

TEST REQUIREMENTS FOR PIPELINES, MAINS, SERVICES, INSTRUMENT LINES SUBJECTED DIRECTLY TO GAS PRESSURES, AND OTHER FACILITIES

DESIGN PRESSURE (D.P.)	300 S.M.Y.S. OR MORE		UNDER 300 S.M.Y.S. AND OVER 100 P.S.I.	100 P.S.I. TO 1 P.S.I. OR LESS	PLASTIC (SEE NOTE 9)
	PIPELINE (INCLUDING FABRICATED UNITS TESTED IN PLACE)	FABRICATED UNITS, SHORT SECTIONS OF PIPE, PRETESTED PIPE (SEE NOTE 5 FOR LIMITATION)	INCLUDING FABRICATED UNITS AND SHORT SECTIONS OF PIPE, EITHER PRE-TESTED OR TESTED IN PLACE.		
TYPE OF TEST	STRENGTH	STRENGTH	LEAK	LEAK	STRENGTH
TEST MEDIUM	WATER, AIR, INERT GAS OR GAS (SEE NOTES 1, 14, 2) and 14)	WATER, AIR, INERT GAS OR GAS (SEE NOTES 1, 14, 2) and 14)	WATER, AIR, INERT GAS OR GAS (SEE NOTES 1, 14, 2) and 14)	AIR OR GAS (See Note 14)	AIR OR GAS (See Note 14)
MAXIMUM TEST PRESSURE (SEE NOTES 1 AND 2)	100% S.M.Y.S. OR FACTORY TEST PRESSURE OF FITTING (SEE NOTES 3 AND 4)	100% S.M.Y.S. OR FACTORY TEST PRESSURE OF FITTING (SEE NOTES 3 AND 4)	(SEE NOTES 3 & 11)	110 P.S.I.	3 X DESIGN PRESSURE
MINIMUM TEST PRESSURE	1.5 X DESIGN PRESSURE (SEE NOTE 4)	1.5 X DESIGN PRESSURE (SEE NOTE 4)	1.5 X DESIGN PRESSURE	100 P.S.I.	100PSI (SEE NOTE 13) OR 1.5 X W.A.O.P. WHICHEVER IS GREATER
DURATION OF TEST	8 HOURS MINIMUM	4 HOURS MINIMUM	1 HOUR MINIMUM	5 MINUTES	5 MINUTES (SEE NOTE 6)
TEST RECORDS REQUIRED (SEE NOTE 12)	FORMS REQUIRED	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETE BOX ON W.O. FORM OR GAS SERVICE RECORD FORM	COMPLETE BOX ON W.O. FORM OR GAS SERVICE RECORD FORM
	TEST CHART	YES (SEE NOTE 8)	YES (SEE NOTE 8)	NO (SEE NOTE 10)	NO (SEE NOTE 10)

