



CERTIFICATE OF ANALYSIS

Statement: This product was manufactured and tested according to MSD documents. This lot meets MSD’s specifications. This product is intended for Research Use Only. Not for use in Diagnostic Procedures.

Values are provided in two units - MSD Arbitrary Units/mL (AU/mL) and WHO Biological Arbitrary Units/mL (BAU/mL) (NIBSC 20/136)

Description	Cat #	Lot#	Expiration Date	Storage Temp.
Proficiency Sample 134	C50AEF-1	340338	30 Sep 2025	≤ -70°C
Proficiency Sample 205	C50AEG-1	340339	30 Sep 2025	≤ -70°C
Proficiency Sample 277	C50AFS-1	340373	30 Sep 2025	≤ -70°C
Proficiency Sample 314	C50AEJ-1	340341	30 Sep 2025	≤ -70°C
Proficiency Sample 370	C50AEL-1	340343	30 Sep 2025	≤ -70°C
Proficiency Sample 467	C50AEP-1	340346	30 Sep 2025	≤ -70°C
Proficiency Sample 478	C50AEQ-1	340347	30 Sep 2025	≤ -70°C
Proficiency Sample 503	C50AET-1	340350	30 Sep 2025	≤ -70°C
Proficiency Sample 562	C50AFV-1	340376	30 Sep 2025	≤ -70°C
Proficiency Sample 577	C50AEW-1	340353	30 Sep 2025	≤ -70°C
Proficiency Sample 605	C50AEZ-1	340356	30 Sep 2025	≤ -70°C
Proficiency Sample 678	C50AFB-1	340358	30 Sep 2025	≤ -70°C
Proficiency Sample 683	C50AFC-1	340359	30 Sep 2025	≤ -70°C
Proficiency Sample 812	C50AFH-1	340364	30 Sep 2025	≤ -70°C
Proficiency Sample 862	C50AFK-1	340366	30 Sep 2025	≤ -70°C
Proficiency Sample 920	C50AFN-1	340369	30 Sep 2025	≤ -70°C
Proficiency Sample 954	C50AFP-1	340370	30 Sep 2025	≤ -70°C
Proficiency Sample 987	C50AFQ-1	340371	30 Sep 2025	≤ -70°C



