

# Residential Fire Sprinklers



A retrospective review of the NFPA 13R and NFPA13D; Residential Sprinkler System Installation Standards, with background information regarding the development, design uses and calculation options, installation and plans review will all be highlighted as we move forward to making homes safer for generations of families.

# 360 Session breakdown

- NFPA, Standard development, Public Input/Comments
- History of Residential sprinklers (Statistics and losses)
- Fundamental differences between 13, 13R, 13D
  - Design, Layouts
  - Calculation options
- Prescriptive Pipe Sizing Method (Introduced in 2010)

# 360 Wearing several hats



- Scott Pugsley SET, FPT, *Fire Protection Geek*
- Professor and Industry Coordinator: Seneca College
  - Alumni Fire Protection Engineering Technology '97
  - Principle Technical Committee Member NFPA 13R/D : C.A.S.A
  - Technical Committee Member : C.A.S.A - Ontario Region
  - Ontario Regional Manager : C.A.S.A

# 360 Information sources and credits

- National Fire Protection Association : [www.NFPA.org](http://www.NFPA.org)
- Home Fire Sprinkler Collision : [www.Homefiresprinkler.org](http://www.Homefiresprinkler.org)
- Fire Sprinkler Initiative (Within NFPA ) : [www.Firesprinklerinitiative.org](http://www.Firesprinklerinitiative.org)
- Canadian Automatic Fire Sprinkler Association : [www.Casa-firesprinkler.org](http://www.Casa-firesprinkler.org)
- National Fire Sprinkler Association : [www.NFSA.org](http://www.NFSA.org)
- Globe sprinkler : [www.Globesprinkler.com/](http://www.Globesprinkler.com/)
- Reliable Automatic Sprinkler : [www.Reliablesprinkler.com/](http://www.Reliablesprinkler.com/)
- Tyco Fire Products : [www.Tyco-fire.com/](http://www.Tyco-fire.com/)
- Victaulic : [www.Victaulic.com/](http://www.Victaulic.com/)
- Viking Corp : [www.Vikingcorp.com/](http://www.Vikingcorp.com/)



## Big small print

Goal of these sessions is to share with you some of my knowledge regarding Residential Fire Sprinklers from a contracting, designing, reviewing and enforcing standpoint; all of which represent my personal experiences and do not necessarily reflect the opinions of Seneca College, C.A.S.A or NFPA or my wife

# 360 Best source of information



VS



**360 National Fire Protection Association (NFPA)**

What do they do?	What they do not do!
Collect statistics and data	
Public Education	
Training to all interested groups	
Fire Protection Research Foundation	
Codes and Standards	

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**360 National Fire Protection Association (NFPA)**

**OTHER WAYS TO BE INVOLVED**

- Board of Directors \* (\* Appointment positions)
- Standards Council \*
- Technical Committee Membership
- Submit Public Input of Public Comments
- Research Technical Panels
- Attend Meetings as a guest (Next meetings for 13, 13R/D, June 24 - 25 Chicago)
- Join a task group (Special use/needs based: 46 groups with the sprinkler project)
- Follow the NFPA TC Activity through the Document information tab and alert

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**360 National Fire Protection Association (NFPA)**

**NINE (9) CLASSIFICATION OF COMMITTEE MEMBERS** ([HTTP://WWW.NFPA.ORG/TCCLASS](http://www.nfpa.org/TCCLASS))

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

**Manufacturer (M):** A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.

**User (U):** A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.

**Installer/Maintainer (I/M):** A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.

**Labor (L):** A labor representative or employee concerned with safety in the workplace.

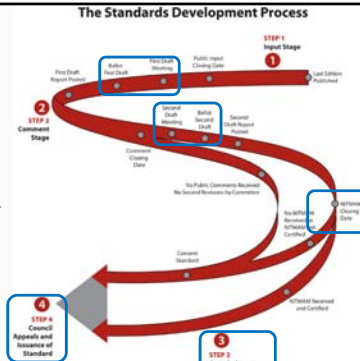
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**360 13R 13C**

**The Standards Development Process**

Current NFPA 13 R/D status

- Public input closed 5/31/2013
- Public comment closed 5/16/2014
- NITMAM close date 3/6/2015 (Notice of Intent to Make a Motion)
- NFPA Technical Meeting 6/24/2015



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**360 National Fire Protection Association (NFPA)**

**Applied Research/Testing Laboratory:** A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.

**Enforcing Authority (E):** A representative of an agency or an organization that promulgates and/or enforces standards.

**Insurance (I):** A representative of an insurance company, broker, agent, bureau, or inspection agency.

**Consumer (C):** A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).

**Special Expert (SE):** A person not representing (1) through (8), and who has special expertise in the scope of the standard or portion thereof.

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**360 Main point of access...**

- NFPA Standard development, public comments and open access

[www.NFPA.org\13R](http://www.NFPA.org\13R) 

[www.NFPA.org\13D](http://www.NFPA.org\13D) 

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**National Fire Protection Association**  
The authority on fire, electrical, and building safety

**NFPA 13R: STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN LOW-RISE RESIDENTIAL OCCUPANCIES**  
Current Edition: 2013 Next Edition: 2016  
[Free access to the 2013 edition of NFPA 13R](#)

What is NFPA 13R?  
NFPA 13R is a residential occupant design standard based on low-rise residential occupancies. The Standard's intent is to provide a sprinkler system that adds to the control of residential fires and provides improved protection against injury and life loss in multi-family dwellings.

