

# Comparison Study Report

## CUBE and smart 700

---

### **Study Purpose**

This study was performed to show the technical equality of the new CUBE laboratory photometer and the well-established smart 700 laboratory photometer. In this case the term technical equality covers the whole measurement system including optical unit and calculation unit.

---

### **Summary and Conclusion**

The number of 111 CUBE laboratory photometers and the same number of smart 700 laboratory photometers were taken to measure 6 tools with different absorption glasses. The optical densities (absorptions) of these glasses are well distributed over the whole measurement range. CUBE and smart 700 are both operating with a wavelength of 700 nm. To compare the two named measurement systems a linear regression was used. The result was a linear regression line with a coefficient of determination  $R^2 = 0.99997$ , a slope  $k = 0.99973$  and an offset  $d = 0.07961$ . This result leads to the conclusion that the two systems are technically equal. All test-parameter-specific studies performed on smart 700 can be used for Eurolyser CUBE without restrictions.

---

### **Location**

Location: Eurolyser Diagnostica GmbH  
Operator: F. Keller  
Date: January 2014

---

### **Equipment**

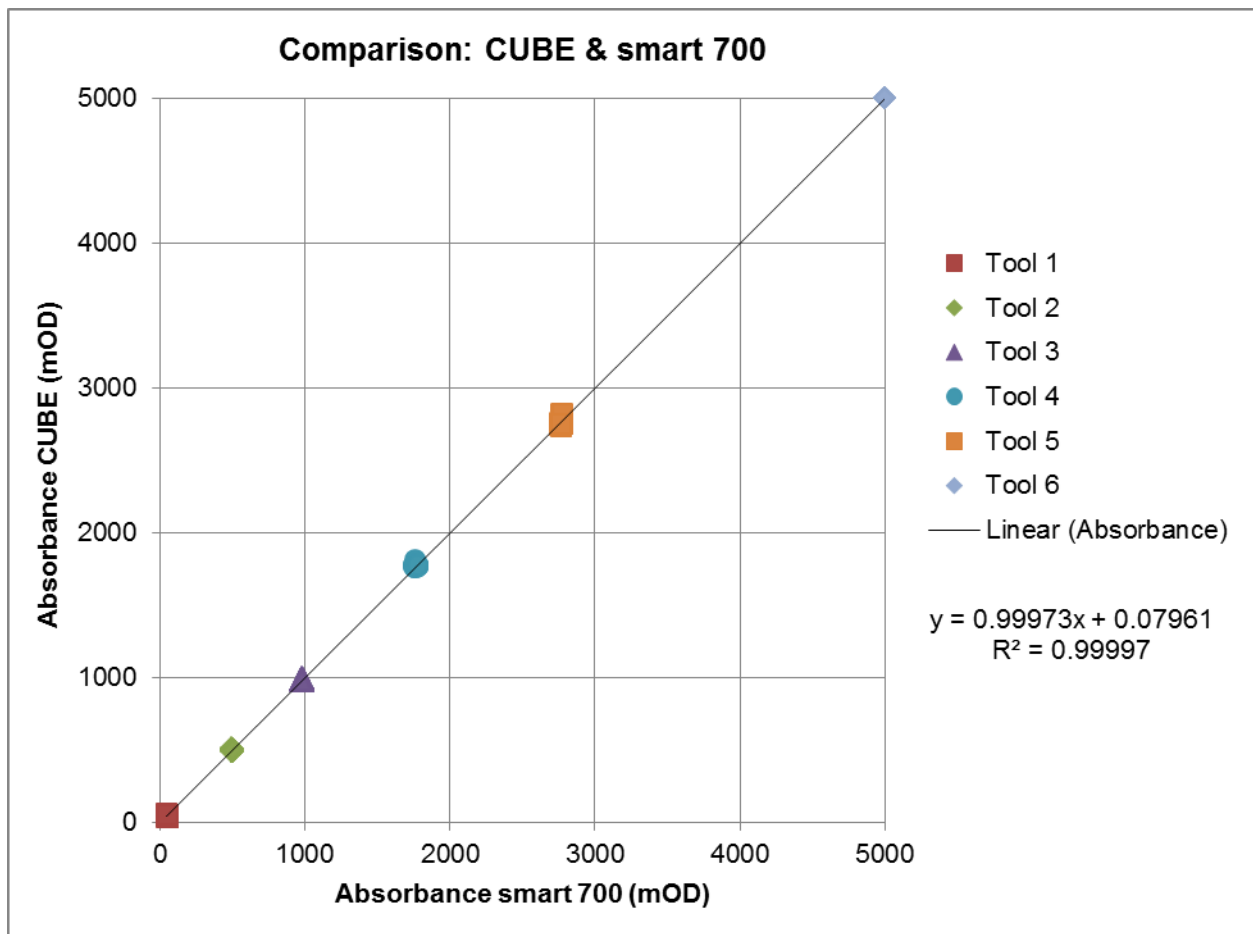
- 111 pcs. Eurolyser CUBE
  - 111 pcs. Eurolyser smart 700
  - Eurolyser Test Tool Kit
- 