CERTIFICATE OF ANALYSIS

Assignments with IgG

Description	Concentration (AU/mL)															
	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD	SARS-CoV-2 S1 NTD	SARS-CoV-1 Spike	HCoV-NL63 Spike	HCoV-HKU1 Spike	HCoV-OC43 Spike	HCoV-229E Spike	Flu A/HongKong H3	MERS-CoV Spike	Flu B/Brisbane HA	Flu A/Shanghai H7	Flu A/Michigan H1	Flu B/Phuket HA	RSV Pre-Fusion F
Proficiency Sample 134	171,000	97,900	44,600	2,500	N/A	8,500	140,000	612,000	35,300	12,900	N/A	18,500	6,090	32,600	11,200	145,000
Proficiency Sample 205	123,000	378,000	19,800	1,580	25,300	5,200	28,700	151,000	63,000	92,500	53,600	145,000	6,230	89,600	194,000	56,500
Proficiency Sample 277	55.4	96.6	41.3	1.15	87.3	9,700	5,470	45,100	29,400	78,100	849	70,600	4,930	38,900	47,600	333,000
Proficiency Sample 314	103,000	259,000	23,600	1,060	51,100	10,700	88,000	390,000	46,100	63,900	100,000	296,000	7,010	91,000	194,000	476,000
Proficiency Sample 370	21,700	100,000	7,120	345	5,710	5,300	20,800	83,900	20,200	63,400	7,730	240,000	12,300	159,000	197,000	284,000
Proficiency Sample 467	48,400	205,000	16,100	868	8,510	1,150	36,200	88,700	8,860	33,300	21,800	43,600	N/A	25,600	140,000	79,000
Proficiency Sample 478	18,400	11,100	8,700	158	1,370	1,550	20,000	60,400	16,000	52,800	1,560	160,000	2,540	381,000	188,000	278,000
Proficiency Sample 503	16,200	67,200	4,880	306	1,770	4,020	8,250	63,900	12,600	23,500	1,820	79,100	5,710	56,800	39,100	96,100
Proficiency Sample 562	24.7	158	10.2	0.280	12.1	2,630	2,050	22,400	17,500	49,400	48.5	80,700	4,170	87,900	336,000	116,000
Proficiency Sample 577	39,700	32,700	15,300	558	4,320	6,120	21,900	143,000	27,000	236,000	10,600	98,300	6,780	106,000	45,600	78,100
Proficiency Sample 605	28,100	201,000	4,150	875	8,720	5,990	53,900	151,000	40,300	15,000	N/A	48,900	2,210	18,500	62,900	418,000
Proficiency Sample 678	27,100	17,700	9,330	479	2,210	5,010	7,510	35,300	21,000	9,330	N/A	10,200	3,540	12,000	9,500	91,000
Proficiency Sample 683	16,300	83,900	4,030	193	2,140	13,400	21,200	98,500	44,100	60,200	N/A	104,000	4,900	94,800	98,000	248,000
Proficiency Sample 812	25,000	59,600	7,610	332	4,470	3,990	9,950	45,000	26,400	45,100	N/A	22,800	4,940	31,300	19,300	236,000
Proficiency Sample 862	272,000	200,000	85,600	5,720	14,500	5,780	58,500	263,000	11,800	13,300	N/A	124,000	22,400	72,000	67,200	194,000
Proficiency Sample 920	9,780	51,500	3,140	163	765	1,600	8,700	38,900	22,000	65,900	N/A	72,500	1,540	66,700	81,700	40,000
Proficiency Sample 954	6,370	9,490	3,280	73.4	827	4,470	13,000	55,800	39,200	5,690	N/A	61,000	3,650	28,800	37,800	90,200
Proficiency Sample 987	265,000	244,000	91,300	5,680	33,300	6,220	29,600	149,000	16,100	132,000	9,050	103,000	7,090	36,200	154,000	371,000

