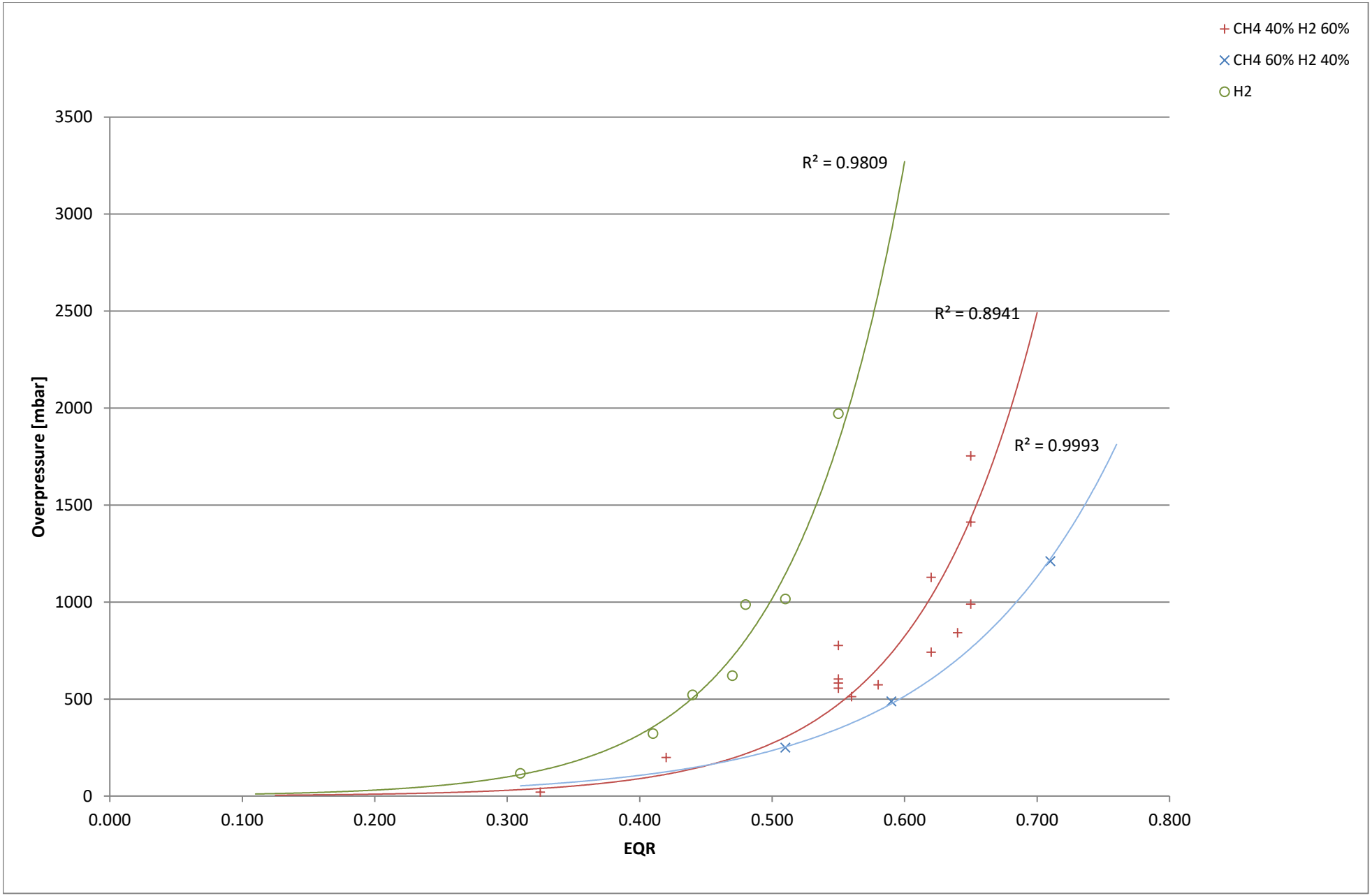
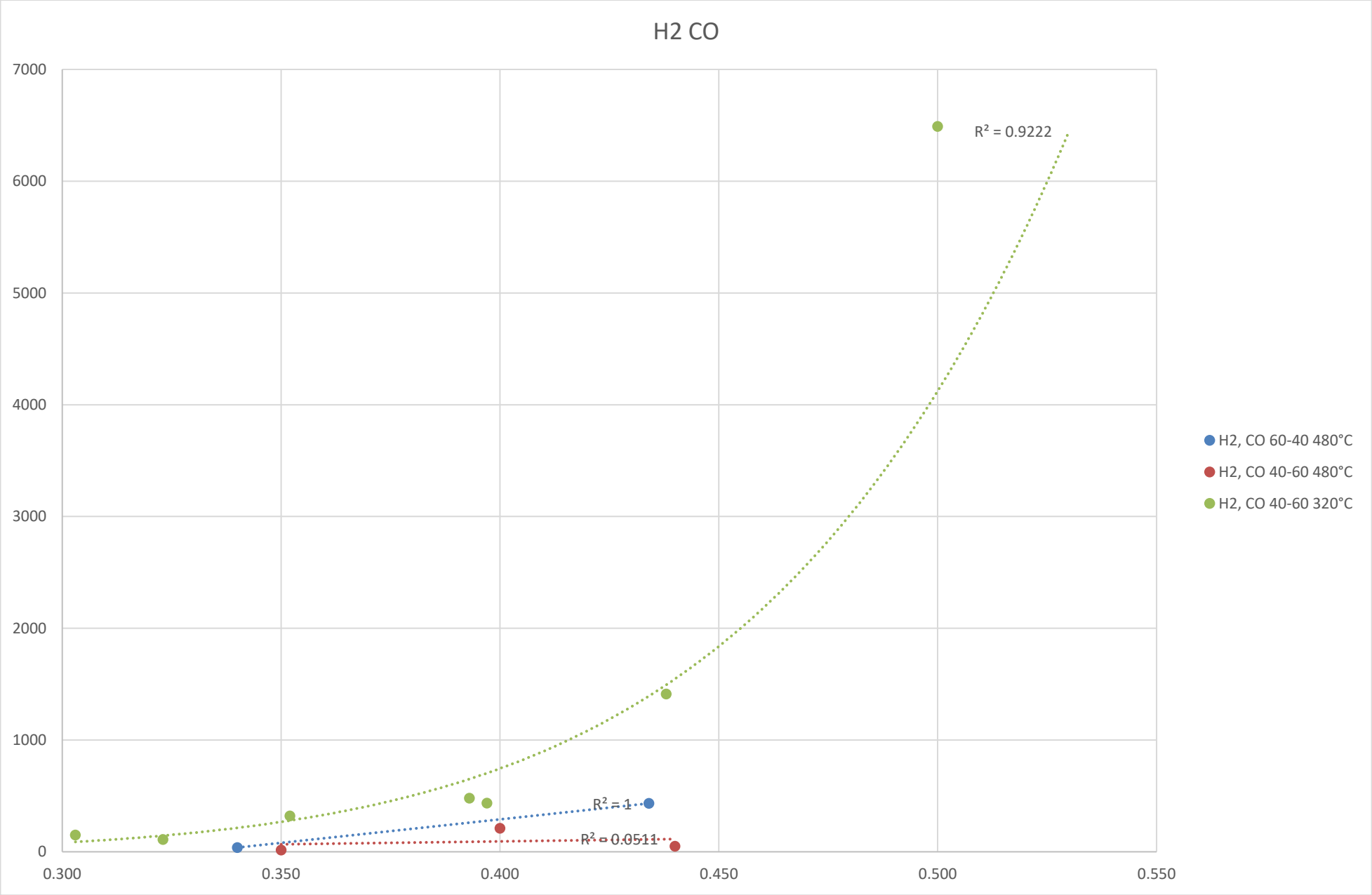
Date/Time	Mixture	Mixture vol % ratio	Test Number	Eq. Ratio	CH4 vol%	CO vol%	H2 vol%	Fuel Gas Flow Rate [kg/s]	Oxygen Flow Rate [kg/s]	Peak Pressure mbar	Initial Pressure after HE mbar	End Plate	Nominal Temperature [°C]	HS video	Comments
18/02/16 17:20:51	CH4/H2	40/60	1	0.550	40	-	60	0.249	0.501	556		off	550		Peak pressure at KU7 in circular duct. Good test but failed to get good IP signals
27/02/16 14:21:34	CH4/H2	40/60	2	0.550	40	-	60	0.249	0.501	603		off	550		Peak pressure at KU7 in circular duct. Good test but failed to get good OP signals
27/02/16 15:33:52	CH4/H2	40/60	3	0.550	40	-	60	0.252	0.498	583	350	off	550		Peak pressure at KU7 in circular duct. Consistent overpressures with earlier failed tests
27/02/16 15:43:55	CH4/H2	40/60	4	0.620	40	-	60	0.286	0.512	742	630	off	550		Peak pressure at KU7 in circular duct
01/03/16 12:25:00	CH4/H2	40/60	5	0.650	40	-	60	0.296	0.517	1412	1410	off	550		Peak pressure at KU2 in section HR4 - after HE
03/03/16 15:59:20	CH4/H2	40/60	6	0.550	40	-	60	0.248	0.515	776	390	on	550		Peak pressure at KU7 in circular duct
