



**ACS.CCLP1 EPC
SAFETY ASSESSMENT CRITERIA
INITIAL.DOMESTIC.LPG
EXTERNAL PIPEWORK CONNECTIONS**

CCLP1 EPC**INITIAL****Introduction**

Tests competence in:

- installation and commissioning of service pipework; single and multiple supplies
- re-connection and commissioning of existing installation pipework
- installation and commissioning of pre-fabricated LPG meter installations
- re-lighting of gas appliances.

Comprises:

1. Gas safety legislation and Standards.
2. Gas emergency actions and procedures.
3. Products and characteristics of combustion.
- 3(a). Characteristics of LPG.
- 3(b). LPG supply pressures inc. operation/positioning of emergency isolation, flow controls/valves.
- 3(c). LPG vessel and cylinder location, safety and sizing (inc. storage vessels and connections).
4. Ventilation.
5. Installation of pipework and fittings (service pipework) (and alteration of existing installation pipework).
6. Tightness testing and purging (of service and installation pipework).
8. Unsafe situations, use of emergency notices and warning labels.
12. Chimney Standards.
15. Re-establish existing gas supply and relight appliances/plant.

CBs and ACs may adopt Competence and Criteria numbering different to that used in this document.

CB and AC documentation may adopt wording for criteria different to that used in this document, provided the meaning is unaffected.

Range

All IP and LP LPG installations for PDs, RPHs, LAVs and small non-domestic premises.

Scope

All work within the scope of the relevant normative documents listed in TB 999 and where the total volume of the installation $\leq 0.02 \text{ m}^3$ and capacity of the meter $\leq 6 \text{ m}^3/\text{h}$ (where fitted).

Holders of this assessment will not be able to use it as a Core Gas Safety assessment to access appliance or equipment assessments without additionally taking the appropriate Core Gas Safety assessment(s).

Pre-requisites

None.

References and Normative Documents

MIs.

All relevant documents as listed in the Legislative, Normative & Informative Document List (LINDL), inc.:

- HSL56

- GIUSP.

ACS.SMB.003.ACRND identifies Normative Documents that should be held by ACs.

Abbreviations

AC. Assessment Centre
 CB. Certification Body
 CSST. Corrugated stainless steel tube
 DSEAR. Dangerous Substances and Explosive Atmospheres Regulations
 ECV. Emergency control valve
 HP. High pressure
 I. Initial
 IP. Intermediate pressure
 LP. Low pressure
 MIs. Manufacturer's/manufacturers' instructions
 OP. Operating pressure
 OPSO. Over pressure safety cut-off
 Ref. Reference
 UPSO. Under pressure safety cut-off.

1. Gas safety legislation and Standards

KNOWLEDGE AND UNDERSTANDING		REF	I
1. HS(L)56:			
(i)	Reg.2 General interpretation and application 2(1) to (5)		√
(ii)	Reg.3 Qualification and supervision 3(1),(2),(3),& (6)		√
(iii)	Reg.4 Duty on employer		√
(iv)	Reg.5 Materials and workmanship 5(1) to (3)		√
(v)	Reg.6 General safety precautions 6(1) to (9)		√
(vi)	Reg.7 Protection against damage 7(1) to (3)		√
(vii)	Reg.8 Existing gas fittings 8(1) to (3)		√

2. Gas emergency actions and procedures

KNOWLEDGE AND UNDERSTANDING		REF	I
Priorities of actions and responsibilities			
1.	dealing with gas leakage with fire; safety/fire precautions for vessels		√
2. dealing with gas leakage without fire:			
(i)	specific gravity and its effect in relation to air e.g. search techniques		√
(ii)	preventing/reducing dangerous gas concentrations gas in atmosphere and at low level		√
(iii)	stopping a gas escape downstream of an ECV		√
(iv)	action if gas continues to escape after turning off supply		√
3.	advice to occupants		√
4.	hazardous ignition sources and their elimination		√
5.	HSL56: Reg.37 Escape of gas 37(1) to (4)		√

