# Incinerator Systems NFPA 82
## Inspection Form

## PART 1 INCINERATORS
### DESIGN AND CONSTRUCTION

<table>
<thead>
<tr>
<th>AUXILIARY FUEL</th>
<th>Question</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are gas-burning installations designed in accordance with NFPA 54 for fuel gas and NFPA 58 for Liquified Petroleum, where applicable?</td>
<td></td>
<td>NFPA 82: 4.1.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTRICAL SUPPLY</th>
<th>Question</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the electrical supply installed in accordance with NFPA 70?</td>
<td></td>
<td>NFPA 82: 4.1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AIR FOR COMBUSTION AND VENTILATION</th>
<th>Question</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is air supply to room adequate for operation?</td>
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<tr>
<td>2. If fans are used for supply, are they arranged to operate whenever the incinerator is in operation?</td>
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<tr>
<td>3. Is the air taken from the exterior or, if from another area of the building, is the opening protected by a fire damper?</td>
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<tr>
<td>4. Is ductwork used for air supply designed in accordance with NFPA 90A?</td>
<td></td>
<td>NFPA 82: 4.1.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPARK ARRESTERS</th>
<th>Question</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If the waste produces fly ash emissions, is the stack equipped with spark arresters, a wet scrubber, or other approved feature to prevent entrainment of fly ash to the stack under normal operating conditions?</td>
<td></td>
<td>NFPA 82: 4.1.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSTRUCTION</th>
<th>Question</th>
<th>Requirement</th>
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</thead>
<tbody>
<tr>
<td>1. Is the incinerator designed such that</td>
<td></td>
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<tr>
<td>a. Combustion only takes place within the chamber, not in the breaching or chimney?</td>
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<tr>
<td>b. Positive pressure incinerators are gas-tight?</td>
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<tr>
<td>c. It withstands combustion temperatures under all temperature conditions?</td>
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<td></td>
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<tr>
<td>d. Exterior casing reinforced with structural steel?</td>
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<td></td>
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<tr>
<td>e. Openings are provided so all parts of incinerator can be cleaned?</td>
<td></td>
<td></td>
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<tr>
<td>f. Openings for cleanout are protected by tight-fitting doors or covers are securely latched and held closed?</td>
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<td></td>
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<tr>
<td>g. Ash pit and combustion changer closures and frames are of cast iron or equivalent, with frames securely attached to the incinerator?</td>
<td></td>
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<tr>
<td>2. Is any part of the incinerator used as a wall, roof, or floor of a building?</td>
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<td></td>
</tr>
<tr>
<td>3. Are external surface temperatures limited to 71.1 degrees C (160 degrees F) using other than external insulation?</td>
<td></td>
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</tr>
<tr>
<td>4. Are temperatures of handles to doors limited to 4.4 degrees C (40 degrees F) if metallic, otherwise 15.6 degrees C (60 degrees F)?</td>
<td></td>
<td>NFPA 82: 4.2.1</td>
</tr>
</tbody>
</table>
EXPLOSION RELIEF

1. Is explosion relief provided?

2. Is the explosion vent area not less than 0.09 m² (1 ft²) of relief area for every 3 m³ (100 ft³) of primary combustion chamber volume?

3. If chimney is not used for this purpose, is the door that is used designed to return to a closed position after relief?

4. Are explosion relief devices not closer than 90 degrees in side elevator or plan view to the normal operator position?

5. Are explosion-relief devices located in areas not generally accessible to normal personnel activities and guarded and posted with safety signs indicating a warning of the vent area?

NFPA 82: 4.2.2

PLACEMENT

1. Are incinators placed on masonry foundation having a rating of at least 3 hrs?

2. Are combustion chambers elevated above concrete-bearing surfaces via pedestals, cradles, skids or other means, to provide a minimum of 101.6 mm (4 in.) clear air circulation?