03/03/16 16:14:09	CH4/H2	40/60	7	0.620	40	-	60	0.281	0.496	1128	590	on	550		Peak pressure at KU7 in circular duct
05/03/16 13:48:53	CH4/H2	40/60	8	0.650	40	-	60	0.300	0.520	1753	1300	on	550		Peak pressure at PCB on end plate
05/03/16 15:13:54	H2	100	9	0.470	-	-	100	0.107	0.480	621	390	on	550		Peak pressure at KU6 in the circular duct
08/03/16 13:08:39	H2	100	10	0.510	-	-	100	0.121	0.505	1016	920	on	550		Peak pressure at PCB on end plate
08/03/16 14:43:31	H2	100	11	0.550	-	-	100	0.117	0.501	-	-	on	550		Data not analysed
14/03/16 12:09:38	H2	100	12	0.550	-	-	100	0.132	0.520	1971	1790	on	550		Peak pressure at PCB on end plate. Repeat of test 11.
05/04/16 16:03:15	CO/H2	60/40	13	0.510	-	60	40	1.058	0.547	779	420	on	550		Peak pressure at KU6 in the circular duct
16/05/16 14:11:17	CO/H2	60/40	14	0.550	-	60	40	1.158	0.501	-	-	on	550		Data not analysed - flow control valve 'latched open' - ignition not attempted
23/05/16 16:58:46	CO/H2	60/40	15	0.560	-	60	40	1.185	0.519	822	520	on	550		Peak pressure at KU6 in the circular duct - noisy data set