3. Products and characteristics of combustion

PERFORMANCE CRITERIA		REF	I
1. visually inspect flame pictures of burners to identify those indicating:			
(i)	complete combustion		√
(ii)	incomplete combustion		√
2. identify incomplete combustion:			
(i)	around appliance location		√
(ii)	in appliance		√
3. CO detectors and indicators:			
(i)	identification of detectors and indicators		√
(ii)	installation – locations		√
(iii)	commissioning and maintenance of detectors (audible, readable, visual)		√
KNOWLEDGE AND UNDERSTANDING		REF	I

1.	main constituents of complete and incomplete combustion		√
2.	air requirements for complete combustion		√
3.	causes of appliance incomplete combustion at:		
(i)	burner		√
(ii)	combustion space		√
(iii)	heat exchanger		√
(iv)	flue		√
4.	symptoms of CO poisoning		√
5.	advice to give to a person who describes symptoms of being affected by products of combustion or when indicator/detector has activated		√
6.	other sources of CO and CO ₂ in dwellings		√
7.	ambient levels of CO in atmosphere		√
8.	levels of CO within dwellings and effect on electronic detectors		√
9.	causes of activation of CO detectors and indicators		√
10.	ambient levels of CO ₂ in atmosphere		√
11.	critical levels of CO ₂ that could cause vitiation affecting combustion process		√
12.	movement of products of combustion within properties and its effects		√
13.	advice to be given when a CO detector has activated	BS7967 2015 7.2	√
14.			
15.	manufacturing standards for electronic CO detectors (alarms)		√
16.	identifying unsafe situation of combustion products that could enter a premises.		√

3(a). Characteristics of LPG

KNOWLEDGE AND UNDERSTANDING		REF	I
1.	types of commercial LPG (propane, butane)		√
2.	storage pressures for propane and its relation to temperature		√
3.	relative density of vapour and its effect in relation to air		√
4.	vaporisation of liquid and off-takes - effects of temperature		√
5.	limits (range) of flammability		√
6.	calorific value		√

3(b). Supply pressures inc. operation and positioning of emergency isolation, flow controls and valves

PERFORMANCE CRITERIA		REF	I
1.	LPG regulators:		
(i)	turn off all appliances		√
(ii)	turn off gas supply		√
(iii)	zero pressure gauge and connect to appliance test point/outlet of final stage regulator		√
(iv)	observe OP of regulator at meter outlet as between 32 mbar and 42 mbar for flow between 6 m ³ /h and 0.5 m ³ /h and record all pressures, inc. lock-up pressure		√
(v)	turn on all remaining appliances and light all burners to provide max. anticipated load		√
(vi)	read OP and record. Dependant on regulator used, allow no more than 2.5 mbar loss		√
(vii)	remove gauge; re-seal test point and test for gas tightness		√
2.	check burner pressure at all other appliances to MIs		√
3.	check UPSO is working to MIs		√
4.	check OPSO is working to MIs		√
KNOWLEDGE AND UNDERSTANDING		REF	I
1.	recognition of supply pressures from gas storage vessels:		
(i)	HP stage		√
(ii)	IP stage		√
(iii)	LP stage		√
2.	operation and positioning of gas storage vessel fittings:		
(i)	pressure relief valve,		√
(ii)	vapour service shut off valve,		√
3.	recognition of supply LP and IP pressures in multi-story buildings		√
4.	types and sizing of gas regulators		√
5.	operation and positioning of ECVs		√
6.	operation and positioning of automatic changeover valves		√
7.	operation and positioning of first and second stage regulators		√
8.	identifying causes of over-pressure conditions		√
9.	operation, positioning and visible indicators (where applicable) of OPSOs		√
10.	procedures when OPSO has operated		√
11.	identification of causes of under-pressure conditions		√

