TECHNICAL NOTES

Chimney Top Devices in International Codes

FINAL REPORT

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FOREWORD

Chimney top devices are used throughout the world and to provide clearer guidance, the NFPA 211 Technical Committee would like to develop a clearer vision of the international use of chimney top devices. A Fire Protection Research Foundation report entitled, Impact of Chimney-top Appurtenances on Flue Gas Flow, was previously completed in December 2014 included a look at existing chimney-top devices and their effect on the flow of gas. It also included a review of available chimney-top devices. However, it did not consider international implications. This project reviewed international codes and standards as they pertain to the use of chimney top devices.

The purpose of the project, which is documented in this report, was to provide a review of the current requirements and the prescribed application of chimney top devices throughout international codes and standards for solid-fuel, oil-burning and gas-burning chimney/vent systems which includes fireplaces and heat producing appliances.

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About the Fire Protection Research Foundation

The Fire Protection Research Foundation plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.

About the National Fire Protection Association (NFPA)

Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission.

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Executive Summary

Proper design of chimney top devices is essential to ensure the safety of residential and commercial buildings against fire. Those chimney top devices include exhaust terminations, rain caps, decorative shrouds, chimney–top dampers and spark arrestors. However, information and provisions for such design is sporadic among existing International Codes. NFPA 211 is a major source of such information that is currently used for such design. Nevertheless, there exist gaps between the available information in International Codes and NFPA 211. This study is a comprehensive review of the current requirements and prescribed applications of chimney top devices throughout numerous international codes. The reviewed codes include International Building Code, International Residential Code, International Mechanical Code, International Fuel Gas Code, International Existing Building Code, and International Plumbing Code. The study pertains to solid-fuel, oil-burning and gas-burning chimney/vent systems including fireplaces and heat producing appliances. Through this study, the existing gaps between international codes and NFPA 211, as related to top devices and venting system, are identified and summarized.

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SECTION A: INTRODUCTION AND BACKGROUND

Chimneys are the primary means of safely venting combustion gases outside of an indoor environment. Therefore, it is important to fully understand all chimney components and their proper design and safety considerations. One of the most important factors in safe operation of chimneys is proper induced draft in the system, which is a function of combustion temperature, outdoor environment conditions, and flow resistance of the chimney assembly. A chimney top device is a component of a chimney providing the boundary between the flue gases inside the chimney and the outdoor environment. Improper design of the chimney top devices can cause blow back down the chimney, inhibit proper draft, or even allow noxious flue gases to re-enter the indoor environment. Chimney top devices include exhaust terminations, rain caps, decorative shrouds, chimney–top dampers and spark arrestors. However, existing codes and standards on these devices can vary widely and may lead to confusion and poor designs. NFPA 211 is a source of information on chimney top devices. Nevertheless, there exist gaps between the available information in NFPA 211 and existing codes. Previous research in December 2014, entitled, Impact of Chimney-Top Appurtenances on Flue Gas Flow, reviewed studies and reports of research related the existing chimney top devices and their effect on flue gas flow.

The main objective of this study is to have a comprehensive review of the current requirements and prescribed applications of chimney top devices in international codes. Codes reviewed include the International Building Code, International Residential Code, International Mechanical Code, International Fuel Gas Code, International Existing Building Code, and International Plumbing Code. The study pertains to solid-fuel, oil-burning and gas-burning chimney/vent systems including fireplaces and heat-producing appliances. In this study, the existing gaps between international codes and NFPA 211, as relate to top devices and venting systems, are identified and summarized.

SECTION B: GAP IDENTIFICATION

Table 1: Summary of gap identification comparing the International Building Code to NFPA 211

Device	Current NFPA 211	Code Information(IBC)
Architectural Features	7.1.8.5	Determination of net pressure coefficients, C_{net}. (Sec. 1609.6.4.3)
Cap	4.6.1, 3.3.18.1 Chimney Cap	Chimney caps (Sec.2113.9.1)
Cap	4.6.2	Rain caps (Sec.2113.9.3)
Termination	Table 7.2, FIGURES 4.2(a)	Termination (Sec.2113.9)
Spark arrestors	4.6.4 Spark Arresters., 4.6.4.1	Spark arrestors (Sec.2113.9.2)
Flue and Vent System	7.1.11.3.1,7.1.11.3.2, 7.1.11.3.3, 7.1.11.3.4	Minimum area (Sec.2113.16.1)
Flue and Vent System	No Information	Determination of minimum area (Sec. 2113.16.2)
Clearance	4.3.2 Clearance, 7.3.1.1, 7.3.1.2, 7.3.1.5	Framing around flues and chimneys (Sec. 2304.5)
Flue and Vent System	10.5 Notice of Usage. 10.5.1	Notice of usage (Sec. 2113.11.1.5)
Flue and Vent System	7.2.4 Residential-Type and Building Heating Appliances., 7.2.3	Residential-type appliances (general). (Sec. 2113.11.1)
Flue and Vent System	15.4.2.5.2, 15.4.2.5.3	Flue area (appliance) (Sec. 2113.15)
Flue and Vent System	8.3.1.2	Lining (Sec. 2113.11.2.3)
Termination	8.3.2 Termination (Height), Table 7.2	Termination height (Sec. 2113.11.2.5)
Clearance	4.3.2 Clearance, Table 7.2, 7.3.1.1, 7.3.1.2	Clearance (Sec. 2113.11.2.6)
Termination	8.4.2 Termination (Height), Table 7.2	Termination height (Sec. 2113.11.3.4)
Clearance	7.3.1.5	Clearance (Sec. 2113.11.3.5)