26/08/16 15:18:49	CO/H2	60/40	16	0.590	-	60	40	1.272	0.506	811	590	on	550		Peak pressure at KU6 in the circular duct
26/08/16 18:26:38	CO/H2	60/40	17	0.620	-	60	40	1.345	0.503	1374	1210	on	550		Peak pressure at KU5 ahead of the HE
26/06/18 14:46:45	H2	100	18	0.410	-	-	100	0.092	0.577	322	152	on	550	yes	Peak pressure at KU10 near the End Plate
28/06/18 12:04:41	H2	100	19	0.440	-	-	100	0.100	0.498	522	276	on	550	yes	Peak pressure at KU10 near the End Plate
28/06/18 15:28:25	H2	100	20	0.480	-	-	100	0.111	0.484	987	525	on	550	yes	Peak pressure at KU10 near the End Plate
09/11/18 12:18:58	CH4/H2	40/60	21	0.420	40	-	60	0.181	0.509	199	71	on	550	yes	Peak pressure at KU2 ahead of the HE
13/11/18 11:49:24	CH4/H2	40/60	22	0.325	40	-	60	0.140	0.477	20	-	on	550	yes	Very weak (approximate) overpressure seen in duct
15/11/18 12:09:13	CH4/H2	40/60	23	0.560	40	-	60	0.250	0.458	512	282	on	550	yes	Peak pressure at KU10 near the End Plate
21/11/18 14:38:41	CH4/H2	40/60	24	0.580	40	-	60	0.259	0.485	573	385	on	550	yes	Peak pressure at KU8 in HR5. Pressure of 504 mbar at KU1 at the exit of the duct.