Eurolyser Diagnostica GmbH  
Bayernstraße 11a  
5020 Salzburg, AUSTRIA

Tel: +43 662 432100  
Fax: +43 662 432100 50

# 1. Linear Regression



# 2. Data smart 700

smart 700		Absorbance					
Tool	Device	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5	Tool 6
Unit	Serial nr.	mOD	mOD	mOD	mOD	mOD	mOD
001	Bc14459	50.0	500.0	980.0	1763.0	2764.0	5000.0
002	Bc14460	51.0	501.0	986.0	1767.0	2765.0	5000.0
003	Bc14461	51.0	500.0	987.0	1770.0	2764.0	5000.0
004	Bc14462	51.0	500.0	984.0	1762.0	2764.0	5000.0
005	Bc14463	51.0	500.0	981.0	1761.0	2764.0	5000.0
006	Bc14464	51.0	499.0	980.0	1756.0	2762.0	5000.0
007	Bc14465	51.0	502.0	980.0	1762.0	2762.0	5000.0
008	Bc14466	50.0	500.0	980.0	1760.0	2762.0	5000.0
009	Bc14467	50.0	500.0	981.0	1761.0	2762.0	5000.0
010	Bc14468	51.0	501.0	984.0	1761.0	2762.0	5000.0
011	Bc14469	51.0	500.0	979.0	1761.0	2762.0	5000.0
012	Bc14470	50.0	496.0	973.0	1755.0	2762.0	5000.0
013	Bc14471	51.0	501.0	976.0	1758.0	2762.0	5000.0
014	Bc14472	50.0	501.0	977.0	1758.0	2762.0	5000.0
015	Bc14473	49.0	498.0	983.0	1762.0	2762.0	5000.0
016	Bc14474	51.0	501.0	977.0	1757.0	2761.0	5000.0
017	Bc14475	51.0	500.0	980.0	1762.0	2761.0	5000.0

