



FIRE DEPARTMENT- CLASS 1 • FIRE AND ENVIRONMENTAL PROTECTION DIVISION
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**PLAN CHECK REQUIREMENTS FOR
PYROPHORIC AND SELF-DETONATING GASES
(Update – 1/17)**

The Fire and Environmental Protection Division of the Mountain View Fire Department (650-903-6378) will review your submitted plans using this plan check guideline.

Where appropriate, enter below the page number of your submitted plans where the item asked for is indicated and highlight the item in your plans. Include brochures, manufacturer's cut sheets, and calculations with the plans when asked for.

Facility
Name: _____ Address: _____

Architect
Name: _____ Phone: _____ PC#: _____ Date: _____

Applies To: Storage, dispensing, and use of silane and other pyrophoric gases and mixtures with a concentration of 2 percent or more by volume where the total quantity of pyrophoric gases within a control area exceeds 50 cubic feet in storage (100 cubic feet if stored in cabinets) or 10 cubic feet in use-closed system (20 cubic feet if stored in cabinets).

A. General

- 1. Containers, cylinders, and tanks shall be equipped with restrictive-flow orifices not exceeding 0.01" (0.254 mm) in diameter (CFC 6405.3). Plan Page Number: _____.
- 2. Presence of restrictive-flow orifice shall be indicated on each valve and on each container, cylinder, and tank by means of a label (CFC 6405.3). Plan Page Number: _____.
- 3. Container, cylinder, and tank valves shall be constructed of stainless steel or other approved materials (CFC 6405.3). Plan Page Number: _____.
- 4. Signs prohibiting smoking shall be posted within pyrophoric gas use/dispensing areas (CFC 5003.7.1). *Show these locations on the plans.* Plan Page Number: _____.

- 5. Visible hazard identification signs as specified in NFPA 704 shall be placed at entrances to locations where hazardous materials are stored, dispensed, used, or handled in quantities requiring a permit. (NOTE: Silane hazard ratings are Health = 2, Fire = 4 and Reactivity = 3.) Rooms or cabinets containing compressed gases shall be conspicuously labeled "COMPRESSED GAS" (CFC 5003.5). Indicate the locations for sign placement on the plans. Plan Page Number: _____.
- 6. Persons responsible for the operation of areas in which hazardous materials are stored shall be familiar with the chemical nature and the appropriate mitigating actions necessary in the event of a leak or fire (CFC 5003.9.1). Call out on the plans a list of on-site personnel in charge of the storage and use of the pyrophoric gases. Plan Page Number: _____.
- 7. Pyrophoric gas storage, dispensing, and use areas shall be secured against unauthorized entry and safeguarded with such protective facilities as public safety requires (CFC 5003.9.2; MVCC 24.3.3). Indicate the type of securement provided on the plans. Plan Page Number: _____.
- 8. Equipment and associated piping shall be listed by a nationally recognized organization (5003.2.2.1, 5003.2.2.2). Attach manufacturer's cut sheets on all equipment and piping showing UL or other listing.
- 9. Piping shall be identified with product name and marked with the direction of flow (MVCC 24.3.9(d)(1)). Indicate labeling to be used on the plans. Plan Page Number: _____.

B. Indoor Storage and Use, Outdoor Use

- 1. Electrical wiring and equipment in storage areas shall comply with Electrical Class I, Division 2, requirements (CFC 5803.1.5). Show this on the plans. Plan Page Number: _____.
- 2. Pyrophorics shall be isolated from other incompatible hazardous materials by one-hour fire-resistive walls (with openings protected in accordance with the Building Code) or hazardous materials storage cabinets (CFC 6404.1.4). Show the fire-resistive walls or gas cabinets on the plans. Plan Page Number: _____.
- 3. When gas cabinets/exhausted enclosures are provided, they shall meet the following requirements:
 - Internally sprinklered;
 - Average ventilation velocity across the access port shall be not less than 200 linear feet per minute with a minimum velocity of 150 linear feet per minute;
 - Connected to an exhaust system;
 - Provided with self-closing doors;
 - Constructed of not less than 12 gauge steel.

(CFC 6004.1.2, 6004.1.3). Indicate this on the plans. Plan Page Number: _____.

4. Exhaust ventilation shall comply with the following:
- Operate at a rate of not less than one cubic foot per minute per square foot of floor areas over the storage area;
 - Operate continuously;
 - Not be recirculated within the room or building;
 - Provided with a manual shutoff outside the room adjacent to the door. The shutoff shall be of the break-glass type and labeled "VENTILATION SYSTEM EMERGENCY SHUTOFF."

(CFC 5004.3.1). *Include schematics of the exhaust system showing compliance with the above items on the plans.* Plan Page Number: _____.