12/12/18 14:30:18	CH4/H2	40/60	25	0.640	40	-	60	0.290	0.491	842	392	on	550	yes	Peak pressure at KU10 near the End Plate
17/12/18 14:35:40	CH4/H2	40/60	26	0.650	40	-	60	0.293	0.498	990	659	on	550	yes	Peak pressure at KU10 near the End Plate
08/01/19 11:24:57	CH4/H2	60/40	27	0.590	60	-	40	0.288	0.511	488	262	on	550	yes	Peak pressure at KU1 in duct
08/01/19 14:46:56	CH4/H2	60/40	28	0.710	60	-	40	0.352	0.522	1211	534	on	550	yes	Peak pressure at KU10 near the End Plate
08/01/19 15:24:16	CH4/H2	60/40	29	0.510	60	-	40	0.244	0.511	250	117	on	550	yes	Peak pressure at KU1 in duct
09/01/19 11:41:19	CH4	100	30	0.640	100	-	-	0.344	0.539	385	150	on	550	yes	Peak pressure at KU1 in duct
09/01/19 13:53:11	CH4	100	31	0.790	100	-	-	0.435	0.538	967	683	on	550	yes	Peak pressure at KU10 near the End Plate
09/01/19 14:31:23	CH4	100	32	0.490	100	-	-	0.263	0.539	117	42	on	550	low overpressure - video not triggered	Peak pressure at KU1 in duct
15/01/19 11:34:20	H2	100	33	0.310	-	-	100	0.066	0.525	-	-	on	550	no	Auto-ignition event. Maximum EQR and hydrogen mass flow stated at time of ignition.
15/01/19 13:40:08	H2	100	34	0.410	-	-	100	0.090	0.531	-	-	on	550	no	RA1 and RA2 removed. Auto-ignition event. Maximum EQR and hydrogen mass flow stated at time of ignition.
16/01/19 13:42:10	H2	100	35	0.520	-	-	100	0.120	0.464	2196	710	on	480	yes	Lower RPM tests (11,500). Peak pressure ate KU9 in HR6 near end plate.
16/01/19 15:00:15	H2	100	36	0.480	-	-	100	0.108	0.448	1158	475	on	480	yes	Lower RPM tests (11,500). Peak pressure at KU10 near the End Plate
16/01/19 15:57:31	H2	100	37	0.540	-	-	100	0.126	0.443	3115	1626	on	480	yes	Lower RPM tests (11,500). Peak pressure at KU10 near the End Plate
22/01/19 12:15:58	H2	100	38	0.420	-	-	100	0.094	0.456	601	276	on	480	yes	Lower RPM tests (11,500). Peak pressure at KU10 near the End Plate
22/01/20 14:09:19	H2	100	39	0.350	-	-	100	0.076	0.462	251	145	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 251 mbar seen at KU8 in HR5
22/01/21 15:27:59	H2	100	40	0.540	-	-	100	0.125	0.463	3430	1639	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 3430 mbar seen at KU7 in HR4
25/01/19 11:44:25	CO/H2	40/60	41	0.395	-	40	60	0.533	0.446	-	-	on	480	no	Lower RPM tests (11,500). AUTOIGNITION. Leak on pump ocurred on 23rd January. Unable to mix gases satisfactorily. Tests 41 to 43 should be seen as indicative.