N/A = Not Applicable



CERTIFICATE OF ANALYSIS

Assignments with IgA

Description	Concentration (AU/mL)															
	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD	SARS-CoV-2 S1 NTD	SARS-CoV-1 Spike	HCoV-NL63 Spike	HCoV-HKU1 Spike	HCoV-OC43 Spike	HCoV-229E Spike	Flu A/HongKong H3	MERS-CoV Spike	Flu B/Brisbane HA	Flu A/Shanghai H7	Flu A/Michigan H1	Flu B/Phuket HA	RSV Pre-Fusion F
Proficiency Sample 134	9,110	4,510	4,630	2,730	8,760	3,660	27,700	49,500	1,870	N/A	7,540	3,840	7,230	1,620	2,720	132,000
Proficiency Sample 205	3,890	15,000	1,820	669	N/A	536	3,130	11,000	2,060	2,460	2,890	7,320	366	1,070	28,500	17,000
Proficiency Sample 277	N/A	N/A	N/A	N/A	N/A	4,020	3,330	14,500	5,920	N/A	1,670	5,370	1,490	10,200	5,500	51,500
Proficiency Sample 314	12,900	27,300	3,830	1,590	5,140	2,780	4,080	15,400	4,830	3,540	N/A	253,000	485	628	14,300	77,300
Proficiency Sample 370	2,400	9,440	1,890	263	N/A	601	1,220	N/A	6,230	7,260	1,200	2,430	6,970	12,200	2,200	119,000
Proficiency Sample 467	3,730	2,340	2,070	740	264	835	5,400	5,980	1,190	12,800	1,460	5,610	708	504	7,290	30,300
Proficiency Sample 478	3,520	2,270	3,490	348	236	286	1,130	5,780	2,260	3,130	1,660	3,630	273	4,270	5,120	14,000
Proficiency Sample 503	1,220	1,910	900	246	189	1,840	2,690	5,920	624	3,680	N/A	5,600	2,640	1,370	2,670	25,400
Proficiency Sample 562	N/A	N/A	N/A	N/A	N/A	1,530	1,570	1,160	4,010	2,940	N/A	1,800	1,850	2,460	8,010	20,900
Proficiency Sample 577	11,600	392	7,210	532	507	1,040	2,890	4,970	1,830	10,100	N/A	8,890	4,940	2,160	8,450	19,000
Proficiency Sample 605	14,000	2,910	8,090	3,120	2,910	1,120	6,410	11,700	4,520	1,080	N/A	48,400	239	757	46,000	43,000
Proficiency Sample 678	1,300	669	556	257	171	1,450	567	2,770	819	154	1,960	2,420	120	762	2,730	7,590
Proficiency Sample 683	5,690	24,300	3,520	755	374	942	3,640	18,900	N/A	8,530	N/A	17,500	2,950	9,820	54,200	48,800
Proficiency Sample 812	2,370	2,940	1,580	440	131	394	2,000	2,070	2,850	2,550	2,250	3,090	2,700	371	2,590	61,000
Proficiency Sample 862	54,100	80,700	5,380	23,900	2,380	15,200	9,910	17,300	94,900	N/A	N/A	30,800	1,110	4,380	19,200	146,000
Proficiency Sample 920	1,420	1,500	796	323	114	10,700	202	899	2,120	2,750	1,490	36,700	391	10,900	85,900	6,320
Proficiency Sample 954	1,280	11,000	870	275	183	2,120	16,200	4,790	2,540	234	1,330	2,580	335	1,930	1,120	6,950
Proficiency Sample 987	12,200	7,970	7,840	4,020	806	864	604	3,820	356	1,120	N/A	1,740	796	187	5,160	15,900

N/A = Not Applicable



CERTIFICATE OF ANALYSIS

Assignments with IgM

Description	Concentration (AU/mL)															
	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD	SARS-CoV-2 S1 NTD	SARS-CoV-1 Spike	HCoV-NL63 Spike	HCoV-HKU1 Spike	HCoV-OC43 Spike	HCoV-229E Spike	Flu A/Hong Kong H3	MERS-CoV Spike	Flu B/Brisbane HA	Flu A/Shanghai H7	Flu A/Michigan H1	Flu B/Phuket HA	RSV Pre-Fusion F
Proficiency Sample 134	8,010	2,680	6,640	306	N/A	62.0	N/A	N/A	83.6	56.2	N/A	10,700	93.9	778	11,900	523
Proficiency Sample 205	36,300	4,620	40,400	1,010	537	18.1	117	N/A	43.6	32.1	N/A	19,200	39.5	48.8	18,400	393
Proficiency Sample 277	N/A	N/A	N/A	N/A	194	N/A	53.0	57.5	46.0	28.1	125	951	N/A	87.5	1,500	216
Proficiency Sample 314	42,800	37,000	19,300	N/A	1,100	35.3	326	113	77.2	37.2	213	3,970	56.5	61.3	4,610	461
Proficiency Sample 370	27,200	470	34,100	86.9	56.7	N/A	75.2	N/A	N/A	27.0	27.9	1,770	N/A	202	2,210	238
Proficiency Sample 467	2,240	321	2,050	15.4	N/A	N/A	198	N/A	N/A	40.6	93.6	1,370	N/A	120	1,480	182
Proficiency Sample 478	1,750	663	1,640	63.0	111	N/A	44.2	70.7	79.4	28.2	72.7	153	N/A	292	477	129
Proficiency Sample 503	1,380	4,710	694	202	81.1	19.5	170	108	162	38.6	143	9,880	44.5	487	12,700	274
Proficiency Sample 562	N/A	N/A	N/A	N/A	N/A	N/A	54.0	50.5	N/A	39.3	30.8	55.3	N/A	66.2	192	215
Proficiency Sample 577	6,100	380	4,450	25.0	183	N/A	350	N/A	128	95.0	392	9,930	128	68.5	10,900	288
Proficiency Sample 605	9,150	553	9,410	120	N/A	N/A	29.7	33.4	378	42.3	177	1,230	N/A	256	1,670	116
Proficiency Sample 678	1,610	686	1,290	60.0	145	35.6	N/A	61.8	93.9	97.7	349	3,300	61.0	N/A	4,900	189
Proficiency Sample 683	28,300	18,300	22,700	688	N/A	26.8	N/A	N/A	88.7	103	993	N/A	39.4	140	N/A	1,030
Proficiency Sample 812	8,470	5,350	7,910	232	59.1	26.9	168	N/A	70.5	56.1	124	1,190	343	97.4	1,850	391
Proficiency Sample 862	34,800	N/A	7,390	1,920	731	76.4	N/A	N/A	N/A	122	1,280	14,500	N/A	860	13,100	N/A
Proficiency Sample 920	2,350	690	1,640	36.5	75.3	21.9	99.5	N/A	55.3	N/A	105	2,210	138	366	2,210	893
Proficiency Sample 954	503	974	370	14.0	N/A	N/A	N/A	N/A	N/A	N/A	38.7	108	N/A	44.2	300	134
Proficiency Sample 987	40,900	2,780	30,000	1,780	640	16.9	74.8	56.8	45.4	43.6	70.2	1,850	N/A	91.5	2,240	195