Table 2: Summary of gap identification comparing the International Mechanical Code to NFPA 211

Device	Current NFPA 211	Code Information (IMC)
Clearance	Table 13.6.2.1,13.5.1.4	Masonry chimneys (Sec. 308.4.2.2)
Draft Device	7.1.12 Positive-Pressure Applications.	Positive pressure (Sec. 801.9)
Flue and Vent System	7.1.12 Positive-Pressure Applications	Positive flow (Sec. 801.4)
Flue and Vent System	4.5.3 Space Surrounding Liner or Vent.	Space around lining (Sec. 801.17)
Flue and Vent System	15.3.2.4, 14.9 Damaged or Deteriorated Liners.	Flue passageways (Sec. 801.18.2)
Clearance	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Clearances. (Sec.801.18.4)
Cap	10.6.1	Vent termination caps required (Sec. 802.4)
Termination	FIGURE 4.2(a)(b)	Type L vent terminations (Sec. 802.5)
Flue and Vent System	4.2.2, 10.7.1.1, 10.7.4, 3.3.142.2 Pellet Vent	Minimum vent heights (Sec. 802.6)
Flue and Vent System	7.2.2.1, 7.2.2.2	Flue lining (Sec. 801.16)
Flue and Vent System	13.4.4 Flue Cross-Sectional Area.	Solid fuel appliance flues (Sec. 801.7)
Damper	9.9 Dampers. 9.9.1	Manual dampers (Sec. 803.5)
Draft Device	4.1.2.5 (b)	Mechanical draft systems for manually fired appliances and fireplaces (Sec.804.3.8)
Damper	9.9.4	Automatic dampers (Sec. 803.6)
Draft Device	1.4 Forced/Induced Draft Systems.	Forced draft systems (Sec. 804.3.1)
Termination	8.2.1.2	Termination (Sec. 804.3.3)
Terminations	10.4.5, FIGURE 4.2(a)	Mechanical draft systems (Sec. 804.3), Horizontal terminations. (Sec. 804.3.4)
Terminations	8.2.1.2, 10.4.5, 3.3.18.2 Vent Cap,	Mechanical draft systems (Sec. 804.3), Vertical terminations. (Sec. 804.3.5)
Termination	10.7.1 Direct Vent Appliances Fired with Gas, Oil, or Pellet Fuels.	Direct-vent terminations (Sec. 804.1)
Terminations	10.7.1.2	Terminal clearances (Sec. 804.2.1)
Decorative Shroud	6.1.5 Decorative Shrouds	Decorative shrouds (Sec. 805.6)

Table 2: Summary of gap identification comparing the International Mechanical Code to NFPA 211 (Continued)

Device	Current NFPA 211	Code Information (IMC)
Terminations	Table7.2, 7.3.1.5, 8.3.3.1.1, Table 9.5.1.1	Exhaust outlets (Sec. 511.2), TABLE 511.2
Flue and Vent System	14.8 Operating Malfunction.	Size (Sec. 801.18.1)
General Information	6.1.3.2, 3.3.28.1.2 Factory-Built, Residential-Type and Building Heating Appliance–Type Chimney.	Solid fuel appliances (Sec. 805.2)
General Information	15.4.2.5.3	Oil-fired appliances (Sec. 801.2.1)
Flue and Vent System	7.2.4 Residential-Type and Building Heating Appliances., 7.2.3 Low-, Medium-, and High-Heat Appliances	Residential and low-heat appliances (general) (Sec. 801.16.1)
General Information	6.1.3.1	Medium-heat appliances (Sec. 805.5)

Table 3: Summary of gap identification comparing the International Fuel Gas Code to NFPA 211