25/01/19 13:59:45	CO/H2	40/60	42	0.400	-	40	60	0.548	0.451	336	210	on	480	video triggered late - no useful imgages	Lower RPM tests (11,500). Highest overpressure of 336 mbar seen at KU8 in HR5
25/01/19 14:34:08	CO/H2	40/60	43	0.425	-	40	60	0.580	0.468	-	-	on	480	no	Lower RPM tests (11,500). AUTOIGNITION. Maximum EQR and gas mass flow rates stated for time of ignition.
12/02/19 14:50:59	CO/H2	60/40	44	0.455	-	60	40	0.893	0.433	-	-	on	480	yes	Lower RPM tests (11,500). AUTOIGNITION. Maximum EQR and gas mass flow rates stated for time of ignition.
12/02/19 15:39:19	CO/H2	60/40	45	0.440	-	60	40	0.858	0.449	-	-	on	480	no	Lower RPM tests (11,500). AUTOIGNITION. Maximum EQR and gas mass flow rates stated for time of ignition.
12/02/20 15:44:41	CO/H2	60/40	46	0.342	-	60	40	0.647	0.461	-	-	on	480	yes	Lower RPM tests (11,500). AUTOIGNITION. Maximum EQR and gas mass flow rates stated for time of ignition.
14/02/19 11:31:10	CO/H2	60/40	47	0.434	-	60	40	0.847	0.450	699	433	on	480	communication to camera lost during test	Lower RPM tests (11,500). Highest overpressure of 699 mbar seen at KU10 in HR6
14/02/19 15:17:52	CO/H2	60/40	48	0.340	-	60	40	0.645	0.473	123	38	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 123 mbar seen at KU1 in CD4
15/02/19 12:41:25	CO/H2	40/60	49	0.440	-	40	60	0.615	0.451	150	49	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 150 mbar seen at KU1 in CD4
19/02/19 11:56:15	CO/H2	40/60	50	0.350	-	40	60	0.470	0.454	72	15	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 72 mbar seen at KU1 in CD4
19/02/19 12:09:39	CO/H2	40/60	51	0.395	-	40	60	0.538	0.454	-	-	on	480	yes	Lower RPM tests (11,500). AUTOIGNITION. Maximum EQR and gas mass flow rates stated for time of ignition.
28/02/19 11:44:16	CH4	100	52	0.650	100	-	-	0.344	0.312	394	142	on	320	yes	Low temperature tests. Highest overpressure of 394 mbar seen at KU1 in CD4
28/02/19 13:52:20	CH4	100	53	0.810	100	-	-	0.430	0.311	831	303	on	320	yes	Low temperature tests. Highest overpressure of 831 mbar seen at KU1 in CD4
28/02/19 14:15:44	CH4	100	54	0.506	100	-	-	0.261	0.311	102	38	on	320	yes	Low temperature tests. Highest overpressure of 102 mbar seen at KU9 after HE
05/03/19 11:59:49	CH4/H2	60/40	55	0.600	60	-	40	0.288	0.311	514	210	on	320	yes	Low temperature tests. Highest overpressure of 514 mbar seen at KU1 in CD4
05/03/19 14:07:36	CH4/H2	60/40	56	0.500	60	-	40	0.238	0.313	123	53	on	320	yes	Low temperature tests. Highest overpressure of 123 mbar seen at KU7 in HR5