12.	operation, positioning and visible indicators of UPSOs		√
13.	re-setting UPSOs		√
14.	operation and positioning of limited relief valve		√
15.	advice to consumer on re-setting UPSO		√
16.	over-pressure protection		√
17.	min. and max. acceptable outlet pressures for BS 3016 and EN 13785 regulators		√
18.	lock-up pressure for BS 3016 and EN 13785 regulators		√
19.	installation and maintenance for twin and parallel first stage regulators		√
20.	identify situation when UPSO/OPSO valve commissioning is needed		√
21.	HSL56:		
(i)	Reg. 9 Emergency Controls 9 (1) to (5)		√
(ii)	Reg. 14 Regulators 14(1) to (7)		√
22.	max. and preferred pressures for LPG Networks and service pipework		√
23.	design of pressure regulating installations		√
24.	regulators: over-pressure and under-pressure protection on LPG networks		√

3(c). Vessel and cylinder location, safety and sizing (inc. storage vessels and connections)

KNOWLEDGE AND UNDERSTANDING		REF	I
1.	types		√
2.	sizes		√
3.	marking of common vessels commercially available for single supply		√
4.	recommended off-take to match appliance demand		√
5.	safety and security for single/multiple supplies gas storage vessels and controls		√
6.	installation of vessels		√
7.	vessel location		√
8.	areas where vessels are not to be located		√
9.	vessel protection		√
10.	general construction of vessels		√
11.	general requirements of DSEAR		√
12.	accessibility and layout of vessels		√
13.	record keeping		√
PERFORMANCE CRITERIA		REF	I
External pipework			
1.	PE pipe electro-fusion jointing:		
(i)	cut PE pipe squarely; de-burr; remove shavings and scrape using appropriate tools		√
(ii)	select fusion joint; assemble and clamp onto PE pipe using appropriate equipment		√
(iii)	raise fusion fitting to correct temperature and time, using appropriate equipment		√
(iv)	remove equipment and visually examine joint		√
(v)	check work carried out is gas tight		√
2.	PE pipe - compression jointing:		
(i)	cut PE pipe squarely and de-burr using appropriate tools		√
(ii)	position tube liner within pipe		√
(iii)	position anti-shear sleeve (of correct length) in relation to joint		√
(iv)	assemble compression transitional fitting and tighten joint		√
(v)	check work carried out is gas tight		√
3.	position approved squeeze-off tool and operate on PE pipe		√
4.	select correct material for protecting PE pipe above ground		√
5.	use correct fittings and sealant for making threaded joints		√

4. Ventilation

PERFORMANCE CRITERIA		REF	I
1.	calculate free area of a selection of air bricks (inc. terracotta types) and air vents		√
2.	identify correct and incorrect types of air vents and grilles e.g. fly screens		√
3.	identify installation of inadequate ventilation in both domestic and non-domestic situations for net heat inputs ≤70 kW		√
4.	recognise suitable overhead canopy extraction		√
KNOWLEDGE AND UNDERSTANDING		REF	I
1.	ventilation for permanent dwellings (domestic):		
(i)	purpose of ventilation		√
(ii)	siting of ventilation (wall, window, floor, ceiling and ducted) direct to outside air, series air vents		√
(iii)	restrictions to ventilator/grille locations		√
(iv)	adventitious air supplies		√

(v)	calculating ventilation for flueless appliances inc.,. cooking; water heating; space heating		√
(vi)	ventilation location for single and multiple DFE space heater installations (inc. flued and flueless)		√
(vii)	additional ventilation e.g. extractor fans, cooker hoods, driers etc.		√
(viii)	calculating ventilation for combustion of domestic open flue appliances (≤ 70 kW)		√
(ix)	calculating ventilation for compartments (domestic, open, balanced and flued appliances of heat input ≤ 70 kW)		√
(x)	calculating ventilation for multi-appliance installations (multiple open flue and flueless appliances within same room/space)		√
(xi)	effects of oil or solid fuel appliances on ventilation for DFEs		√
(xii)	effects of double glazing, cavity insulation draught proofing on ventilation provision		√
(xiii)	identification and installation of in tumescent air vents		√
(xiiii)	operation of passive stack ventilation		√
(xv)	ventilation for internal kitchens		√
(xvi)	installation of appliances in cellars		√
2. ventilation for non-domestic premises:			
(i)	calculating ventilation at high and low level direct to outside air for open flue appliances of net heat input > 70 kW but ≤ 1.8 MW in plant rooms/open space		√
(ii)	calculating ventilation at high and low level direct to outside air for open flue appliances in enclosures		√
(iii)	restrictions to ventilator/grille locations for heating appliances		√
(iv)	safety interlocks between ventilation fans and gas appliances		√
(v)	calculating mechanical ventilation for heating appliances		√
(vi)	calculating individual ventilation for laundry application		√
(vii)	calculating multi-equipment ventilation for laundry applications		√
3. HSE - ventilation of kitchens in catering establishments:			
(i)	replacement air		√
(ii)	canopy performance		√
4. ventilation for LAVs:			
(i)	calculate ventilation for LAVs		√
(ii)	drop holes		√
5.	ventilation for appliances in boats – protection for low level appliances (gas detection and interlocks)		√