018	Bc14476	50.0	502.0	982.0	1760.0	2761.0	5000.0
019	Bc14477	51.0	501.0	986.0	1768.0	2764.0	5000.0
020	Bc14478	51.0	500.0	978.0	1761.0	2761.0	5000.0
021	Bc14479	51.0	501.0	982.0	1762.0	2761.0	5000.0
022	Bc14480	53.0	502.0	987.0	1768.0	2764.0	5000.0
023	Bc14481	51.0	501.0	980.0	1760.0	2762.0	5000.0
024	Bc14482	50.0	501.0	982.0	1766.0	2762.0	5000.0
025	Bc14483	51.0	501.0	980.0	1762.0	2762.0	5000.0
026	Bc14484	49.0	495.0	983.0	1760.0	2762.0	5000.0
027	Bc14485	51.0	500.0	981.0	1763.0	2762.0	5000.0
028	Bc14486	50.0	500.0	980.0	1762.0	2762.0	5000.0
029	Bc14487	50.0	501.0	980.0	1750.0	2762.0	5000.0
030	Bc14488	50.0	501.0	983.0	1764.0	2762.0	5000.0
031	Bc14489	51.0	500.0	978.0	1753.0	2762.0	5000.0
032	Bc14490	50.0	500.0	980.0	1762.0	2762.0	5000.0
033	Bc14491	52.0	502.0	988.0	1762.0	2764.0	5000.0
034	Bc14492	50.0	501.0	982.0	1762.0	2762.0	5000.0
035	Bc14493	51.0	502.0	983.0	1766.0	2762.0	5000.0
036	Bc14494	50.0	500.0	978.0	1762.0	2762.0	5000.0
037	Bc14495	53.0	495.0	980.0	1761.0	2762.0	5000.0
038	Bc14496	51.0	500.0	985.0	1765.0	2762.0	5000.0
039	Bc14497	50.0	501.0	981.0	1758.0	2762.0	5000.0
040	Bc14498	49.0	499.0	974.0	1760.0	2762.0	5000.0
041	Bc14499	50.0	500.0	981.0	1761.0	2762.0	5000.0
042	Bc14500	51.0	500.0	980.0	1758.0	2762.0	5000.0
043	Bc14501	50.0	499.0	980.0	1762.0	2762.0	5000.0
044	Bc14502	50.0	499.0	983.0	1762.0	2762.0	5000.0
045	Bc14503	51.0	500.0	980.0	1761.0	2762.0	5000.0
046	Bc14504	51.0	501.0	987.0	1766.0	2765.0	5000.0
047	Bc14505	50.0	500.0	985.0	1766.0	2764.0	5000.0
048	Bc14506	49.0	500.0	982.0	1763.0	2762.0	5000.0
049	Bc14507	50.0	498.0	981.0	1757.0	2762.0	5000.0
050	Bc14508	51.0	501.0	984.0	1767.0	2762.0	5000.0
051	Bc14509	51.0	501.0	978.0	1762.0	2762.0	5000.0
052	Bc14510	50.0	499.0	990.0	1766.0	2768.0	5000.0
053	Bc14511	51.0	501.0	986.0	1766.0	2764.0	5000.0
054	Bc14512	50.0	502.0	982.0	1764.0	2762.0	5000.0
055	Bc14513	50.0	499.0	982.0	1758.0	2762.0	5000.0
056	Bc14514	50.0	501.0	981.0	1767.0	2762.0	5000.0
057	Bc14515	51.8	501.0	990.0	1765.0	2767.0	5000.0
058	Bc14516	51.0	501.0	984.0	1772.0	2764.0	5000.0
059	Bc14517	51.0	500.0	988.0	1766.0	2764.0	5000.0
060	Bc14518	50.0	500.0	987.0	1762.0	2764.0	5000.0
061	Bc14519	52.0	502.0	982.0	1762.0	2762.0	5000.0
062	Bc14520	51.0	502.0	987.0	1753.0	2766.0	5000.0
063	Bc14521	50.0	500.0	986.0	1762.0	2764.0	5000.0
064	Bc14522	51.0	500.0	980.0	1758.0	2762.0	5000.0
065	Bc14523	51.0	499.0	985.0	1762.0	2762.0	5000.0
066	Bc14524	51.0	501.0	989.0	1766.0	2768.0	5000.0
067	Bc14525	50.0	501.0	989.0	1754.0	2766.0	5000.0
068	Bc14526	50.8	501.0	988.0	1765.0	2767.0	5000.0
069	Bc14527	51.0	502.0	985.0	1766.0	2764.0	5000.0
070	Bc14528	51.0	501.0	985.0	1770.0	2764.0	5000.0
071	Bc14529	50.0	501.0	987.0	1763.0	2768.0	5000.0
072	Bc14530	50.9	501.0	991.0	1767.0	2771.0	5000.0
073	Bc14531	51.0	502.0	981.0	1767.0	2764.0	5000.0
074	Bc14532	50.8	501.0	990.0	1763.0	2770.0	5000.0
075	Bc14533	51.0	500.0	990.0	1758.0	2766.0	5000.0

