



Certification of the USP Moisture Permeation Test

Prepared for:

Health Care Logistics
450 Town Street
Circleville, Ohio 43113-0025

Objective:

To quantify moisture permeation, according to the USP Standards, for the **HCL #7017 Class A 1-Year Dating Micro Blister with HCL# 6027 Class A 1-Year Dating Micro Laser Label – Lot # S122315** of Health Care Logistics

Summary:

Ten sample blisters were packaged with dried desiccant tablets and sealed using moderate force with a sealing roller on a foam tray with pre-formed compartments. Ten empty blisters served as the control. All blisters were placed in a temperature and humidity controlled environment; taken out to equalize to room temperature and weighed on an electronic balance per USP Testing Standard Method I from Section <671> Containers-Permeation. Testing was performed for a 30-day duration. The following formula for moisture permeation was used to calculate the mg gained per day:

$$\text{Moisture Permeation} = (1/N) [W_f - W_i] - (C_f - C_i)$$

Results:

For the 30 day testing program, this package configuration was effective in preventing moisture permeation and meets the parameters provided by the USP to warrant a "Class A" package classification.

Tested by:
DevelopMed Ltd.

A handwritten signature in black ink that reads 'Kenneth F. Bober'.

Kenneth F. Bober, R.Ph.
President

USP Package Testing May/June 2015
 Blister: HCL#7017 Class A 1-Yr Dating Micro Blister
 Lidding:HCL#:6027-Class A 1-Yr Dating Micro Label - Lot #: S122315

Test Pkg		12-May	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	25-May	29-May	2-Jun	6-Jun	10-Jun
Initial Wt.																
1		0.6100	0.6130	0.6130	0.6130	0.6140	0.6150	0.6140	0.6140	0.6140	0.6140	0.6160	0.6180	0.6180	0.6180	0.6180
2		0.6320	0.6350	0.6360	0.6360	0.6360	0.6360	0.6360	0.6360	0.6360	0.6360	0.6380	0.6400	0.6400	0.6400	0.6400
3		0.6120	0.6150	0.6150	0.6150	0.6160	0.6160	0.6160	0.6160	0.6160	0.6160	0.6180	0.6200	0.6200	0.6200	0.6200
4		0.6130	0.6170	0.6170	0.6170	0.6180	0.6180	0.6180	0.6180	0.6180	0.6180	0.6200	0.6220	0.6220	0.6220	0.6220
5		0.6350	0.6390	0.6390	0.6390	0.6400	0.6410	0.6410	0.6410	0.6400	0.6400	0.6430	0.6450	0.6450	0.6450	0.6450
6		0.6160	0.6200	0.6210	0.6210	0.6220	0.6220	0.6220	0.6220	0.6220	0.6220	0.6240	0.6250	0.6250	0.6250	0.6250
7		0.6450	0.6480	0.6480	0.6490	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6520	0.6540	0.6540	0.6530	0.6540
8		0.6330	0.6360	0.6360	0.6370	0.6380	0.6380	0.6380	0.6380	0.6380	0.6380	0.6410	0.6420	0.6420	0.6420	0.6420
9		0.6220	0.6260	0.6260	0.6260	0.6270	0.6280	0.6280	0.6280	0.6280	0.6280	0.6300	0.6320	0.6310	0.6310	0.6310
10		0.6320	0.6360	0.6360	0.6360	0.6370	0.6370	0.6370	0.6370	0.6370	0.6370	0.6390	0.6410	0.6410	0.6410	0.6410

Control		12-May	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	25-May	29-May	2-Jun	6-Jun	10-Jun
Initial Wt.																
1		0.5100	0.5140	0.5150	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5160	0.5160	0.5160	0.5160	0.5160
2		0.5030	0.5080	0.5090	0.5090	0.5090	0.5090	0.5090	0.5090	0.5090	0.5090	0.5110	0.5110	0.5110	0.5110	0.5110
3		0.5070	0.5110	0.5120	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5130	0.5130	0.5120	0.5120	0.5120
4		0.5100	0.5140	0.5150	0.5140	0.5150	0.5150	0.5150	0.5150	0.5150	0.5150	0.5160	0.5170	0.5170	0.5170	0.5170
5		0.5130	0.5180	0.5180	0.5180	0.5180	0.5180	0.5180	0.5180	0.5180	0.5180	0.5200	0.5200	0.5190	0.5190	0.5180
6		0.5070	0.5110	0.5120	0.5110	0.5120	0.5120	0.5120	0.5120	0.5120	0.5120	0.5130	0.5140	0.5140	0.5140	0.5140
7		0.5070	0.5120	0.5120	0.5120	0.5120	0.5120	0.5120	0.5120	0.5120	0.5120	0.5140	0.5150	0.5140	0.5140	0.5140
8		0.5090	0.5130	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5160	0.5170	0.5160	0.5160	0.5160
9		0.5090	0.5130	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5140	0.5150	0.5150	0.5140	0.5140	0.5140
10		0.5070	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5110	0.5120	0.5120	0.5110	0.5110	0.5110
Sum		5.0820	5.1250	5.1320	5.1280	5.1300	5.1300	5.1300	5.1300	5.1300	5.1300	5.1460	5.1500	5.1440	5.1440	5.1430
Ave		0.5082	0.5125	0.5132	0.5128	0.5130	0.5130	0.5130	0.5130	0.5130	0.5130	0.5146	0.5150	0.5144	0.5144	0.5143