Device	Current NFPA 211	Code Information(IFGC)
Flue and vent system	5.3 Space Surrounding Liner or Vent., 10.7.1.1	Combustion air ducts. (Sec. 304.11)
Flue and vent system	14.8 Operating Malfunction.	Size. (Sec. 501.15.1)
Clearance	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Clearances. (Sec. 501.15.4)
Draft device	4.1.2.5, 4.1.2 Mechanical Draft Systems, 10.4.5, 4.1.4 Forced/Induced Draft Systems., 4.1.5 Natural Draft Vent Connectors, 10.4.5 (c)	Mechanical draft systems (Sec. 503.3.3)
Draft device	10.4.5 (3)	Positive pressure (Sec. 501.6)
Terminations	8.2.1, Termination (Height), 8.2.1.1, 4.2.2, 11.1.4, 6.1.5 Decorative Shrouds.	Chimney termination (Sec. 503.5.4)
Draft device	3.3.131.1 Engineered Venting or Chimney System	Mechanical draft (Sec. 503.6.9.4)
Decorative shrouds	10.4.6	Decorative shrouds (Sec. 503.6.4.1)
Flue and vent system	10.4.2, 10.4.3	Minimum height (Sec. 503.6.5)
Terminations	FIGURE 4.2(a)	Forced air inlets (Sec. 503.6.7)
Terminations	10.4.2, FIGURE 4.2(a)	Termination (Sec. 503.7.3)
Terminations	3.3.116 Roof Jack., 10.6.4.2	Roof terminations (Sec. 503.6.6)
Flue and vent system	8.1.8 Sizing., 9.4.2	Size of single-wall metal pipe (Sec. 503.7.9)
Terminations	A.3.3.131.1(1)	Termination capacity (Sec. 503.7.11)
Draft Device	9.11.1	Additional devices (Sec. 503.12.4)
Damper	9.9.1, 9.9.2, 9.9.3	Manually operated dampers (Sec. 503.13)
Damper	9.9.4	Automatically operated vent dampers (Sec. 503.14)
Damper	9.7.9	Obstructions (Sec. 503.15)
Flue and vent system	9.4.3	Vertical vent maximum size (Sec. 504.3.17)

Table 3: Summary of gap identification comparing the International Fuel Gas Code to NFPA 211(Continued)

Device	Current NFPA 211	Code Information(IFGC)
Flue and vent system	4.5.3 Space Surrounding Liner or Vent., 6.1.3.4, 10.7.1.1	Space surrounding lining or vent (Sec. 503.5.10)
Flue and vent system	A.10.1.4	General (Sec. 502.1)
Flue and vent system	9.11.1, 10.5.1,	Gas vents installed within masonry chimneys (Sec. 503.6.3)
Terminations	10.4.1.3, FIGURE 4.2(a)	Gas vent terminations (Sec. 503.6.4)
General Info	7.2.4 Residential-Type and Building Heating Appliances, 7.2.3 Low-, Medium-, and High-Heat Appliances.	Residential and low-heat appliances flue lining systems (Sec. 501.12)
Clearance	Table 13.6.2.1	Reduction table (Sec. 308.2), TABLE 308.2
Opening	9.8.3, 9.8.4	Liquid fuel-burning appliances (Sec. 503.5.7.2)
General Info	7.4.3.3	Incinerators (Sec. 503.2.5)
Flue and vent system	10.1.4	Special gas vent (Sec. 503.4.2)
General Info	6.1.1 General. 3.3.28.4 Factory-Built, Positive Pressure Capable Chimney.	Factory-built chimneys (Sec. 503.5.1)
General Info	7.2.8 Listed or Approved Materials., 7.2.9.2 7.2.9.1	Masonry chimneys (Sec. 503.5.3)
Flue and vent system	A.3.3.131.1 Engineered Venting or Chimney System.	Engineering calculations (Sec. 504.2.16)
Flue and vent system	No Information	Height entries (Sec. 504.2.17)
Flue and vent system	No Information	Vent height measurement (Sec. 504.3.12)
Flue and vent system	No Information	Minimum size (Sec. 504.2.2)
Flue and vent system	No Information	Chimney and vent locations (Sec. 504.2.9)
Flue and vent system	No Information	Chimney and vent location (Sec. 504.3.20)
Damper	No Information	Free opening area of chimney dampers (Sec. 634.1)

Table 4: Summary of gap identification comparing the International Residential Code to NFPA 211