NFPA 82: 4.2.3

CLEARANCES

1. Are incinerators installed to provide a clearance to combustible material as follows:
   a. Sides and rear – at least 914 mm (36 in.) (If encased in brick, can be reduced to 457 mm (18 in.).)
   b. Above – at least 1220 mm (48 in.) (If encased in brick, can be reduced to 914 mm (36 in.).)
   c. Front - at least 2.4 m (8 ft)?

2. Are incinerators installed to provide a clearance to noncombustible material of at least 305 mm (12 in.) (Can be reduced to 76.2 mm (3 in.) where physically impossible)?

3. Do clearances provided allow access for maintenance and normal operations?

4. Are all noncombustible structural members 610 mm (24 in.) wide or less, parallel to the incinerator, at least 152 mm (6 in.) from the incinerator?

NFPA 82: 4.2.4

CHARGING

1. Does the waste charging operation prevent direct discharge of flames, gases and heat from the incinerator during loading operations?

2. Is the combustion chamber charged from the same floor level as the chamber?

3. Is the charging hood and chute at least 12 U.S. gauge steel casing and lined with not less than 114 mm (4½ in.) of firebrick?

4. Is the charging hopper limited in length to 1.8 m (6 ft)?

5. Is the charging opening protected with a cover of at least 63.5 mm (2½ in.) refractory material that extends on all sides of the opening for at least 51 mm (2 in.)?

6. Is the charging floor opening located in a room enclosed in at least 2-hr fire-rated construction with 3-hr automatic or self-closing opening protection?

7. Are doors to the charging room normally closed?

NFPA 82: 4.2.5
### PART 2  CHIMNEYS FOR INCINERATORS

#### GENERAL

<table>
<thead>
<tr>
<th>DESIGN STANDARDS</th>
<th>1. Does the chimney meet the requirements of NFPA 211?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NFPA 82: 4.3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPORTS</th>
<th>1. Is chimney supported on properly designed foundation of concrete?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. If masonry chimney is supported on noncombustible material, does the material have a 3-hr fire rating and are supports independent of the building construction?</td>
</tr>
<tr>
<td></td>
<td>3. If chimney is factory built or metal and supported by the building construction, are expansion joints provided at each support level and are joints liquid-tight?</td>
</tr>
<tr>
<td></td>
<td>NFPA 82: 4.3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLEANOUT OPENINGS AND DRAINS</th>
<th>1. Are cleanout openings equipped with ferrous doors?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Are doors arranged to remain tightly closed when not in use? Is there a clearance of not less than 914 mm (36 in.) between cleanout doors and combustible material?</td>
</tr>
<tr>
<td></td>
<td>3. Are drains provided at the base of all chimneys to allow removal of condensed flue products and to avoid clogging?</td>
</tr>
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<td></td>
<td>NFPA 82: 4.3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BREACHINGS</th>
<th>1. Are breachings designed or protected by guard rails or shields to protect personnel from accidental contact?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Are hot breachings free of external insulation?</td>
</tr>
<tr>
<td></td>
<td>NFPA 82: 4.3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LISTED MEDIUM-HEAT CHIMNEYS</th>
<th>1. If listed medium-heat chimneys are used, are they installed in accordance with their listing and the manufacturer’s instructions?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NFPA 82: 4.3.2</td>
</tr>
</tbody>
</table>

### METAL CHIMNEYS

<table>
<thead>
<tr>
<th>CONSTRUCTION</th>
<th>1. Are service openings located within a room or compartment separated from other parts of the building?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Are metal chimneys constructed of steel or cast iron?</td>
</tr>
<tr>
<td></td>
<td>3. Is steel construction of an adequate thickness based on Table 4.3.3.2?</td>
</tr>
<tr>
<td></td>
<td>NFPA 82: 4.3.3</td>
</tr>
</tbody>
</table>
LINING
1. Are chimneys adequately lined, based on their combustion temperatures, as follows:
   a. 982 degrees C (1800 degrees F) or less – Firebrick with high-duty refractory mortar
   b. Greater than 982 degrees C (1800 degrees F) – Super-duty spall-resistant refractory brick laid in refractory mortar
2. Does lining start at the base of the chimney and continue to the top?
3. If alternative lining is used, is it equivalent in heat and corrosion resistance?
   NFPA 82: 4.3.3

