394	3,0673	0,0389	3,0818	0,0390	3,0744	0,0395	3,0662	0,0392	3,0455	0,0398	3,1341	0,0409	3,0838	0,0400	3,0942	0,0397	3,0782	0,0401	3,1485	0,0390

<>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	0,0372	3,2006	0,0376	3,2188	0,0367	3,2030	0,0403	3,1748	0,0376	3,1283	0,0372	3,1563	0,0371	3,1735	0,0371	3,1699	0,0370	3,2204	0,0377	3,2213	0,0373	3,1558	0,0381	3,1401
B	3,1520	0,0377	3,2011	0,0369	3,1442	0,0375	3,2353	0,0373	3,1557	0,0373	3,1574	0,0373	3,1394	0,0370	3,2194	0,0376	3,2011	0,0400	3,1711	0,0368	3,1528	0,0377	3,1668	0,0409
C	0,0369	3,1219	0,0373	3,1818	0,0366	3,1544	0,0369	3,2336	0,0375	3,2001	0,0374	3,0956	0,0360	3,1689	0,0367	3,2012	0,0366	3,1517	0,0381	3,1542	0,0369	3,1161	0,0378	3,1992
D	3,1398	0,0374	3,1806	0,0372	3,1963	0,0387	3,2714	0,0372	3,2526	0,0379	3,1805	0,0377	3,1081	0,0368	3,1578	0,0372	3,1365	0,0367	3,2151	0,0375	3,1216	0,0375	3,1590	0,0382
E	0,0368	3,1300	0,0369	3,1796	0,0361	3,2132	0,0374	3,2504	0,0371	3,1814	0,0373	3,1653	0,0363	3,1482	0,0369	3,1697	0,0361	3,1716	0,0361	3,2111	0,0367	3,1977	0,0378	3,1958
F	3,1490	0,0373	3,2118	0,0371	3,2291	0,0376	3,2496	0,0375	3,2466	0,0370	3,2299	0,0375	3,1849	0,0368	3,2113	0,0368	3,1847	0,0366	3,1973	0,0367	3,2130	0,0380	3,1117	0,0381
G	0,0376	3,1142	0,0372	3,2287	0,0378	3,1612	0,0379	3,2095	0,0375	3,1601	0,0372	3,1301	0,0367	3,1464	0,0367	3,1926	0,0366	3,1617	0,0367	3,1755	0,0370	3,1590	0,0389	3,1933
H	3,1456	0,0368	3,1920	0,0370	3,1749	0,0376	3,2268	0,0375	3,1583	0,0378	3,1946	0,0383	3,1313	0,0377	3,2067	0,0376	3,1627	0,0376	3,1653	0,0375	3,1752	0,0382	3,1256	0,0396
I	0,0384	3,2011	0,0388	3,2617	0,0388	3,1607	0,0376	3,1785	0,0379	3,1771	0,0378	3,1925	0,0374	3,1598	0,0364	3,1457	0,0380	3,1752	0,0378	3,1761	0,0374	3,1342	0,0385	3,2082
J	3,1566	0,0378	3,2251	0,0368	3,2255	0,0370	3,1915	0,0373	3,1571	0,0374	3,2442	0,0376	3,1418	0,0374	3,1476	0,0381	3,2094	0,0373	3,2310	0,0372	3,1561	0,0366	3,2032	0,0388
K	0,0371	3,1283	0,0371	3,2440	0,0362	3,1891	0,0368	3,1442	0,0378	3,1875	0,0376	3,1903	0,0361	3,1001	0,0369	3,1742	0,0374	3,2072	0,0396	3,2247	0,0368	3,1304	0,0372	3,2253
L	3,1414	0,0371	3,2274	0,0371	3,1866	0,0366	3,2300	0,0367	3,2093	0,0371	3,1624	0,0365	3,1603	0,0378	3,2407	0,0370	3,1895	0,0377	3,1733	0,0389	3,1876	0,0373	3,1834	0,0388
M	0,0368	3,1833	0,0364	3,1720	0,0375	3,1726	0,0366	3,2068	0,0370	3,2093	0,0366	3,1273	0,0373	3,0997	0,0381	3,2456	0,0368	3,1906	0,0375	3,1921	0,0371	3,2067	0,0367	3,2008
N	3,2058	0,0369	3,1870	0,0368	3,1882	0,0394	3,2202	0,0376	3,1561	0,0370	3,2052	0,0368	3,1405	0,0371	3,2287	0,0378	3,1419	0,0374	3,2603	0,0379	3,1701	0,0383	3,2031	0,0374
O	0,0370	3,2001	0,0369	3,2590	0,0357	3,1730	0,0361	3,1742	0,0372	3,2121	0,0365	3,1400	0,0370	3,1713	0,0373	3,2205	0,0366	3,1692	0,0406	3,2042	0,0369	3,1433	0,0389	3,2058
P	3,1008	0,0373	3,1702	0,0370	3,1252	0,0365	3,1572	0,0370	3,1393	0,0374	3,1152	0,0369	3,1270	0,0373	3,2039	0,0379	3,1550	0,0379	3,2210	0,0372	3,1727	0,0383	3,1842	0,0371

Figure 1
Absorption values at 640 nm of the microplates that were pipetted with the 50 µl SC LE (top) and 50 µl MC LE (bottom). All values greater than the critical value A_{crit} = 0.0468 were marked in red.

Conclusion

Pipetting with the LHS into a 384-well microplate showed no errors and no contaminations with both a single-channel LE and a multichannel LE. Therefore, the LHS is suitable for sensitive samples during HTS.

BRAND GMBH + CO KG
P.O. Box 1155 | 97861 Wertheim | Germany
T +49 9342 808 0 | F +49 9342 808 98000 | info@brand.de | www.brand.de

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BRAND (Shanghai) Trading Co., Ltd.
Shanghai, China

Tel.: +86 21 6422 2318
info@brand.com.cn
www.brand.cn.com

BRAND Scientific Equipment Pvt. Ltd.
Mumbai, India

Tel.: +91 22 42957790
customersupport@brand.co.in
www.brand.co.in

BrandTech® Scientific, Inc.
Essex, CT. United States of America

Tel.: +1 860 767 2562
info@brandtech.com
www.brandtech.com

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