Device	Current NFPA 211	Code Information(IRC)
Flashing	10.4.4, FIGURE A.11.2(a) FIGURE A.11.2(b)	Other flashing (Sec. R905.2.8.4)
Crickets	No Information	Crickets and saddles (Sec. R903.2.2)
	7.2.14 Multiple Flues, 7.2.14.1, 7.2.14.2	Multiple flues (Sec. R1003.13)
Damper	11.2.9 Dampers. 11.2.9.1, 11.2.9.2	Damper (Sec. R1001.7.1)
Flue and vent system	7.1.11.3.1, 7.1.11.3.2, 7.1.11.3.3, 7.1.11.3.4, 7.1.11.3.5	Flue area (masonry fireplace) (Sec. R1003.15), R1003.15.1 Option 1. (Sec. R1003.15.2) Option 2.
Flue and vent system	7.1.3 Change in Size or Shape of Flue at Combustible Members	Changes in dimension (Sec. R1003.6)
Termination	8.2.1.1	Termination (Sec. R1003.9)
Cap	3.3.18.1 Chimney Cap, 4.6.1	Chimney caps (Sec. R1003.9.1)
Flue and vent system	7.2.2.1, 7.2.2.2	Flue lining (material) (Sec. R1003.11)
Flue and vent system	7.2.4 Residential-Type and Building Heating Appliances. 7.2.3. Low-, Medium-, and High-Heat Appliances.	Residential-type appliances (general) (Sec. R1003.11.1)
Flue and vent system	4.5.3 Space Surrounding Liner or Vent.	Space around lining (Sec. R1003.12.2)
Decorative shroud	11.1.4, 6.1.5 Decorative Shrouds.	Decorative shrouds (Sec. R1004.3)
General Information	6.1.1 General.	Listing (Sec. R1005.1)
Decorative shroud	6.1.5 Decorative Shrouds, 11.1.4	Decorative shrouds (Sec. R1005.2)
Draft Device	4.1.1.2, 3.3.73.2 Chimney Flue.	Draft requirements (Sec. M1801.2)
Flue and vent system	A.9.11, 4.1.1.1	Size (Sec. M1801.3.1)
Clearance	4.3.2 Clearance, 7.3.1.1, 7.3.1.2, 7.3.1.5	Clearances (Sec. M1801.3.4)
Draft Device	4.1.2.1, 4.1.4 Forced/Induced Draft Systems	Mechanical draft systems. (Sec. M1801.5)
Opening	A.15.4.	Unused openings (Sec. M1801.10)
Damper	9.9.1, 9.9.3	Manually operated (Sec. M1802.2.1)
Damper	9.9.4	Automatically operated (Sec. M1802.2.2)

Table 4: Summary of gap identification comparing the International Residential Code to NFPA 211 (Continued)

Device	Current NFPA 211	Code Information(IRC)
Draft Device	9.11.2, A.9.11	Draft regulators (Sec. M1802.3)
Flue and vent system	10.4.4	Through the roof (Sec. M1804.2.1)
Decorative shroud	6.1.5 Decorative Shrouds., 11.1.4	Decorative shrouds (Sec. M1804.2.2)
Draft Device	4.2.2, 10.4.2, 10.4.3	Natural draft appliances (Sec. M1804.2.3)
Flue and vent system	10.6.1, FIGURE 4.2(a), FIGURE 4.2(b)	Type L vent (Sec. M1804.2.4)
Termination	10.7.1.1	Direct vent terminations (Sec. M1804.2.5)
Draft Device	4.1.2.5, 10.4.5, 10.7.1.3	Mechanical draft systems (Sec. M1804.2.6)
Opening	9.4.2,	Size of single-appliance venting systems (Sec. M1804.3.1)
Flue and vent system	15.4.2.5.3	Size of chimney flues (Sec. M1805.3)
Clearance	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Clearances (Sec. G2425.15.4 (501.15.4))
Termination	8.2.1 Termination (Height), 8.2.1.1, 4.2.2, 11.1.4, 6.1.5 Decorative Shrouds.	Chimney termination (Sec. G2427.5.3 (503.5.4))
Draft Device	3.3.131.1 Engineered Venting or Chimney System	Mechanical draft (Sec. G2427.6.8.4 (503.6.9.4)
Opening	9.8.4	Two or more openings (Sec. G2427.10.4.1 (503.10.4.1))
General Information	A.3.3.28.1.3 Type HT Factory-Built, Residential-Type and/or Building Heating Appliance–Type Chimney.	Listing (Sec. G2430.1 (506.1))
General Information	6.1.3.2, 6.1.3.5	Solid-fuel appliances (Sec. R1005.3)

Table 4: Summary of gap identification comparing the International Residential Code to NFPA 211 (Continued)