SUPPORTS
1. Are metal chimneys properly riveted, welded, or bolted and securely supported as follows:
   a. Strength to resist stresses due to wind?
   b. Anchoring, bracing, and strength to withstand seismic and wind-induced vibrational stresses?
   c. Proper material thickness for durability?
   d. Security against leakage of flue gasses under positive pressure?
   e. Allowance for thermal expansion of breaching and vertical sections?
   NFPA 82: 4.3.3

ENCLOSURE
1. If metal chimney extends through other floors of the building, is it adequately enclosed in fire-rated construction as follows:
   a. Is rating 1-hr for 3 stories or less?
   b. Is rating 2-hrs for 4 stories or more?
2. Is adequate space provided between chimney and enclosure to allow for inspection, with a minimum of 305 mm (12 in.) on all sides?
3. Is the enclosure without openings, except for those required for inspections and adequately protected by opening protectives of the appropriate fire rating?
   NFPA 82: 4.3.3

MASONRY CHIMNEYS
CONSTRUCTION
1. If temperature does not exceed 982 degrees C (1800 degrees F), are the walls constructed of solid masonry units or reinforced concrete with walls greater than 203 mm (8 in.) thick?
2. If temperature exceeds 982 degrees C (1800 degrees F), are the walls constructed with double walls of solid masonry units or reinforced concrete?
3. Are the double walls both greater than 203 mm (8 in.) thick with at least 51 mm (2 in.) between them?
   NFPA 82: 4.3.4
LINING

1. If the temperature does not exceed 982 degrees C (1800 degrees F) is the lining protected as follows:
   a. Are the walls lined with 114 mm (4½ in.) high duty spall-resistant fire brick (as defined by ASTM C27, Standard Classification of Fireclay and High-Alumina Refractory Brick) and laid in high-duty refractory mortar (as defined in ASTM C199, Standard Test Method for Pier Test for Refractory Mortar)?
   b. Does the lining start at the base of the chimney and extend continuously to the top?

2. If the temperature does not exceed 982 degrees C (1800 degrees F), is the lining protected as follows:
   a. Are the walls lined with 114 mm (4½ in.) super duty spall-resistant fire brick (as defined by ASTM C27) and laid in super-duty refractory mortar (as defined in ASTM C 27)?
   b. Does the lining start at the base of the chimney and extend continuously to the top?

3. Has the masonry chimney been proven to be airtight by a smoke test after erection and before being put into service?

CHIMNEY CLEARANCES

MANUFACTURER INSTRUCTIONS

1. Is the listed chimney installed in accordance with the conditions of the manufacturer's instructions for clearances?

EXPOSED SURFACES

1. Are the exposed surfaces of the chimney (any part or breaching that can be touched) designed so that maximum surface temperature does not exceed 39 degrees C (70 degrees F) above ambient temperature?

MASONRY

1. Is the clearance between the exterior surface of the chimney and any combustible material greater than 102 mm (4 in.)?

EXTERIOR METAL

1. Is the clearance between the exterior surface of the metal chimney and a wall of wood frame construction or any combustible material greater than 610 mm (24 in.)?
   2. If the exterior metal chimney is more than 457 mm (18 in.) in diameter, is the clearance between the chimney and any building wall other than wood construction greater than 102 mm (4 in.)?
   3. If the chimney is 457 mm (18 in.) in diameter or less, is the clearance between the chimney and any building wall other than wood construction greater than 51 mm (2 in.)?
   4. If the metal chimney is installed without shielding to prevent a person from coming into contact with the chimney, is the clearance between the chimney and any door, window or walkway greater than 610 mm (24 in.)?
INTERIOR METAL

1. On the same story of a building as that in which an incinerator is located, is the clearance between the interior metal chimney and a wall of wood construction or any combustible material greater than 914 mm (36 in.)?

2. If the interior metal chimney is more than 457 mm (18 in.) in diameter, is the clearance between the chimney and any building wall other than wood construction greater than 102 mm (4 in.)?