076	Bc14534	51.0	501.0	992.0	1765.0	2771.0	5000.0
077	Bc14535	51.0	501.0	992.0	1763.0	2771.0	5000.0
078	Bc14536	52.0	501.0	982.0	1770.0	2764.0	5000.0
079	Bc14537	51.0	501.0	985.0	1767.0	2764.0	5000.0
080	Bc14538	51.0	501.0	983.0	1763.0	2762.0	5000.0
081	Bc14539	51.8	501.0	988.0	1767.0	2765.0	5000.0
082	Bc14540	51.0	501.0	984.0	1762.0	2762.0	5000.0
083	Bc14541	51.0	500.0	990.0	1766.0	2768.0	5000.0
084	Bc14542	51.0	501.0	982.0	1762.0	2764.0	5000.0
085	Bc14543	52.0	501.0	986.0	1761.0	2764.0	5000.0
086	Bc14544	51.7	500.0	990.0	1766.0	2766.0	5000.0
087	Bc14545	50.1	501.0	986.0	1764.0	2767.0	5000.0
088	Bc14546	49.5	499.0	984.0	1758.0	2764.0	5000.0
089	Bc14547	48.6	499.0	981.0	1761.0	2762.0	5000.0
090	Bc14548	50.3	499.0	984.0	1762.0	2766.0	5000.0
091	Bc14549	47.8	498.0	982.0	1761.0	2762.0	5000.0
092	Bc14550	48.6	500.0	982.0	1766.0	2766.0	5000.0
093	Bc14551	49.6	498.0	986.0	1763.0	2764.0	5000.0
094	Bc14552	51.3	499.0	986.0	1768.0	2762.0	5000.0
095	Bc14553	48.7	498.0	982.0	1765.0	2762.0	5000.0
096	Bc14554	49.1	499.0	984.0	1762.0	2762.0	5000.0
097	Bc14555	49.0	498.0	986.0	1765.0	2767.0	5000.0
098	Bc14556	49.4	499.0	988.0	1767.0	2768.0	5000.0
099	Bc14557	49.8	497.0	984.0	1767.0	2764.0	5000.0
100	Bc14558	50.4	499.0	988.0	1761.0	2762.0	5000.0
101	Bc14559	49.9	498.0	985.0	1763.0	2762.0	5000.0
102	Bc14560	50.0	497.0	985.0	1766.0	2764.0	5000.0
103	Bc14561	49.1	498.0	979.0	1758.0	2758.0	5000.0
104	Bc14562	49.9	499.0	986.0	1766.0	2764.0	5000.0
105	Bc14563	48.6	499.0	984.0	1763.0	2762.0	5000.0
106	Bc14984	48.0	501.0	978.0	1778.0	2766.0	5000.0
107	Bc14985	51.0	502.0	980.0	1780.0	2763.0	5000.0
108	Bc14986	50.0	501.0	981.0	1781.0	2764.0	5000.0
109	Bc14987	51.0	502.0	982.0	1778.0	2764.0	5000.0
110	Bc14988	51.0	502.0	981.0	1775.0	2766.0	5000.0
111	Bc14989	53.0	502.0	981.0	1779.0	2766.0	5000.0
Mean	overall	50.5	500.1	983.3	1763.5	2763.6	5000.0

### 3. Data CUBE

CUBE (700)		Absorbance					
Tool	Device	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5	Tool 6
Unit	Serial nr.	mOD	mOD	mOD	mOD	mOD	mOD
001	Ca10501	50.8	499.5	981.7	1769.0	2753.7	5000.0
002	Ca10502	48.9	499.2	986.6	1779.0	2785.4	5000.0
003	Ca10503	51.4	499.3	982.7	1768.9	2766.4	5000.0
004	Ca10504	51.5	498.4	982.7	1766.0	2746.8	5000.0
005	Ca10505	51.1	496.9	978.8	1767.7	2779.9	5000.0
006	Ca10506	50.3	498.8	983.1	1770.3	2755.5	5000.0
007	Ca10507	51.6	498.7	982.5	1768.7	2758.6	5000.0
008	Ca10508	50.3	498.1	990.0	1770.9	2754.0	5000.0
009	Ca10509	50.9	499.5	986.4	1771.0	2759.3	5000.0
010	Ca10511	51.4	497.7	981.4	1766.2	2805.0	5000.0
011	Ca10512	51.4	499.2	982.4	1815.1	2754.4	5000.0
012	Ca10513	50.2	499.3	985.2	1774.4	2758.3	5000.0
013	Ca10514	52.1	501.8	985.3	1774.4	2758.9	5000.0