05/03/19 14:24:38	CH4/H2	60/40	57	0.705	60	-	40	0.344	0.313	3105	760	on	320	yes	Low temperature tests. Highest overpressure of 3105 mbar seen at KU7 in HR4
06/03/19 11:59:49	CH4/H2	40/60	58	0.510	40	-	60	0.218	0.310	182	104	on	320	yes	Low temperature tests. Highest overpressure of 182 mbar seen at KU1 in CD4
06/03/19 13:32:22	CH4/H2	40/60	59	0.410	40	-	60	0.171	0.305	64	23	on	320	yes	Low temperature tests. Highest overpressure of 64 mbar seen at KU4 in HE1
06/03/19 13:50:08	CH4/H2	40/60	60	0.590	40	-	60	0.253	0.310	640	376	on	320	yes	Low temperature tests. Highest overpressure of 640 mbar seen at KU10 in HR6
12/03/19 13:40:33	H2	100	61	0.450	-	-	100	0.102	0.312	2833	1487	on	320	yes	Low temperature tests. Highest overpressure of 2833 mbar seen at KU7 in HR4
12/03/19 14:52:49	H2	100	62	0.350	-	-	100	0.077	0.314	502	266	on	320	yes	Low temperature tests. Highest overpressure of 502 mbar seen at KU0 in CD3
12/03/19 15:17:24	H2	100	63	0.285	-	-	100	0.062	0.318	278	115	on	320	yes	Low temperature tests. Highest overpressure of 278 mbar seen at KU0 in CD3
14/03/19 11:41:47	CO/H2	40/60	64	0.500	-	40	60	0.703	0.311	18172	6490	on	320	yes	Low temperature tests. DETONATION. Peak pressure seen at KU10 near end plate.
17/05/19 15:14:14	CO/H2	40/60	65	0.303	-	40	60	0.398	0.312	402	150	on	320	yes	Low temperature tests. Highest overpressure of 402 mbar seen at KU1 in CD4
17/05/19 15:20:45	CO/H2	40/60	66	0.352	-	40	60	0.470	0.308	497	320	on	320	yes	Low temperature tests. Highest overpressure of 497 mbar seen at KU10 in HR6
22/05/19 11:56:27	CO/H2	40/60	67	0.393	-	40	60	0.533	0.310	898	480	on	320	yes	Low temperature tests. Highest overpressure of 898 mbar seen at KU1 in CD4
24/05/19 11:23:45	CO/H2	60/40	68	0.397	-	60	40	0.764	0.307	1386	435	on	320	yes	Low temperature tests. Highest overpressure of 1386 mbar seen at KU1 in CD4
24/05/19 11:23:46	CO/H2	60/40	69	0.438	-	60	40	0.856	0.308	2712	1412	on	320	yes	Low temperature tests. Highest overpressure of 2712 mbar seen at KU7 in HR4
24/05/19 11:23:47	CO/H2	60/40	70	0.323	-	60	40	0.606	0.316	317	110	on	320	yes	Low temperature tests. Highest overpressure of 317 mbar seen at KU1 in CD4
30/05/19 11:55:14	CH4/CO/H2	25/35/40	71	0.465	25	35	40	0.471	0.312	584	240	on	320	yes	Low temperature tests. Highest overpressure of 584 mbar seen at KU1 in CD4
30/05/19 13:43:13	CH4/CO/H2	25/35/40	72	0.496	25	35	40	0.506	0.307	1322	440	on	320	yes	Low temperature tests. Highest overpressure of 1322 mbar seen at KU1 in CD4