- NOTES: (1) MAXIMUM TEST PRESSURE PERMITTED, EXPRESSED AS A PERCENT OF S.M.Y.S. -
- | | | | | |
|------------------|----|----|----|-----------------|
| LOCATION CLASS | 1 | 2 | 3 | 4 |
| AIR OR INERT GAS | 80 | 75 | 50 | 40 (SEE NOTE 7) |
| GAS | 80 | 30 | 30 | 30 |
- WATER - SEE ABOVE
- (2) SAFETY - WHEN TESTING WITH AIR, INERT GAS OR GAS, THE PRESSURE SHALL BE HELD AT ABOUT 100 P.S.I. AND OBSERVED FOR LEAKAGE BEFORE RAISING TO THE REQUIRED TEST VALUE.
- (3) MAXIMUM TEST CAPABILITIES OF FITTINGS SUCH AS VALVES AND ELBOWS MUST BE EXAMINED WHEN TESTING.
- (4) IT IS THE INTENT TO TEST ALL FACILITIES DESIGNED TO OPERATE AT OVER 500 S.M.Y.S. AT A PRESSURE OVER 90% OF S.M.Y.S. AND AS CLOSE TO S.M.Y.S. AS PRACTICAL. THERE MAY BE INSTANCES, AS IN ITEM 3, WHERE PRESSURE SHALL BE LIMITED, BUT IN NO CASE SHALL IT BE LESS THAN 1.25 D.P. EXCEPT CLASS 1 CONSTRUCTION, WHICH IS 1.25 D.P. FACILITIES TO OPERATE AT UNDER 500 S.M.Y.S. SHALL BE TESTED TO A MINIMUM OF 1.5 X D.P. FOR FACILITIES OPERATING AT 400 TO 500 OF S.M.Y.S., CONSIDERATION SHOULD BE GIVEN TO TESTING TO OVER 90% OF S.M.Y.S., IF THERE IS A POTENTIAL FOR HIGH RISE CONSTRUCTION. HOWEVER, SUCH TESTING IS NOT AN ALTERNATIVE FOR CONSTRUCTION OF NEW OR REPLACEMENT FACILITIES TO MEET EXPECTED FUTURE LOCATION CLASS REQUIREMENTS (SEE PAGE 2, PAR. 7 OF THIS STANDARD).
- (5) ALL FACILITIES DESIGNED TO OPERATE AT 300 OR MORE OF S.M.Y.S. SHALL BE TESTED AS A UNIT FOR A MINIMUM OF EIGHT HOURS, AFTER INSTALLATION, EXCEPT FOR FABRICATED UNITS OR SHORT SECTIONS OF REPLACEMENT PIPE FOR WHICH A POST INSTALLATION TEST IS IMPRACTICAL. FABRICATED UNITS FOR WHICH A POST INSTALLATION TEST IS IMPRACTICAL, SHALL BE TESTED AFTER COMPLETION AND BEFORE INSTALLATION, FOR A MINIMUM OF FOUR HOURS. THIS TEST IS REQUIRED EVEN THOUGH PRETESTED PIPE WAS USED TO FABRICATE THE UNIT. SHORT SECTIONS OF REPLACEMENT PIPE SHALL BE TESTED FOR A MINIMUM OF FOUR HOURS, PRIOR TO INSTALLATION. THIS TEST MAY BE CONDUCTED IMMEDIATELY PRIOR TO INSTALLATION, OR BY PRETESTING THE PIPE AND RETAINING IT FOR EMERGENCY USE. FOR GAS STANDARD A-34, THE FOLLOWING DEFINITIONS SHALL APPLY:
- (a) A SHORT SECTION OF PIPE IS DEFINED AS ONE PIPE LENGTH OR LESS.
- (b) A FABRICATED UNIT SHALL CONSIST OF TWO OR MORE FITTINGS AND/OR PIECES OF PIPE JOINED TOGETHER. WHERE MORE THAN 40 FEET OF PIPE IS INVOLVED, THERE SHALL BE A FULL EIGHT HOUR TEST.
- FOR EMERGENCY REPAIRS, SOME EXCEPTIONS MAY BE PERMITTED, BUT ONLY WITH THE APPROVAL OF THE GAS SYSTEM DESIGN DEPARTMENT.
- (6) HOLD AT TEST PRESSURE FOR AS LONG AS PRACTICAL. IF NOT GASSED UP IMMEDIATELY FOLLOWING TEST, RETEST BEFORE GASSING UP.
- (7) AIR OR INERT GAS SHOULD NOT BE USED TO TEST AT OVER 500 S.M.Y.S. UNLESS A TEST WITH WATER IS COMPLETELY IMPRACTICABLE. WHEN IT IS NECESSARY TO USE AIR OR INERT GAS AT OVER 500 S.M.Y.S., BUILDINGS WITHIN 300' OF PIPELINE MUST BE EVACUATED.
- (8) TEST CHARTS MUST BE COMPLETED AND RETAINED AS OUTLINED IN A-34, PAGE 3.
- (9) TEMPERATURE OF THERMOPLASTIC MATERIAL MUST NOT BE MORE THAN 100°F DURING THE TEST.
- (10) TABLE INDICATES TEST CHART REQUIREMENTS FOR NEW FACILITIES. TEST CHARTS ARE REQUIRED FOR ALL UPGRADING JOBS, NO MATTER WHAT THE OPERATING PRESSURE OF THE LINE.
- (11) FOR FACILITIES OPERATING AT UNDER 300 S.M.Y.S. AND OVER 100 P.S.I., THE MAXIMUM TEST PRESSURE IS TO BE DETERMINED BY THE PROJECT ENGINEER. A REASONABLE DIFFERENTIAL BETWEEN MAXIMUM AND MINIMUM TEST PRESSURES SHOULD BE ALLOWED, CONSIDERING ELEVATION DIFFERENTIALS AND NOTE 3.
- (12) ALL TEST RECORDS MUST BE RETAINED FOR THE LIFE OF THE FACILITY.
- (13) SIZE 21 PIPE TO BE TESTED TO 50 P.S.I.G. MINIMUM.
- (14)

APPROVED	DATE	DESCRIPTION	BY	CH.	APPD.
	1-13-77	Added "Instrument Lines Subjected Directly to Gas Pressure" to Title of Chart		C.A.	H.F.
	1-14-77	Added Section 2, Note 3, and 14 to Fabricated Units		C.F.	H.F.
	5-10-77	Added Note 13		H.F.	A.N.K.
	2-17-72	Revised Title For Convolver Listing, Change To 30 S.M.Y.S. & Note 4			
	6-24-72	Revised Chart to Show Required Test Forms, Added Notes 11 & 12 and Footnote			
	11	Max. Test for 100 P.S.I. to 300 S.M.Y.S. & 1 to 100 P.S.I. Change from 1.5 D.P. to 100 P.S.I.		A.C.	A.N.K.
	10-14-79	Revised Note 8			