N/A = Not Applicable



CERTIFICATE OF ANALYSIS

Description	WHO Assignments with IgG			WHO Assignments with IgA			WHO Assignments with IgM		
	Concentration (BAU/mL)			Concentration (BAU/mL)			Concentration (BAU/mL)		
	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD	SARS-CoV-2 Spike	SARS-CoV-2 Nucleocapsid	SARS-CoV-2 S1 RBD
Proficiency Sample 134	1,541	231	1,213	82.1	10.6	126	72.2	6.32	181
Proficiency Sample 205	1,108	892	539	35.0	35.4	49.5	327	10.9	1,100
Proficiency Sample 277	0.499	0.228	1.12	N/A	N/A	N/A	N/A	N/A	N/A
Proficiency Sample 314	928	611	642	116	64.4	104	386	87.3	525
Proficiency Sample 370	196	236	194	21.6	22.3	51.4	245	1.11	928
Proficiency Sample 467	436	484	438	33.6	5.52	56.3	20.2	0.758	55.8
Proficiency Sample 478	166	26.2	237	31.7	5.36	94.9	15.8	1.56	44.6
Proficiency Sample 503	146	159	133	11.0	4.51	24.5	12.4	11.1	18.9
Proficiency Sample 562	0.223	0.373	0.277	N/A	N/A	N/A	N/A	N/A	N/A
Proficiency Sample 577	358	77.2	416	105	0.925	196	55.0	0.897	121
Proficiency Sample 605	253	474	113	126	6.87	220	82.4	1.31	256
Proficiency Sample 678	244	41.8	254	11.7	1.58	15.1	14.5	1.62	35.1
Proficiency Sample 683	147	198	110	51.3	57.3	95.7	255	43.2	617
Proficiency Sample 812	225	141	207	21.4	6.94	43.0	76.3	12.6	215
Proficiency Sample 862	2,451	472	2,328	487	190	146	314	N/A	201
Proficiency Sample 920	88.1	122	85.4	12.8	3.54	21.7	21.2	1.63	44.6
Proficiency Sample 954	57.4	22.4	89.2	11.5	26.0	23.7	4.53	2.30	10.1
Proficiency Sample 987	2,388	576	2,483	110	18.8	213	369	6.56	816

N/A = Not Applicable

Name	Function	Signature	Date
Karen Hamilla	Quality		07 APR 2021