USP Package Testing May/June 2015

Blister: HCL#7017 Class A 1-Yr Dating Micro Blister

Lidding:HCL#:6027-Class A 1-Yr Dating Micro Label - Lot #: S122315 (Wt. E xpressed in Grams) (Moisture Gain expressed in milligrams)

DAY OF TEST	DATE	CONTROL WEIGHT (GMS)	CONTROL AVG WEIGHT (GMS)	CONTROL (Cf-Ci) WT	S-1 TEST	DIFF =	PER DAY MOIST, GAIN (Mg)	S-2 TEST	DIFF =	PER DAY MOIST, GAIN (Mg)	S-3 TEST	DIFF =	PER DAY MOIST, GAIN (Mg)	S-4 TEST	DIFF =	PER DAY MOIST, GAIN (Mg)	S-5 TEST	DIFF =	PER DAY MOIST, GAIN (Mg)
1	5/12/2015	5.0820	5.0820	0.5082	0.6100	++++++	0.6320	0.6320	++++++	0.6120	0.6120	++++++	0.6130	0.6130	++++++	0.6350	0.6350	++++++	0.6350
2	5/13/2015	5.1250	5.1250	0.5125	0.6130	0.0000	0.00	0.6350	0.0000	0.00	0.6150	0.0000	0.00	0.6170	0.0000	0.00	0.6390	0.0000	0.00
3	5/14/2015	5.1320	5.1320	0.5132	0.6130	0.0000	-0.23	0.6360	0.0010	0.10	0.6150	0.0000	-0.23	0.6170	0.0000	-0.23	0.6390	0.0000	-0.23
4	5/15/2015	5.1280	5.1280	0.5128	0.6130	0.0000	-0.08	0.6360	0.0010	0.17	0.6150	0.0000	-0.08	0.6170	0.0000	-0.08	0.6390	0.0000	-0.08
5	5/16/2015	5.1300	5.1300	0.5130	0.6140	0.0010	0.10	0.6360	0.0010	0.10	0.6160	0.0010	0.10	0.6180	0.0010	0.10	0.6400	0.0010	0.10
6	5/17/2015	5.1300	5.1300	0.5130	0.6150	0.0020	0.25	0.6360	0.0010	0.08	0.6160	0.0010	0.08	0.6180	0.0010	0.08	0.6410	0.0020	0.25
7	5/18/2015	5.1300	5.1300	0.5130	0.6140	0.0010	0.07	0.6360	0.0010	0.07	0.6160	0.0010	0.07	0.6180	0.0010	0.07	0.6410	0.0020	0.21
8	5/19/2015	5.1300	5.1300	0.5130	0.6140	0.0010	0.06	0.6360	0.0010	0.06	0.6160	0.0010	0.06	0.6180	0.0010	0.06	0.6410	0.0020	0.19
9	5/20/2015	5.1300	5.1300	0.5130	0.6140	0.0010	0.06	0.6360	0.0010	0.06	0.6160	0.0010	0.06	0.6180	0.0010	0.06	0.6400	0.0010	0.06
10	5/21/2015	5.1300	5.1300	0.5130	0.6140	0.0010	0.05	0.6360	0.0010	0.05	0.6160	0.0010	0.05	0.6180	0.0010	0.05	0.6400	0.0010	0.05
14	5/25/2015	5.1460	5.1460	0.5146	0.6160	0.0030	0.06	0.6380	0.0030	0.06	0.6180	0.0030	0.06	0.6200	0.0030	0.06	0.6430	0.0040	0.14
18	5/29/2015	5.1500	5.1500	0.5150	0.6180	0.0050	0.14	0.6400	0.0050	0.14	0.6200	0.0050	0.14	0.6220	0.0050	0.14	0.6450	0.0060	0.19
22	6/2/2015	5.1440	5.1440	0.5144	0.6180	0.0050	0.14	0.6400	0.0050	0.14	0.6200	0.0050	0.14	0.6220	0.0050	0.14	0.6450	0.0060	0.19
26	6/6/2015	5.1440	5.1440	0.5144	0.6180	0.0050	0.12	0.6400	0.0050	0.12	0.6200	0.0050	0.12	0.6220	0.0050	0.12	0.6450	0.0060	0.16
30	6/10/2015	5.1430	5.1430	0.5143	0.6180	0.0050	0.11	0.6400	0.0050	0.11	0.6200	0.0050	0.11	0.6220	0.0050	0.11	0.6450	0.0060	0.14