SUPV. BY	DSGN.	DR.	CH.	O.K.	DATE	SCALE
					2-11-69	NONE

PIPING — DATA SHEET
DESIGN AND TEST REQUIREMENTS
 GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

SUPERSEDES OB 4509	SUPERSEDED BY	SHEET NO. 4 OF 4 SHEETS
		DRAWING NUMBER
		283621
		CHANGE
		10

11 ADDED NOTE 14.

Please revise by 7-25

- c. See Gas Standard A-55.1 for plastic service lines and plastic inserts.
- d. All service lines that have been struck and/or damaged in above-ground incidents shall be leak surveyed with a leak detector. The survey shall include the service line adjacent to the customer's building and/or other areas as appropriate.

RECORDS

- 15. a. For facilities operating above 100 P.S.I., estimate sketches and design drawings shall contain the following information: Where more than one size or type of pipe is involved, the Required information shall be supplied for each size or type. Where several sizes are involved the information should be provided in Tabular Form.
- b. Leak Test information shall be recorded on the gas service record, the estimate sketch, and work order or other authorized form for facilities operating under 100 P.S.I.G.
- c. Estimate Form 62-6251 shall be marked by person making estimate to indicate that the pipe is over 30% yield and has to be strength tested.

STRENGTH TEST PRESSURE REPORT

- 16. A Strength Test Pressure Report (Form 62-4921) is required for each facility operating at over 100 P.S.I.G. (See Appendix A).
- a. Part I of the Strength Test Pressure Report shall be filled out by the Project Engineer or the Gas System Design Department.
- b. Part II of the Strength Test Pressure Report shall be filled out by the person supervising the test in the field at the time the test is performed.
- c. A copy of the completed Strength Test Pressure Report shall be filed with the completed Foreman's Copy of the Estimate, along with a copy of the Test Chart (where required). These shall be retained for the life of the facility. Distribute other copies as indicated on the form.

TEST CHART

- 17. A Chart Record shall be made of the Pressure Test for new facilities to operate at over 30X S.M.Y.S. and for all lines or systems being worked. The procedure for handling the Chart, and the minimum information required on the Chart is outlined below:
 - a. The Chart must be designed for the recorder on which it is to be used, and must have appropriate scale and time lines.
 - b. The calibration of the recorder must have been checked.
 - c. The Chart must be set on the correct time at the start of the test. The actual time, date, and initials of the person starting the test must be shown on face of Chart at the start of the test.
 - d. The Chart must show a minimum of eight hours (except where four hours test is permitted in Appendix A.). Any discrepancies should be explained.
 - e. At the end of the test, the actual time, date, and initials of the person removing the Chart must be shown on the face of the Chart.
 - f. The section of pipe under test must be identified on the face of the Chart, along with the Job Number.
 - g. The following additional information is to be shown on the back of the Chart:
 - i. Job Number
 - ii. Location of test.
 - iii. Test Pressure, date and duration.
 - iv. Size, wall thickness, pipe specification and length of section tested.
 - v. The serial number of the recorder or other means of identification.
 - vi. The date the recorder was last calibrated and s/n of the dead weight tester used.
 - h. The above information is to be recorded on the Chart at the time of the test. After the test is completed, the foreman is to review the Chart and then sign and date it.
 - i. The original of the Test Chart is to be attached to the original of the Test Report Form 62-4921. A copy of the Test Chart is to be attached to each copy of the Test Report. This Record is to be retained for the life of the facility.

TEST RECORDS FOR FACILITIES OPERATING AT UNDER 100 P.S.I.G.

- 18. For each facility operating at under 100 P.S.I.G., the Leak or Pressure Test information shall be recorded in a Box provided on the Work Order Form or the Gas Service Record Form. If these documents are not used, the Test information shall be recorded on the As-built Copy of the Construction drawing. The Test Record shall be retained for the life of the facility.

APPROVED	DATE	DESCRIPTION	BY	CR.	APPD.
<i>[Signature]</i>	4-1-72	Retyped due to expansion of Par 14.			
<i>[Signature]</i>	3-20-74	Added Paragraph 18.	A.C.	A.K.K.	M.W.
<i>[Signature]</i>	2-1-75	Paragraph 15 Revised. Paragraph 14 and 17 Added. Drawing Reference.	A.R.R.	A.C.	M.W.
<i>[Signature]</i>	1-1-77	Revised Title For Computer Layout & Revised Design Equips.			

SUPV. BY DSGN. DR. A. N. KHAZEFF CH. BY O.K. <i>[Signature]</i>		PIPING — DATA SHEET DESIGN AND TEST REQUIREMENTS GAS STANDARD PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		SUPERSEDES CB4509 SHEET NO. 3 OF 4 SHEETS DRAWING NUMBER 283621	
DATE 2-11-69	SCALE NONE			CHANGE 4	