Device	Current NFPA 211	Code Information(IRC)
General Information	6.1.3.1	Medium-heat appliances (Sec. R1005.6)
Cap	4.6.2	Rain caps (Sec. R1003.9.3)
Cricket	No Information	Chimney crickets (Sec. R1003.20)
Draft Device	9.11.1	Additional devices (Sec. G2427.12.4 (503.12.4))
Damper	9.7.9, 9.11.1	Obstructions (Sec. G2427.15 (503.15))
Damper	No Information	Free opening area of chimney dampers (Sec. G2453.1 (634.1))
Spark arrestor	4.6.4 Spark Arresters. ,4.6.4.1	Spark arrestors (Sec. R1003.9.2)
Flue and vent system	13.4.4 Flue Cross-Sectional Area.	Size of chimney flue for solid-fuel appliance (Sec. M1805.3.1)
Flue and vent system	9.8.3, 9.8.4	Liquid fuel-burning appliances (Sec. G2427.5.6.2 (503.5.7.2))

Table 5: Summary of gap identification comparing the International Existing Building Code to NFPA 211

Device	Current NFPA 211	Code Information(IEBC)
Draft Device	4.1.2.5	Mechanical draft systems for manually fired appliances and fireplaces (Sec. 608.2)

No information related to chimney top-devices was identified in international Plumbing Code.

SECTION C: SUMMARY AND CONCLUSIONS

The gaps between specified international codes and NFPA211 are categorized as follows:

Gap Category

Complete Gap: The section in the specified code was nowhere identified within NFPA211

Partial Gap: The section in the specified code was partially addressed within NFPA211

No Gap: There section in the specified code was completely addressed within NFPA211

The following tables depict the existence and level of gap between International Codes and NFPA 211 for each chimney top device item*.

Table 6: Caps

Code	Code Information	Current NFPA211	Gap
IBC	Chimney caps (Sec.2113.9.1)	3.3.18.1 Chimney Cap, 4.6.1	Partial Gap
	Rain caps (Sec.2113.9.3)	4.6.2	Partial Gap
IMC	Vent termination caps required (Sec. 802.4)	10.6.1	No Gap
IRC	Chimney caps (Sec. R1003.9.1)	3.3.18.1 Chimney Cap, 4.6.1	Partial Gap
	Rain caps (Sec. R1003.9.3)	4.6.2	Partial Gap
	Unused openings (Sec. M1801.10)	A.15.4.	No Gap
Result	**There is a Partial Gap between International Code and NFPA 211**		

Table 7: Spark Arrestors

Code	Code Information	Current NFPA211	Gap
IBC	Spark arrestors (Sec.2113.9.2)	4.6.4 Spark Arresters, Sec 4.6.4.1	Discrepancies Noted
IRC	Spark arrestors (Sec. R1003.9.2)	4.6.4 Spark Arresters ,4.6.4.1	Discrepancies Noted
Result	**There exists Discrepancies between International Code and NFPA 211**		

* Item refers to (1) Devices; and (2) any feature, physical or geometrical properties that are related to top chimney devices.

Table 8: Dampers

Code	Code Information	Current NFPA211	Gap
IMC	Manual dampers (Sec. 803.5)	9.9 Dampers. 9.9.1	No Gap
	Automatic dampers (Sec. 803.6)	9.9.4	Partial Gap
IFGC	Manually operated dampers (Sec. 503.13)	9.9.1, 9.9.2, 9.9.3	No Gap
	Automatically operated vent dampers (Sec. 503.14)	9.9.4	No Gap
	Obstructions (Sec. 503.15)	9.7.9	No Gap
	Free opening area of chimney dampers (Sec. 634.1)	No Information	Complete Gap
IRC	Damper (Sec. R1001.7.1)	11.2.9 Dampers. 11.2.9.1, 11.2.9.2	No Gap
	Manually operated (Sec. M1802.2.1)	9.9.1, 9.9.3	No Gap
	Automatically operated (Sec. M1802.2.2)	9.9.4	Partial Gap
	Free opening area of chimney dampers (Sec. G2453.1 (634.1))	No Information	Complete Gap
Result	**There is partial gap between International Code and NFPA 211**		