3. If the interior metal chimney is 457 mm (18 in.) in diameter or less, is the clearance between the chimney and any building wall other than wood construction greater than 51 mm (2 in.)?

4. If the interior metal chimney passes through a roof constructed of combustible material, is it guarded by a ventilated thimble of galvanized iron or approved corrosion-resistant metal and arranged such that:
   a. It is extended at least 229 mm (9 in.) both below and above the roof construction?
   b. It has a clearance of at least 457 mm (18 in.) on all sides of the chimney?

   NFPA 82: 4.3.5.4

LOW-TEMPERATURE CHIMNEYS AND BREACHINGS

CORROSION RESISTANCE

1. If the chimney is designed to handle saturated flue gases or flue gases with condensed acids, is the chimney designed to be corrosion resistant under all operating conditions?

   NFPA 82: 5.3.6

CHIMNEY TERMINATION

CLEARANCE

1. If the temperature of the secondary combustion chamber does not exceed 982 degrees C (1800 degrees F), does the chimney extend 3 m (10 ft) above any portion of any building within 7.6 m (25 ft)?

2. If the temperature of the secondary combustion chamber exceeds 982 degrees C (1800 degrees F), does the chimney extend 6.1 m (20 ft) above any portion of any building within 15 m (50 ft)?

3. Is the terminus of the chimney equipped with an approved spark arrester or protected in accordance with NFPA 82 section 4.1.4.1

   NFPA 82: 4.3.7

CHIMNEY CONNECTOR OR BREACHING

CONSTRUCTION

1. If the diameter of the chimney connector or breaching is less than 305 mm (12 in.), is the chimney constructed of at least 16 U.S. gauge steel?

2. If the diameter of the chimney connector or breaching is greater than 305 mm (12 in.), is the chimney constructed of at least 12 U.S. gauge steel?

3. Are expansion joints provided as required?

   NFPA 82: 4.3.8.1 and 4.3.8.9

LINING

1. If the chimney is 457 mm (18 in.) in diameter or less, are the walls lined with 63.5 mm (2½ in.) high-duty spall-resistant refractory brick (as defined by ASTM C 27)?

2. If the chimney is greater than 457 mm (18 in.) in diameter, are the walls lined with 114 mm (4½ in.) high-duty spall-resistant refractory brick (as defined by ASTM C 27)?

   NFPA 82: 4.3.8.26-3
CASTABLE PLASTIC LININGS

1. If castable plastic refractories are used in lieu of fire brick, are they of equivalent heat and corrosion resistance?
2. If castable plastic refractories are used in lieu of fire brick, are they supported by metal anchors made of corrosion-resistant steel capable of supporting the refractory load at 727 degrees C (1500 degrees F)?
3. Is the insulating value such that temperatures of the supports do not exceed 727 degrees C (1500 degrees F) under all firing conditions?

NFPA 82: 4.3.8.4

INTERNAL AREA

1. Is the net internal free area of the connector greater than the free area of the flue collar of the incinerator?
2. Is the chimney connector open and unobstructed and not enclosed?
3. Is the chimney connector readily accessible for inspection and replacement throughout its entire length?

NFPA 82: 4.3.8.5/6

GAS WASHER OR SCRUBBER

1. If a gas washer or scrubber and a draft inducer is required to provide adequate natural draft for operation, then:
   a. Is the chimney sized for natural draft operation and is a bypass installed around the gas washer?
   b. Is a suitable, normally-open damper installed in the bypass to allow venting of combustion products in the event of a power failure?

NFPA 82: 4.3.8.8

OUTDOOR INCINERATORS

DESIGN REQUIREMENTS

1. Does the incinerator comply with all of NFPA 82, Chapter 4, depending on use?

NFPA 82: 4.4

MAINTENANCE

INSPECTION SCOPE AND FREQUENCY

1. Are entire systems inspected and maintained not less than annually, in accordance with the manufacturer’s instructions?

NFPA 82: 10.1.1

RECORDS

1. Is there a signed, written record of the inspection available for review?

NFPA 82: 10.1.2