014	Ca10515	50.1	496.3	977.0	1763.9	2742.2	5000.0
015	Ca10516	50.7	498.3	981.7	1767.7	2749.0	5000.0
016	Ca10517	51.2	500.5	985.6	1773.6	2757.8	5000.0
017	Ca10518	51.1	497.5	977.1	1762.1	2744.8	5000.0
018	Ca10519	52.0	499.6	983.9	1772.1	2753.0	5000.0
019	Ca10520	52.1	500.1	983.1	1769.3	2750.8	5000.0
020	Ca10521	49.7	498.5	981.1	1769.1	2753.0	5000.0
021	Ca10522	48.5	498.9	981.7	1769.5	2748.5	5000.0
022	Ca10523	50.1	498.6	981.9	1779.4	2751.4	5000.0
023	Ca10524	48.0	497.7	981.6	1770.4	2750.6	5000.0
024	Ca10525	49.6	498.4	982.5	1771.0	2749.1	5000.0
025	Ca10526	39.9	487.6	977.7	1768.8	2788.9	5000.0
026	Ca10527	47.6	497.7	984.5	1772.9	2749.4	5000.0
027	Ca10528	49.0	497.6	980.4	1771.7	2776.7	5000.0
028	Ca10529	50.3	494.7	981.5	1776.3	2815.1	5000.0
029	Ca10530	46.2	494.6	982.2	1773.6	2821.6	5000.0
030	Ca10531	40.0	488.1	977.1	1769.2	2776.6	5000.0
031	Ca10532	36.2	489.0	977.4	1767.9	2792.6	5000.0
032	Ca10534	50.0	498.1	981.4	1775.4	2776.2	5000.0
033	Ca10535	38.3	487.9	973.3	1769.7	2806.3	5000.0
034	Ca10536	48.6	497.8	981.1	1766.8	2748.7	5000.0
035	Ca10537	48.7	498.9	984.5	1774.9	2775.1	5000.0
036	Ca10538	44.5	494.1	980.1	1768.2	2748.7	5000.0
037	Ca10539	47.1	495.5	979.8	1769.7	2759.4	5000.0
038	Ca10542	57.2	510.9	996.4	1783.3	2764.7	5000.0
039	Ca10543	58.3	508.2	993.4	1784.8	2764.3	5000.0
040	Ca10544	49.9	500.6	984.7	1777.1	2756.5	5000.0
041	Ca10545	48.8	498.8	986.0	1772.0	2747.4	5000.0
042	Ca10546	51.2	501.8	983.8	1777.1	2750.4	5000.0
043	Ca10547	51.3	500.0	984.5	1778.3	2752.6	5000.0
044	Ca10548	49.9	498.8	984.6	1775.8	2746.6	5000.0
045	Ca10549	50.0	498.8	984.1	1771.7	2755.0	5000.0
046	Ca10550	42.1	490.8	976.5	1769.1	2744.3	5000.0
047	Ca10551	51.0	500.2	985.9	1772.6	2756.4	5000.0
048	Ca10551	51.0	499.4	987.3	1775.1	2752.2	5000.0
049	Ca10552	47.0	496.4	980.0	1770.1	2744.0	5000.0
050	Ca10553	49.4	498.3	983.9	1770.6	2751.7	5000.0
051	Ca10554	49.3	498.6	982.4	1775.6	2752.7	5000.0
052	Ca10555	50.5	498.6	982.5	1766.9	2735.5	5000.0
053	Ca10556	49.0	498.0	983.9	1770.7	2748.6	5000.0
054	Ca10557	49.1	497.8	982.3	1768.5	2747.6	5000.0
055	Ca10558	48.8	498.1	980.8	1769.7	2748.1	5000.0
056	Ca10559	54.1	499.5	982.5	1769.3	2749.6	5000.0
057	Ca10560	50.3	500.5	982.5	1768.7	2750.2	5000.0
058	Ca10561	48.9	497.7	980.0	1771.5	2747.1	5000.0
059	Ca12445	51.2	500.6	986.3	1772.4	2750.0	5000.0
060	Ca10563	49.3	497.9	981.8	1768.6	2747.0	5000.0
061	Ca10564	49.7	498.6	981.9	1769.8	2749.7	5000.0
062	Ca10565	49.4	499.8	985.4	1773.0	2753.3	5000.0
063	Ca10566	50.1	499.6	984.4	1772.3	2748.1	5000.0
064	Ca10567	47.9	497.4	983.4	1771.4	2749.2	5000.0
065	Ca10568	50.0	503.6	986.4	1773.8	2756.0	5000.0
066	Ca10569	50.0	498.2	981.7	1768.9	2746.8	5000.0
067	Ca10570	50.4	498.9	983.0	1778.1	2749.0	5000.0
068	Ca10571	50.3	501.7	987.4	1775.1	2749.2	5000.0
069	Ca10572	49.9	500.2	986.8	1775.0	2751.2	5000.0
070	Ca10573	50.9	500.0	987.4	1770.7	2748.2	5000.0
071	Ca10574	49.9	498.2	983.2	1768.3	2744.4	5000.0