30/05/19 14:05:33	CH4/CO/H2	25/35/40	73	0.428	25	35	40	0.431	0.310	326	156	on	320	yes	Low temperature tests. Highest overpressure of 326 mbar seen at KU1 in CD4
07/06/19 11:22:01	CH4/CO/H2	25/35/40	74	0.463	25	35	40	0.471	0.449	464	161	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 464 mbar seen at KU1 in CD4
07/06/19 13:20:41	CH4/CO/H2	25/35/40	75	0.493	25	35	40	0.505	0.443	553	199	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 553 mbar seen at KU1 in CD4
07/06/19 13:26:12	CH4/CO/H2	25/35/40	76	0.441	25	35	40	0.447	0.450	361	119	on	480	yes	Lower RPM tests (11,500). Highest overpressure of 361 mbar seen at KU1 in CD4


CH4 40% H2 60%
CH4 60% H2 40%
H2
R² = 0.9809
R² = 0.8941
R² = 0.9993
Overpressure [mbar]
EQR
0
500
1000
1500
2000
2500
3000
3500
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800


H2 CO
7000
6000
5000
4000
3000
2000
1000
0
0.300
0.350
0.400
0.450
0.500
0.550
R² = 0.9222
R² = 1
R² = 0.0511
H2, CO 60-40 480°C
H2, CO 40-60 480°C
H2, CO 40-60 320°C

Date/Time	Mixture	Mixture vol % ratio	Eq. Ratio	Peak Pressure mbar	Initial Pressure after HE mbar	Nominal Temperature [°C]
18/02/16 17:20:51	CH4/H2	40/60	0.550	556	#N/A	550
27/02/16 14:21:34	CH4/H2	40/60	0.550	603	#N/A	550
27/02/16 15:33:52	CH4/H2	40/60	0.550	583	350	550
27/02/16 15:43:55	CH4/H2	40/60	0.620	742	630	550
01/03/16 12:25:00	CH4/H2	40/60	0.650	1412	1410	550
03/03/16 15:59:20	CH4/H2	40/60	0.550	776	390	550
03/03/16 16:14:09	CH4/H2	40/60	0.620	1128	590	550
05/03/16 13:48:53	CH4/H2	40/60	0.650	1753	1300	550
05/03/16 15:13:54	H2	100	0.470	621	390	550
08/03/16 13:08:39	H2	100	0.510	1016	920	550
08/03/16 14:43:31	H2	100	0.550	#N/A	#N/A	550
14/03/16 12:09:38	H2	100	0.550	1971	1790	550
05/04/16 16:03:15	CO/H2	60/40	0.510	779	420	550
16/05/16 14:11:17	CO/H2	60/40	0.550	#N/A	#N/A	550
23/05/16 16:58:46	CO/H2	60/40	0.560	822	520	550
26/08/16 15:18:49	CO/H2	60/40	0.590	811	590	550
26/08/16 18:26:38	CO/H2	60/40	0.620	1374	1210	550
26/06/18 14:46:45	H2	100	0.410	322	152	550
28/06/18 12:04:41	H2	100	0.440	522	276	550
28/06/18 15:28:25	H2	100	0.480	987	525	550
09/11/18 12:18:58	CH4/H2	40/60	0.420	199	71	550
13/11/18 11:49:24	CH4/H2	40/60	0.325	20	#N/A	550
15/11/18 12:09:13	CH4/H2	40/60	0.560	512	282	550
21/11/18 14:38:41	CH4/H2	40/60	0.580	573	385	550
12/12/18 14:30:18	CH4/H2	40/60	0.640	842	392	550
17/12/18 14:35:40	CH4/H2	40/60	0.650	990	659	550
08/01/19 11:24:57	CH4/H2	60/40	0.590	488	262	550
08/01/19 14:46:56	CH4/H2	60/40	0.710	1211	534	550
08/01/19 15:24:16	CH4/H2	60/40	0.510	250	117	550
09/01/19 11:41:19	CH4	100	0.640	385	150	550
09/01/19 13:53:11	CH4	100	0.790	967	683	550