5. Installation of pipework and fittings (service pipework) (and alteration of existing installation pipework). Pipe sizes: copper/steel 6 mm to 28 mm, MDPE 32 mm

PERFORMANCE CRITERIA		REF	I
1.	join threaded pipe using appropriate fittings, methods and agents		√
2.	join copper pipe using appropriate compression fittings, methods and agents		√
3.	join copper tube using appropriate capillary end feed fittings, methods and agents		√
4.	connect CSST using appropriate fittings methods and agents		√
5.	replace HP hose		√
6.	fabricate LP hose using appropriate fittings, methods and agents		√
7.	use temporary continuity bond correctly		√
8.	check work carried out is gas tight		√
9.	purge pipework of air		√
10.	identify external service pipework and installation pipework safety defects		√
KNOWLEDGE AND UNDERSTANDING		REF	I
1.	types of copper, galvanized steel and PE pipe and fittings for use above and below ground (UKLPG COP 22 - Class of pipe for LPG services)		√
2.	precautions when installing underground pipework. Routing; bending; adjacent services; building connections; sleeving requirements; depth of cover; marking; recording		√
3.			
4.	using manifolds to link gas storage vessels up to and including IP		√
5.	jointing and cleaning agents for copper and galvanised steel pipework		√
6.	pipe supports, clips and fixing for copper and galvanised steel pipework		√
7.	sleeving pipework through walls/floors		√
8.	external surface mounted installation pipework		√
9.	restrictions on use of union, compression and capillary fittings		√
10.	main equipotential bonding – positioning and min. cross sectional area		√
11.	siting and installation of gas controls and isolation valves		√
12.	ducts purposely designed to contain gas pipes		√

13.	fire stopping in buildings containing flats or maisonettes		√
14.	pipework inside a protected shaft		√
15.	ventilation for protected shafts		√
16.	locations where LPG pipework is not to be installed		√
17.	pipe sizing – inc. theoretical exercise		√
18.	UKLPG COP 1 Part 2. S3, 4, 5		√
19.	UKLPG COP 22. Sections 3 to 6; Appendices 1 to 4		√
20.	labelling for LP and IP in multi-story buildings		√
21.	HSL56:		
(i)	Reg. 10 Maintaining electrical continuity		√
(ii)	Reg. 18 Safe use of pipes 18 (1) and (2)		√
(iii)	Reg. 19 Enclosed pipes 19 (1) to (3) & (5) and (6)		√
(iv)	Reg. 22 Testing and purging of pipes 22 (1) to (3)		√
(v)	Reg. 23 Marking of pipes 23 (1) and (2)		√
22.	MP and LP meter locations which do not comply with BS 6400-3		√
23.	location and sizing vent pipes on MP meter installations		√
24.	gas meters supplying mobile dwellings and boats		√
25.	where a number of primary meters serving multi-occupancy buildings are grouped together		√
26.	notices fitted to meter installations, meter housings		√

6. Tightness testing and purging (service and installation pipework)

Satisfactory completion of assessment provides evidence of competence in tightness testing of service pipework and installation pipework for PD; RPH; LAV and small non-domestic premises.