Table 9: Draft Devices

Code	Code Information	Current NFPA211	Gap
IMC	Positive pressure (Sec. 801.9)	7.1.12 Positive-Pressure Applications	No Gap
	Forced draft systems (Sec. 804.3.1)	4.1.4 Forced/Induced Draft Systems	No Gap
	Mechanical draft systems for manually fired appliances and fireplaces (Sec.804.3.8)	4.1.2.5 (b)	No Gap
IFGC	Mechanical draft systems (Sec. 503.3.3)	4.1.2.5, 4.1.2 Mechanical Draft Systems, 10.4.5, 4.1.4Forced/Induced Draft Systems., 4.1.5 Natural Draft Vent Connectors, 10.4.5 (c)	Partial Gap
	Mechanical draft (Sec. 503.6.9.4)	3.3.131.1 Engineered Venting or Chimney System	No Gap
	Positive pressure (Sec. 501.6)	10.4.5 (3)	No Gap
	Additional devices (Sec. 503.12.4)	9.11.1	Partial Gap
IRC	Draft requirements (Sec. M1801.2)	4.1.1.2, 3.3.73.2 Chimney Flue	No Gap
	Mechanical draft systems (Sec. M1801.5)	4.1.2.1, 4.1.4 Forced/Induced Draft Systems	No Gap
	Draft regulators (Sec. M1802.3)	9.11.2, A.9.11	Partial Gap
	Natural draft appliances (Sec. [illegible])	4.2.2, 10.4.2, 10.4.3	No Gap
	Mechanical draft systems (Sec. M1804.2.6)	4.1.2.5, 10.4.5, 10.7.1.3	Partial Gap
	Mechanical draft (Sec. G2427.6.8.4 (503.6.9.4))	3.3.131.1 Engineered Venting or Chimney System	No Gap
	Additional devices (Sec. G2427.12.4 (503.12.4))	9.11.1	Partial Gap
	Obstructions (Sec. G2427.15 (503.15))	9.7.9, 9.11.1	Partial Gap
IEBC	Mechanical draft systems for manually fired appliances and fireplaces (Sec. 608.2)	4.1.2.5	No Gap
Result	**There is partial gap between International Code and NFPA 211**		

Table 10: Decorative Shrouds

Code	Code Information	Current NFPA211	Gap
IMC	Decorative shrouds (Sec. 805.6)	6.1.5 Decorative Shrouds	No Gap
IFGC	Decorative shrouds (Sec. 503.6.4.1)	10.4.6, 6.1.1 General, 6.1.1 General	No Gap
IRC	Decorative shrouds (Sec. R1004.3)	11.1.4, 6.1.5 Decorative Shrouds, 6.1.1 General	No Gap
	Decorative shrouds (Sec. R1005.2)	11.1.4, 6.1.5 Decorative Shrouds, 6.1.1 General	No Gap
	Decorative shrouds (Sec. M1804.2.2)	11.1.4, 6.1.5 Decorative Shrouds, 6.1.1 General	No Gap
Result	**There is No gap between International Code and NFPA 211**		

Table 11: Openings

Code	Code Information	Current NFPA211	Gap
IMC	Terminal clearances (Sec. 804.2.1)	10.7.1.2	Partial Gap
IFGC	Liquid fuel-burning appliances (Sec. 503.5.7.2)	9.8.3, 9.8.4	No Gap
	Two or more openings (Sec. G2427.10.4.1 (503.10.4.1))	9.8.4	Partial Gap
Result	**There is partial gap between International Code and NFPA 211**		

Table 12: Exhaust Terminations

Code	Code Information	Current NFPA211	Gap
IBC	Termination (Sec.2113.9)	Table 7.2, FIGURE 4.2(a), FIGURE 4.2(b)	No Gap
	Termination height (Sec. 2113.11.2.5)	8.3.2 Termination (Height), Table 7.2	No Gap
	Termination height (Sec. 2113.11.3.4)	8.4.2 Termination (Height), Table 7.2	No Gap
IMC	Type L vent terminations (Sec. 802.5)	FIGURE 4.2(a), (b)	No Gap
	Termination (Sec. 804.3.3)	8.2.1.2	Partial gap
	Mechanical draft systems (Sec. 804.3) Horizontal terminations (Sec. 804.3.4)	10.4.5, FIGURE 4.2(a)	Partial Gap
	Mechanical draft systems (Sec. 804.3) Vertical terminations (Sec. 804.3.5)	8.2.1.2, 10.4.5, 3.3.18.2 Vent Cap,	Partial Gap
	Direct-vent terminations (Sec. 804.1)	10.7.1 Direct Vent Appliances Fired with Gas, Oil, or Pellet Fuels	No Gap
	Exhaust outlets. (Sec. 511.2), TABLE 511.2	Table 7.2, 7.3.1.5, 8.3.3.1.1, Table 9.5.1.1	Partial Gap
	Chimney termination (Sec. 503.5.4)	8.2.1 Termination (Height), 8.2.1.1, 4.2.2, 11.1.4, 6.1.5 Decorative Shrouds	No Gap
	Forced air inlets (Sec. 503.6.7)	FIGURE 4.2(a)	No Gap
	Termination (Sec. 503.7.3)	10.4.2, FIGURE 4.2(a)	Partial Gap
	Roof terminations (Sec. 503.6.6)	3.3.116 Roof Jack., 10.6.4.2	No Gap
	Termination capacity (Sec. 503.7.11)	A.3.3.131.1(1)	No Gap
	Gas vent terminations (Sec. 503.6.4)	10.4.1.3, FIGURE 4.2(a)	Partial Gap
	Minimum height (Sec. 503.6.5)	10.4.3, 10.4.2	No Gap
IRC	Termination (Sec. R1003.9)	8.2.1.1	Partial Gap
	Direct vent terminations (Sec. M1804.2.5)	10.7.1.1	No Gap
	Chimney termination (Sec. G2427.5.3 (503.5.4))	8.2.1 Termination (Height), 8.2.1.1, 4.2.2, 11.1.4, 6.1.5 Decorative Shrouds.	Partial Gap
Result	**There is partial gap between International Code and NFPA 211**		