09/01/19 14:31:23	CH4	100	0.490	117	42	550
15/01/19 11:34:20	H2	100	0.310	#N/A	#N/A	550
15/01/19 13:40:08	H2	100	0.410	#N/A	#N/A	550
16/01/19 13:42:10	H2	100	0.520	2196	710	480
16/01/19 15:00:15	H2	100	0.480	1158	475	480
16/01/19 15:57:31	H2	100	0.540	3115	1626	480
22/01/19 12:15:58	H2	100	0.420	601	276	480
22/01/20 14:09:19	H2	100	0.350	251	145	480
22/01/21 15:27:59	H2	100	0.540	3430	1639	480
25/01/19 11:44:25	CO/H2	40/60	0.395	#N/A	#N/A	480
25/01/19 13:59:45	CO/H2	40/60	0.400	336	210	480
25/01/19 14:34:08	CO/H2	40/60	0.425	#N/A	#N/A	480
12/02/19 14:50:59	CO/H2	60/40	0.455	#N/A	#N/A	480
12/02/19 15:39:19	CO/H2	60/40	0.440	#N/A	#N/A	480
12/02/20 15:44:41	CO/H2	60/40	0.342	#N/A	#N/A	480
14/02/19 11:31:10	CO/H2	60/40	0.434	699	433	480
14/02/19 15:17:52	CO/H2	60/40	0.340	123	38	480
15/02/19 12:41:25	CO/H2	40/60	0.440	150	49	480
19/02/19 11:56:15	CO/H2	40/60	0.350	72	15	480
19/02/19 12:09:39	CO/H2	40/60	0.395	#N/A	#N/A	480
28/02/19 11:44:16	CH4	100	0.650	394	142	320
28/02/19 13:52:20	CH4	100	0.810	831	303	320
28/02/19 14:15:44	CH4	100	0.506	102	38	320
05/03/19 11:59:49	CH4/H2	60/40	0.600	514	210	320
05/03/19 14:07:36	CH4/H2	60/40	0.500	123	53	320
05/03/19 14:24:38	CH4/H2	60/40	0.705	3105	760	320
06/03/19 11:59:49	CH4/H2	40/60	0.510	182	104	320
06/03/19 13:32:22	CH4/H2	40/60	0.410	64	23	320
06/03/19 13:50:08	CH4/H2	40/60	0.590	640	376	320
12/03/19 13:40:33	H2	100	0.450	2833	1487	320
12/03/19 14:52:49	H2	100	0.350	502	266	320
12/03/19 15:17:24	H2	100	0.285	278	115	320
14/03/19 11:41:47	CO/H2	40/60	0.500	18172	6490	320
17/05/19 15:14:14	CO/H2	40/60	0.303	402	150	320
17/05/19 15:20:45	CO/H2	40/60	0.352	497	320	320
22/05/19 11:56:27	CO/H2	40/60	0.393	898	480	320
24/05/19 11:23:45	CO/H2	60/40	0.397	1386	435	320
24/05/19 11:23:46	CO/H2	60/40	0.438	2712	1412	320
24/05/19 11:23:47	CO/H2	60/40	0.323	317	110	320
30/05/19 11:55:14	CH4/CO/H2	25/35/40	0.465	584	240	320
30/05/19 13:43:13	CH4/CO/H2	25/35/40	0.496	1322	440	320
30/05/19 14:05:33	CH4/CO/H2	25/35/40	0.428	326	156	320
07/06/19 13:26:12	CH4/CO/H2	25/35/40	0.463	464	161	480
07/06/19 13:20:41	CH4/CO/H2	25/35/40	0.493	553	199	480
#REF!	CH4/CO/H2	25/35/40	0.441	361	119	480

CH4/H2	H2	CO/H2	CH4	CH4/CO/H2
2	10	14	31	72
3	11	15	32	73
4	12	16	33	74
5	13	17	53	75
6	19	18	54	76
7	20	42	55	77
8	21	43		
9	34	44		
22	35	45		
23	36	46		
24	37	47		
25	38	48		
26	39	49		
27	40	50		
28	41	51		
29	62	52		
30	63	65		
56	64	66		
57		67		
58		68		
59		69		
60		70		
61		71		
23	**18**	**23**	**6**	**6**
TRUE	TRUE	TRUE	TRUE	TRUE