PERFORMANCE CRITERIA		REF	I
1.	test new service pipework (OP > 37 mbar propane)-using air or inert gas – as BS 5482-1 Test A.3.2		
(i)	close ECV at point of entry to dwelling		√
(ii)	isolate LPG supply and plug or cap open ends		√
(iii)	assemble pressure gauge (can be bourdon gauge); zero and connect to service pipework via an inline testing tee		√
(iv)	raise pressure in system with air or inert gas to 1.5 times OP and close pressurising source		√
(v)	allow 5 minutes stabilisation and record gauge reading		√
(vi)	test pipework for further 15 minutes		√
(vii)	observe reading. Allow no discernible pressure drop from pressure recorded in (v)		√
(viii)	where pressure has fallen, test each joint with LDF to locate leakage		√
(ix)	repair leak and repeat test from (iv) to (viii)		√
2.	carry out a let-by test for service pipework– as BS 5482-1 Test A 4.2.3		
(i)	close ECV at point of entry to dwelling		√
(ii)	close supply control valve		√
(iii)	assemble gauge; zero and connect to service pipework via an inline testing tee		√
(iv)	open supply control valve gradually until regulator locks up		√
(v)	close supply control valve		√
(vi)	release pressure slowly through test tee to open air by safe means until pressure reads approx. 5 mbar for LP or 100 mbar for IP		√
(vii)	reset UPSO if one is installed downstream of supply control valve		√
(viii)	allow 5 minutes stabilisation; read gauge and record		√
(ix)	test pipework for a further 2 minutes		√
(x)	observe reading on gauge. Allow no discernible pressure rise from pressure recorded in (viii)		√
(xi)	reset UPSO again, after the 2 minute period and prior to recording second gauge reading, if procedure in (vii) has been applied		√
3.	entire system from bulk tank outlet valve up to and including appliances - using LPG as BS 5482 - 1 Test A4.3 (service pipework no longer than 10 m and OP = 37 mbar)		√
(i)	test supply control valve for let by		√
(ii)	open all appliances isolation valves; raise cooker fold down lid and shut appliance control taps		√
(iii)	assemble pressure gauge; zero and connect to pipework via an inline testing tee		√
(iv)	open supply control valve gradually until regulator locks up		√
(v)	close supply control valve		√
(vi)	allow 5 minutes stabilisation		√
(vii)	lower pressure to 30 mbar by lighting an appliance burner and record gauge reading		√
(viii)	test installation for 2 minutes and record gauge		√

(ix)	observe reading on gauge. Allow no discernible pressure drop from pressure recorded in (vii)		√
(ii)	where pressure has fallen, test each joint with LDF to locate leakage		√
(iii)	repair leak and repeat test from (iv) to (ix)		√
4.	test IP pipework with LPG (BS 5482 - 1 A.5):		
(i)	carry out a let-by test out on tank outlet valve as A.4.2.3		√
(ii)	connect an in line test tee and attach an appropriate pressure gauge		√
(iii)	close ECV or other downstream valve to which tightness test will apply		√
(iv)	open tank outlet valve to charge service pipework to lock-up pressure		√
(v)	close tank outlet valve and slowly release gas safely through an appropriate fitting in open air until pressure reaches 80% of normal IP		√
(vi)	leave for min. of 5 minutes stabilisation and record pressure		√
(vii)	leave for 15 minutes		√
(viii)	note reading on gauge. If there is no discernible pressure drop and no smell of gas, installation is proved sound		√
(ix)	where a drop is discernible, re-pressurise system and test all visible joints with LDF; eliminate leak and repeat test from 7 (iv)		√
(x)	remove test tee; turn on tank outlet valve and test all joints in short HP section upstream of first stage regulator and other joints made after tightness test with LDF or suitable gas detector		√

KNOWLEDGE AND UNDERSTANDING		REF	I
1.	use of electronic pressure gauge (calibration)		√
2.	tightness testing external above and below ground pipework with volumes outside scope of BS 5482-1 (TM 83)		√

