

# Difference between calibration and practical force proving instruments

Seif M. Osman\*<sup>1,2</sup>, Gouda M. Mahmoud<sup>1</sup>, Abdulelah A. Binown<sup>2</sup>, Hamad Alghamdi<sup>2</sup>

#	Load cell capacity (kN)	Classification				Diff. in uncertainty without repeatability contribution (ppm)	
		Range	Criteria	Range	Criteria	20 % to 50 %	50 % to 100 %
		20 % to 50 %	( $b, b', f_c, v, f_0$ )	50 % to 100 %	$b, b', f_c, v, f_0$	20 % to 50 %	50 % to 100 %
1	1	0	—	0	—	17	5
2	1	0	—	0	—	7	8
3	1	0.5	$v$	0	—	2	1
4	1	0	—	0	—	13	44
5	2	out of class	$f_c$	2	$f_c$	215	215
6	2.5	0	—	0	—	44	44
7	5	0.5	—	0.5	—	75	183
8	5	0	—	0	—	31	29
9	5	0.5	$f_c$	0	—	1	21
10	5	0	—	0	—	7	8
11	10	0	—	0	—	1	1
12	10	0	—	0	—	17	14
13	10	0	—	0	—	4	2
14	10	0	—	0	—	5	5
15	10	0	—	0	—	4	2
16	10	0	—	0	—	8	2
17	20	out of class	$f_c$	out of class	$f_c$	5	2
18	20	out of class	$f_c$	1	$f_c$	30	42
19	25	out of class	$f_c$	2	$f_c$	123	35
20	25	0.5	$v$	0	$v$	0	0
21	25	1	$v$	0.5	$v$	0	0
22	25	0.5	$v$	0	$v$	0	1
23	45	0.5	$b', f_c, v$	0.5	$b$	192	62
24	45	0	—	0	—	6	2
25	45	2	$f_c$	2	$f_c$	1	146
26	50	0	—	0	—	6	6
27	50	0.5	$f_0$	0.5	$f_0$	2	2
28	50	0	—	0	—	12	9
29	50	0.5	$v$	0.5	$v$	2	29
30	50	0	—	0	—	1	1
31	50	0	—	0	—	12	8

32	50	0.5	$v$	0.5	$v$	5	10
33	50	0	—	0	—	1	2
34	50	0.5	$v$	0.5	$v$	1	7
35	50	0.5	$b$	0.5	$b$	39	27
36	100	0	—	0	—	38	38
37	100	2	$f_0$	2	$f_0$	135	68
38	100	0	—	0	—	0	5
39	100	0.5	$v$	0	—	1	8
40	100	1	$v$	0.5	$v$	1	1
41	200	0	—	0	—	14	40
42	200	0	—	0	—	85	85
43	200	0	—	0	—	18	17
44	200	0	—	0	—	1	6
45	200	1	$b$	0.5	$b$	60	3
46	250	0.5	$b, v$	0	$v$	2	1
47	250	0.5	$v$	0.5	$v$	1	1
48	250	0.5	$v$	0	—	1	1
49	445	out of class	$f_c$	out of class	$f_c$	1	1
50	500	0.5	$v$	0.5	$v$	4	2
51	500	0.5	$v$	0.5	$v$	2	2
52	500	out of class	$b, f_c$	out of class	$b, f_c$	476	53
53	500	0	—	0	—	1	107
54	500	0	—	0	—	2	16
55	500	0	—	0	—	46	65
56	1000	0	—	0	—	6	3
57	1000	0	—	0	—	5	1
58	1000	0	—	0	—	139	19
59	1000	0	—	0	—	2	13
60	1000	0	—	0	—	7	3
61	1200	2	$v$	1	$v$	16	8
62	1200	2	$v$	1	$v$	2	2
63	2000	out of class	$f_0$	out of class	$f_0$	50	125
64	3000	0.5	$v, b$	0.5	$b$	31	19
65	3000	0	—	0	—	50	31
66	3000	1	$v, b$	0.5	$b, f_c, f_0$	34	75
67	3000	out of class	$f_0$	out of class	$f_0$	1451	437
68	5000	0	—	0	—	4	10
69	5000	1	$v$	0.5	$b', f_0$	270	128
70	5000	0	—	0	—	9	12