Table 13: Flue and Vent Systems

Code	Code Information	Current NFPA211	Gap
IBC	Residential-type appliances (general) (Sec. 2113.11.1)	7.2.4 Residential-Type and Building Heating Appliances., 7.2.3	Partial Gap
	Minimum area (Sec.2113.16.1)	7.1.11.3.1,7.1.11.3.2, 7.1.11.3.3, 7.1.11.3.4	No Gap
	Determination of minimum area (Sec. 2113.16.2)	No information	Complete Gap
	Notice of usage (Sec. 2113.11.1.5)	10.5 Notice of Usage, 10.5.1	Partial Gap
	Flue area (appliance) (Sec. 2113.15)	15.4.2.5.3, 15.4.2.5.3	Partial Gap
	Lining (Sec. 2113.11.2.3)	8.3.1.2	Partial Gap
IMC	Residential and low-heat appliances (general) (Sec. 801.16.1)	7.2.4 Residential-Type and Building Heating Appliances., 7.2.3 Low-, Medium-, and High-Heat Appliances	No Gap
	Minimum vent heights (Sec. 802.6)	4.2.2, 10.7.1.1, 10.7.4, 3.3.142.2 Pellet Vent.	No Gap
	Positive flow (Sec. 801.4)	7.1.12 Positive-Pressure Applications	Partial Gap
	Space around lining (Sec. 801.17)	4.5.3 Space Surrounding Liner or Vent.	No Gap
	Flue passageways (Sec. 801.18.2)	15.3.2.4, 14.9 Damaged or Deteriorated Liners	No Gap
	Flue lining (Sec. 801.16)	7.2.2.1, 7.2.2.2	No Gap
	Solid fuel appliance flues (Sec. 801.7)	13.4.4 Flue Cross-Sectional Area	No Gap
	Size (Sec. 801.18.1)	14.8 Operating Malfunction	No Gap
IFGC	Combustion air ducts (Sec. 304.11)	5.3 Space Surrounding Liner or Vent., 10.7.1.1	No Gap
	Size (Sec. 501.15.1)	14.8 Operating Malfunction	No Gap
	Size of single-wall metal pipe (Sec. 503.7.9)	8.1.8 Sizing, 9.4.2	Partial Gap
	Vertical vent maximum size (Sec. 504.3.17)	9.4.3	Partial Gap
	Space surrounding lining or vent (Sec. 503.5.10)	4.5.3 Space Surrounding Liner or Vent, 6.1.3.4, 10.7.1.1	Partial Gap

Table 13: FLUE AND VENT SYSTEMS (Continued)

Code	Code Information	Current NFPA211	Gap
IFGC	General (Sec. 502.1)	A.10.1.4	Partial Gap
	Gas vents installed within masonry chimneys (Sec. 503.6.3)	9.11.1, 10.5.1	No Gap
	Residential and low-heat appliances flue lining systems (Sec. 501.12)	7.2.4 Residential-Type and Building Heating Appliances. 7.2.3 Low-, Medium-, and High-Heat Appliances.	No Gap
	Height entries (Sec. 504.2.17)	No Information	Complete Gap
	Vent height measurement (Sec. 504.3.12)	No Information	Complete Gap
	Minimum size (Sec. 504.2.2)	No Information	Complete Gap
	Chimney and vent locations (Sec. 504.2.9)	No Information	Complete Gap
	Chimney and vent location (Sec. 504.3.20)	No Information	Complete Gap
	Special gas vent (Sec. 503.4.2)	10.1.4	No Gap
IRC	Multiple flues (Sec. R1003.13)	7.2.14 Multiple Flues, 7.2.14.1, 7.2.14.2	Partial Gap
	Flue area (masonry fireplace) (Sec. R1003.15), R1003.15.1 Option 1. R1003.15.2 Option 2.	7.1.11.3.1, 7.1.11.3.2, 7.1.11.3.3, 7.1.11.3.4, 7.1.11.3.5	Partial Gap
	Changes in dimension (Sec. R1003.6)	7.1.3 Change in Size or Shape of Flue at Combustible Members	No Gap
	Flue lining (material) (Sec. R1003.11)	7.2.2.1, 7.2.2.2	No Gap
	Residential-type appliances (general). (Sec. R1003.11.1)	7.2.4 Residential-Type and Building Heating Appliances, 7.2.3 Low-, Medium-, and High-Heat	Partial Gap
	Space around lining (Sec. R1003.12.2)	4.5.3 Space Surrounding Liner or Vent.	Partial Gap
	Size (Sec. M1801.3.1)	A.9.11, 4.1.1.1	No Gap
	Through the roof (Sec. M1804.2.1)	10.4.4	Partial Gap