S-6 TEST	WT	DIFF =	PER DAY MOIST, GAIN (Mg)	S-7 TEST	WT	DIFF =	PER DAY MOIST, GAIN (Mg)	S-8 TEST	WT	DIFF =	PER DAY MOIST, GAIN (Mg)	S-9 TEST	WT	DIFF =	PER DAY MOIST, GAIN (Mg)	S-10 TEST	WT	DIFF =	PER DAY MOIST, GAIN (Mg)
0.6160	0.6160	++++++	0.6450	0.6450	0.6330	++++++	0.6220	0.6330	0.6220	++++++	0.6320	0.6220	0.6320	++++++	0.6320	0.6320	0.6320	++++++	0.6320
0.6200	0.6200	0.0000	0.00	0.6480	0.6360	0.0000	0.00	0.6360	0.6260	0.0000	0.00	0.6260	0.6360	0.0000	0.00	0.6360	0.6360	0.0000	0.00
0.6210	0.6210	0.0010	0.10	0.6480	0.6360	0.0000	-0.23	0.6360	0.6260	0.0000	-0.23	0.6260	0.6360	0.0000	-0.23	0.6360	0.6360	0.0000	-0.23
0.6210	0.6210	0.0010	0.17	0.6490	0.6370	0.0010	0.17	0.6370	0.6260	0.0010	0.17	0.6260	0.6370	0.0000	-0.08	0.6370	0.6370	0.0000	-0.08
0.6220	0.6220	0.0020	0.30	0.6500	0.6380	0.0020	0.30	0.6380	0.6270	0.0010	0.30	0.6270	0.6380	0.0010	0.10	0.6370	0.6370	0.0010	0.10
0.6220	0.6220	0.0020	0.25	0.6500	0.6380	0.0020	0.25	0.6380	0.6280	0.0020	0.25	0.6280	0.6380	0.0020	0.08	0.6370	0.6370	0.0020	0.08
0.6220	0.6220	0.0020	0.21	0.6500	0.6380	0.0020	0.21	0.6380	0.6280	0.0020	0.21	0.6280	0.6380	0.0020	0.07	0.6370	0.6370	0.0020	0.07
0.6220	0.6220	0.0020	0.19	0.6500	0.6380	0.0020	0.19	0.6380	0.6280	0.0020	0.19	0.6280	0.6380	0.0020	0.06	0.6370	0.6370	0.0020	0.06
0.6220	0.6220	0.0020	0.17	0.6500	0.6380	0.0020	0.17	0.6380	0.6280	0.0020	0.17	0.6280	0.6380	0.0020	0.06	0.6370	0.6370	0.0020	0.06
0.6220	0.6220	0.0020	0.15	0.6500	0.6380	0.0020	0.15	0.6380	0.6280	0.0020	0.15	0.6280	0.6380	0.0020	0.05	0.6370	0.6370	0.0020	0.05
0.6240	0.6240	0.0040	0.14	0.6520	0.6410	0.0040	0.14	0.6410	0.6300	0.0040	0.14	0.6300	0.6410	0.0030	0.06	0.6390	0.6390	0.0030	0.06
0.6250	0.6250	0.0050	0.14	0.6540	0.6420	0.0060	0.19	0.6420	0.6320	0.0060	0.19	0.6320	0.6420	0.0050	0.14	0.6410	0.6410	0.0050	0.14
0.6250	0.6250	0.0050	0.14	0.6540	0.6420	0.0060	0.19	0.6420	0.6310	0.0060	0.19	0.6310	0.6420	0.0050	0.14	0.6410	0.6410	0.0050	0.14
0.6250	0.6250	0.0050	0.12	0.6530	0.6420	0.0060	0.12	0.6420	0.6310	0.0060	0.12	0.6310	0.6420	0.0050	0.12	0.6410	0.6410	0.0050	0.12
0.6250	0.6250	0.0050	0.11	0.6540	0.6420	0.0060	0.14	0.6420	0.6310	0.0060	0.14	0.6310	0.6420	0.0050	0.11	0.6410	0.6410	0.0050	0.11