5. Indoor storage areas and storage buildings and indoor rooms or areas in which hazardous materials are dispensed shall be protected by an automatic sprinkler system designed not less than that required for Ordinary Hazard Group 2 with a minimum design area of 3,000 square feet (CFC 5004.5). *Show the locations of the sprinkler heads and attach sprinkler calculations to the plans.* Plan Page Number: _____.
6. Explosion control shall be provided (5004.6). *Show the explosion control on the plans.* Plan Page Number: _____.
7. Mechanical ventilation, treatment systems, gas detection, and alarm systems shall be connected to a secondary source of power to automatically supply electrical power in the event of loss of power from the primary source (CFC 5004.7). *Show the electrical schematics for the back-up power and how it is tied into these systems on the plans.* Plan Page Number: _____.
8. Emergency alarms (pull stations) shall be provided outside of each interior exit door of the storage room or area which initiate a local audible and visual alarm (MVCC 24.645). *Show the type and locations of pull stations on the plans.* Plan Page Number: _____.
9. Emergency alarms, leak detection alarms, and fire-extinguishing systems shall be supervised by an approved central, proprietary, or remote station service or will initiate an audible and visual signal at a constantly attended on-site location (MVCC 24.515). *Provide the name and phone number of the central station if off-site from this facility. Otherwise, show the location of the on-site monitoring station on the plans.* Plan Page Number: _____.
10. Dedicated inert purge cylinders shall be located within the same gas cabinets as the pyrophoric gas (MVCC 24.715). *Show the purge cylinders on the plans.* Plan Page Number: _____.
11. Purging shall be performed by means ensuring complete purging of the piping and control system (i.e., through auto purge or other approved equivalent) (MVCC 24.715). *Identify the means by which purging will be accomplished.* Plan Page Number: _____.
12. Machinery and equipment utilizing pyrophoric gases shall be seismically anchored in accordance with the Building Code (MVCC 24.225). *Identify all tools using the pyrophoric gases and show the seismic anchoring.* Plan Page Number: _____.

13. When low-melt-point materials, such as aluminum, copper, some brass alloys, or nonmetallic materials are used for piping systems, conveying pyrophoric gases, such as piping systems, shall be protected with one of the following:
- Isolation from fire exposure by fire-resistive construction or other approved means;
 - Isolation from fire exposure by gas cabinets;
 - Protected from fire exposure by an automatic fire-extinguishing system;
 - Located so that any release resulting from failure of the piping systems will not unduly expose persons, buildings, or structures; or
 - Provided with a readily accessible shutoff valve or valves which will shut off the source of gas to the piping system in the event of leakage.

(CFC 5003.2.2). *Indicate the materials of construction for all piping and if low-melt-point materials are being proposed, the protection that will be provided meeting the requirements above.* Plan Page Number: _____.

14. The gas system shall be provided with emergency shutoffs at each pyrophoric gas source and at each tool (CFC 6403.1.1). *Show the locations of the shutoffs on the plans.* Plan Page Number: _____.
15. All piping and tubing, as well as emergency shutoff valves, shall be identified with clearly visible signs (MVCC 24.3.9). *Indicate this on the plans.* Plan Page Number: _____.
16. Floors of storage areas shall be made of noncombustible construction (CFC 8003.1.13, CFC 5004.12). *Indicate the floor construction type on the plans.* Plan Page Number: _____.
17. The perimeter surrounding an outdoor dispensing or use area shall remain clear of combustible materials and vegetation for a minimum of 30' (CFC 5003.3.8). *Indicate this on the plans.* Plan Page Number: _____.
18. Leak detection systems (e.g., heat or UV sensors or approved alternatives) shall be provided at each source and at the tool (MVCC 24.3.0(m)(1)). Plan Page Number: _____.

C. Outdoor Storage

(Note: When overhead noncombustible construction is provided for sheltering outdoor cylinder storage areas, such storage areas shall be considered indoor storage and Section B requirements, above, shall apply.)

1. "Detached storage" provided if aggregate quantity of pyrophoric gas exceeds 2,000 cubic feet. ("Detached storage" means a building used for no other purpose, which does not exceed one story in height and which has no basements, crawl spaces or other underfloor spaces) (CFC Table 5003.8.2). Plan Page Number: _____.
2. Smoking shall be prohibited within 25' of outside storage areas (CFC 5003.7.1). *Indicate location of "No Smoking" signage on the plans.* Plan Page Number: _____.
3. The perimeter surrounding the outdoor storage area shall remain clear of combustible materials and vegetation for a minimum of 25' (CFC 5004.11). *Indicate this on the plans.* Plan Page Number: _____.

- 4. Floors of storage areas shall be made of noncombustible construction (CFC 5004.12). *Indicate the floor construction type on the plans.* Plan Page Number: _____.
- 5. When overhead construction is provided for sheltering of outdoor storage/use of pyrophoric materials, the area shall be provided with an approved automatic fire extinguishing system (CFC 6404.2.2). *Indicate this on the plans.* Plan Page Number: _____.
- 6. The location and maximum amount of pyrophoric gases per storage area shall be in accordance with CFC Table 6404.2.1 below:

PYROPHORIC GASES – DISTANCE FROM STORAGE TO EXPOSURES
(CFC Table 6404.2.1)

Maximum Amount Per Storage Area (cubic feet)	Minimum Distance Between Storage Areas (feet)	Minimum Distance to Property Lines That Can Be Built Upon (feet)	Minimum Distance to Streets, Alleys, or Public Ways (feet)	Minimum Distance to Building on the Same Property (feet)		
				Nonrated or Openings with 25'	Two-Hour and No Openings within 25'	Four-Hour and No Openings within 25'
250	5	25	5	5	0	0
2,500	10	50	10	10	5	0
7,500	20	100	20	20	10	0

Show the relevant distances on the plans. Plan Page Number: _____.