8. Unsafe situations, use of emergency notices and warning labels

PERFORMANCE CRITERIA		REF	I
1.	identify unsafe situations		√
2.	classify unsafe situations as ID & AR		√
3.	label unsafe appliance(s)/installation (s) appropriately		√
4.			
KNOWLEDGE AND UNDERSTANDING		REF	I
1.	explain dealing with ID installations/appliances		√
2.	explain dealing with AR installations/appliances		√
2a	explain dealing with AR installations/appliances when turning off does not remove the risk		√
3	explain dealing with situations that do not meet current standards but are not unsafe		√
4.			
5.			
6.	identify correct notices and labels to be used :		
(i)	MP gas supply		√
(ii)	warning notice forms		√
(iii)	advisory notices – appliance use, appliance shut off work in progress, electrical bonding, landlords' records		√
7.	explain reporting under RIDDOR to HSE		√
8.	HSL56: Reg. 34 Use of appliances 34 (1) to (3)		√
9.	GIUSP		
(i)			
(ii)	scope		√
(iii)	gas incidents		√
(iv)	non-domestic installations		√

12. Chimney Standards

KNOWLEDGE AND UNDERSTANDING		REF	I
1.	where solid fuel chimneys can be visually inspected without removal of an appliance:		
(i)	operation of dampers and restrictor plates		√
(ii)	suitable and unsuitable terminals for space heaters inc. radiant, inset and DFE		√
2.	open flue/chimney configurations:		
(i)	construction and operation of an open flue/chimney		√
(ii)	types of open flue/chimney material - cement based, metallic		√
(iii)	methods of jointing open flue pipe /chimney components		√
(iv)	termination positions for chimney outlets		√

(v)	ridge terminal positions		√
(vi)	restrictions on use of bends on open flues/chimneys		√
(vii)	sealed compartments for open flue appliances		√
(viii)	fan assisted open flues		√
(ix)	passive stack ventilation systems in houses, where open flue natural draught appliances are fitted		√
3.	condensing flues: plume management kits		√
4.	pre-cast flue systems:		
(i)	termination procedures for pre-cast flues		√
(ii)	flueing through loft spaces		√
5.	room sealed natural draught and fanned draught chimney configurations for appliances		
(i)	restrictions for chimney outlet positions inc. horizontal and vertical configurations		√
(ii)	restrictions on lengths, bends etc, for fanned balanced flues		√
(iii)	visual inspection of enclosing chimneys		√
(iv)	proximity of flue duct outlets to boundaries		√
(v)	identify unsafe situation ` A room sealed flue system installed within an enclosure without means of an inspection facility		√
6.	non-domestic heating appliance flueing:		
(i)	terminal types and positions for open/natural draught flues/chimneys		√
(ii)	fan diluted flues dilution/air intakes/discharge points		√
(iii)	flueing for balanced compartments		√
(iv)	appreciation of common flue or chimney requirements		√
(v)	flue dampers and stabilisers		√
7.	non-domestic catering flueing: systems for equipment (Type B appliances)		√
8.	non-domestic laundry exhaust duct:		
(i)	identify criteria to calculate individual exhaust duct requirements		√
(ii)	siting of exhaust ducts and preferred termination procedures		√
9.	flueing standards for LAVs		
(i)	termination positions for open flues		√
(ii)	restrictions for balanced flue termination positions		√
10.	HSL56:		
(i)	Reg.27 Flues (1) to (4)		√
(ii)	Reg.30 Room-sealed appliances (1) to (3)		√
(iii)	Reg.32 Flue dampers (2) and (3)		√

13. Re-establish existing gas supply and relight appliances/plant

PERFORMANCE CRITERIA		REF	I
1.	check installation is gas tight		√
2.	re-establish gas supply		√
3.	check appliance(s) visually and re-light inc.:		
(i)	purge system and appliances of air		√
(ii)	re-light appliance(s)		√
(iii)	confirm satisfactory operation of user controls		√
(iv)	inspect appliance installation(s) visually for unsafe situations		√
KNOWLEDGE AND UNDERSTANDING		REF	I
1.	describe action when an un-commissioned appliance is identified		√
2.	confirm actions if pipework and appliance(s) are not tested (commissioned) when gas supply is re-established		√
3.	HSL56: Reg.33 Testing of appliances 33(1) to (3)		√
4.	Actions required where fumes, smells or spillage have been reported/encountered	BS7967 2015 6.1	√