072	Ca10575	48.8	497.7	982.3	1771.8	2746.6	5000.0
073	Ca10576	51.2	498.3	981.3	1769.0	2745.9	5000.0
074	Ca10577	49.9	497.7	980.9	1775.7	2746.5	5000.0
075	Ca10578	51.9	501.8	986.4	1775.2	2754.0	5000.0
076	Ca10579	51.2	499.3	982.2	1770.1	2748.6	5000.0
077	Ca10580	49.5	499.1	983.5	1773.8	2817.8	5000.0
078	Ca10581	50.9	500.3	983.1	1769.9	2743.4	5000.0
079	Ca10582	49.7	498.6	981.8	1768.4	2747.3	5000.0
080	Ca10583	48.3	498.7	988.9	1770.6	2747.1	5000.0
081	Ca10584	50.1	499.8	984.4	1770.0	2747.4	5000.0
082	Ca10585	49.7	499.0	982.6	1774.5	2748.5	5000.0
083	Ca10586	51.2	499.5	985.8	1774.3	2748.9	5000.0
084	Ca10587	50.8	500.3	984.0	1773.3	2749.5	5000.0
085	Ca10588	48.5	497.9	978.5	1767.4	2746.5	5000.0
086	Ca10589	49.1	498.2	982.1	1768.3	2742.2	5000.0
087	Ca10590	50.1	499.3	982.3	1769.8	2746.2	5000.0
088	Ca10591	49.8	499.2	984.8	1771.3	2746.5	5000.0
089	Ca10592	49.0	498.1	982.6	1768.9	2744.3	5000.0
090	Ca10593	50.0	499.8	982.8	1771.9	2749.1	5000.0
091	Ca10594	50.2	499.1	982.3	1769.5	2747.7	5000.0
092	Ca10595	49.8	499.0	981.8	1770.3	2746.6	5000.0
093	Ca10596	49.1	498.3	981.0	1770.5	2746.3	5000.0
094	Ca10597	48.5	497.0	981.1	1771.5	2744.2	5000.0
095	Ca10598	49.7	499.2	983.7	1772.2	2750.5	5000.0
096	Ca10599	49.0	498.6	982.4	1771.8	2747.8	5000.0
097	Ca10600	49.4	498.0	981.7	1773.8	2747.0	5000.0
098	Ca10601	49.6	499.4	983.3	1772.6	2750.0	5000.0
099	Ca10602	50.6	499.1	983.4	1770.4	2746.9	5000.0
100	Ca10603	48.8	497.8	981.6	1779.2	2747.8	5000.0
101	Ca10604	50.5	499.6	982.1	1776.8	2749.3	5000.0
102	Ca10605	48.9	497.4	980.5	1772.2	2748.2	5000.0
103	Ca10606	50.2	498.1	981.8	1769.8	2750.6	5000.0
104	Ca10607	50.3	502.6	985.4	1777.6	2750.8	5000.0
105	Ca10608	49.9	499.2	983.0	1774.4	2750.7	5000.0
106	Ca10609	62.2	486.5	975.2	1768.5	2746.3	5000.0
107	Ca10610	51.5	505.9	984.3	1773.3	2749.2	5000.0
108	Ca10612	49.6	498.9	981.9	1779.8	2751.5	5000.0
109	Ca10613	49.7	497.8	986.0	1770.7	2749.6	5000.0
110	Ca10614	49.4	498.4	984.0	1775.3	2749.0	5000.0
111	Ca10615	50.3	499.1	984.1	1778.6	2751.0	5000.0
Mean	overall	49.7	498.5	982.9	1772.3	2755.1	5000.0