Table 13: FLUE AND VENT SYSTEMS (Continued)

Code	Code Information	Current NFPA211	Gap
IRC	Type L vent (Sec. M1804.2.4)	10.6.1, FIGURE 4.2(a) FIGURE 4.2(b)	No Gap
	Size of chimney flues (Sec. M1805.3)	15.4.2.5.3	Partial Gap
	Size of chimney flue for solid-fuel appliance (Sec. M1805.3.1)	3.4.4 Flue Cross-Sectional Area.	No Gap
	Liquid fuel-burning appliances (Sec. G2427.5.6.2 (503.5.7.2))	9.8.3, 9.8.4	No Gap
Result	**There is partial gap between International Code and NFPA 211**		

Table 14: General Information

Code	Code Information	Current NFPA211	Gap
IMC	Solid fuel appliances (Sec. 805.2)	6.1.3.2, 3.3.28.1.2 Factory-Built, Residential-Type and Building Heating Appliance–Type Chimney.	No Gap
	Medium-heat appliances (Sec. 805.5)	6.1.3.1	No Gap
	Oil-fired appliances (Sec. 801.2.1)	15.4.2.5.3	No Gap
IFGC	Incinerators (Sec. 503.2.5)	7.4.3.3	No Gap
	Factory-built chimneys (Sec. 503.5.1)	6.1.1 General. 3.3.28.4 Factory-Built, Positive Pressure Capable Chimney.	No Gap
	Masonry chimneys (Sec. 503.5.3)	7.2.8 Listed or Approved Materials, 7.2.9.2, 7.2.9.1	Partial Gap
IRC	Listing (Sec. G2430.1 (506.1))	A.3.3.28.1.3 Type HT Factory-Built, Residential-Type and/or Building Heating Appliance–Type Chimney.	No Gap
	Solid-fuel appliances (Sec. R1005.3)	6.1.3.2, 6.1.3.5	Partial Gap
	Medium-heat appliances (Sec. R1005.6)	6.1.3.1	No Gap
	Listing (Sec. R1005.1)	6.1.1 General.	No Gap
Result	**There is Partial gap between International Code and NFPA 211**		

Table 15: Architectural features

Code	Code Information	Current NFPA211	Gap
IBC	Determination of net pressure coefficients, C_{net}.(Sec. 1609.6.4.3)	7.1.8.5	Partial Gap
IRC	Chimney crickets (Sec. R1003.20)	No Information	Complete Gap
	Other flashing (Sec. R905.2.8.4)	10.4.4, FIGURE A.11.2(a) FIGURE A.11.2(b)	Partial Gap
	Crickets and saddles (Sec. R903.2.2)	No Information	Complete Gap
Result	**There is partial gap between International Codes and NFPA 211**		

Table 16: Clearance

Code	Code Information	Current NFPA211	Gap
IBC	Clearance (Sec. 2113.11.2.6)	4.3.2 Clearance, Table 7.2, 7.3.1.1, 7.3.1.2	No Gap
	Clearance (Sec. 2113.11.3.5)	7.3.1.5	No Gap
	Framing around flues and chimneys (Sec. 2304.5)	4.3.2 Clearance, 7.3.1.1, 7.3.1.2, 7.3.1.5	Partial Gap
IMC	Masonry chimneys (Sec. 308.4.2.2)	Table 13.6.2.1, 13.5.1.4	Partial Gap
	Clearances (Sec.801.18.4)	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Partial Gap
	Clearances (Sec. 501.15.4)	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Partial Gap
IFGC	Reduction table (Sec. 308.2), TABLE 308.2	Table 13.6.2.1	Partial Gap
IRC	Clearances (Sec. M1801.3.4)	4.3.2 Clearance, 7.3.1.1, 7.3.1.2, 7.3.1.5	Partial Gap
	Clearances (Sec. G2425.15.4 (501.15.4))	4.3.2 Clearance., 7.3.1.1, 7.3.1.2, 7.3.1.5	Partial Gap
Result	**There is partial gap between International Codes and NFPA 211**		

References

[1] International Building Code, 2015

[2] International Mechanical Code, 2015

[3] International Fuel Gas Code, 2015

[4] International Residential Code, 2015

[5] International Existing Building Code, 2015

[6] International Plumbing Code, 2015

[7] NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel– Burning Appliances 2013