### History of standard development

- NFPA 13**
  - First issued in 1896 (119 years)
- NFPA 13D**
  - First issued in 1975 (40 years)
- NFPA 13R**
  - First issued in 1989 (26<sup>th</sup> anniversary)

NFPA 13 is the fifth most used standard within all NFPA codes and standards

Over 119 years old and they are still tweaking or adding definitions "Control valve", "Obstruction", "Cross mains", "System Riser"

Standard was created 6+ years before "Residential" specific sprinklers were listed

Mid-80's there started to be a low-rise residential mix of apartments and hotels

**NFPA 13R: STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN LOW-RISE RESIDENTIAL OCCUPANCIES**

Revision cycle information  
Revision Cycle: Annual  
Revised Edition Date: 2016

First Draft (previously Report on Proposals (ROP))  
Public Hearing Date: 8/3/2014  
First Draft Report Posting Date: 3/19/2014 (First Draft Report)

**Our Sprinkler Bibles**

Residential Fire Sprinklers - 360

**NFPA STANDARDS DEVELOPMENT SITE PUBLIC COMMENT STAGE**  
Closing Date: May 16, 2014

**IMPORTANT NOTICE:** Due to changes in the latest version of the Google Chrome browser, the NFPA e-Public Submissions System is currently experiencing a problem with this browser. If you are using Google Chrome and receive an XSLT Forms Exception Error, please use Firefox or Internet Explorer (IE) as your browser.

Welcome to the NFPA Standards Development Site

This is the entry point for anyone who wants to participate in the NFPA Standards development process. The second stage of the development process is called the Comment stage, as described in the Regulations Governing the Development of NFPA Standards at Section 4.4. In this stage, you can propose changes to the First Draft NFPA Standard that the responsible Technical Committee (and, where applicable, Consulting Committee) will consider when developing the next edition of a standard. These proposed changes are called Public Comments, which you can propose and submit electronically in this section of the site.

In this section, you can submit a Public Comment to:

- Add New Section(s)
- Revise First Draft Section(s)
- Create a Global revision to add, modify, or delete a word or phrase throughout the entire document.

Click on the appropriate icon above to get instructions on how to begin submitting your Public Comment. When you are ready to begin the Public Comment process, please utilize the Table of Contents on the left side of this screen to navigate to the portion of the Standard where you want to propose a change. Once initiated all Public Comments are auto-saved throughout the completion process. You will be given an opportunity to submit each Public Comment (proposed change) to NFPA once you have completed all the required sections. Additionally, you may delete your submitted Public Comment up until the Public Comment closing date, as displayed on the top of the screen.

### Three standards, one goal, not one size fits all


- NFPA 13**
  - Standard for the installation of Sprinkler Systems – 2013 Edition
- NFPA 13R**
  - Standard for the installation of Sprinkler Systems in Low-Rise Residential Occupancies – 2013 Edition
  - (Not more than 4 stories in height, not more than 60 ft. above grade)
- NFPA 13D**
  - Standard for the installation of Sprinkler Systems in One- and Two-Family dwelling and Manufactured Homes – 2013 Edition
  - (One, Two-family homes and Manufactured homes)

**360** Three standards, one goal, not one size fits all

- 
  - NFPA 13
    - Countless Occupancies or Mixed Occupancies
    - Hazard based protection
- 
  - NFPA 13R and D
    - Occupancy known (For the most part)
    - Unique challenges
    - Different water discharge needs
    - Significantly improve the occupants safety



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**360** Possible Trade-Offs vs Trade-Ups



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**360** Three standards, one goal, not one size fits all

- 
  - NFPA 13
    - To provide a reasonable degree of protection for life and property from fire
- 
  - NFPA 13R and D
    - To provide a sprinkler system that aids in the detection and control of residential fires and thus provides improved protection against injury, life loss and property damage
    - Prevent flashover in room of origin
    - Improve chance for escape or evacuation

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**360** Possible Trade-Offs vs Trade-Ups

- Street Width Reduction:** Traffic lanes may be narrowed
- Longer Dead-end Streets:** Dead-end streets may be increased in length allowing additional building lots to be accessed



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**360** Benchmark

**Residential applications**

- For the purpose of this presentation I will reference the 2013 with insight to 2016
- At all times and within each and every jurisdiction we must confirm which document we are design to
- There is no owners certificate for use to reference like in NFPA 13 (A.23.1)
  - Architectural and Builder trade-offs may require us to increase the protection
  - Owners insurance company any only give credit to a NFPA 13 system

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**360** Possible Trade-Offs vs Trade-Ups




- Increased Hydrant Spacing:** Supply mains may be reduced and hydrant spacing can be increased
- Decreased Death Rates and Property Loss:** Over time, communities with fully sprinklered developments should see a decrease in fire death rates and property loss (Case study data available)

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### 360 Possible Trade-Offs vs Trade-Ups


- **Tee Turnarounds Permitted:** The permitted use of tee turnarounds in sprinklered developments can create at least one additional lot per cul-de-sac
- **Increased Street Grades and Building Setbacks:** Steeper street grades and building locations further from paved fire vehicles access may be permitted.



### 360 Statistics and related data

**487,500** structure fires occurred in the U.S. during 2013.


- A slight increase of 1.5% from 2012
- **2,855** civilian fire deaths
- **14,075** civilian fire injuries
- **\$9.5 billion** in property damage
- One structure fire was reported every 65 seconds



Source: <http://www.nfpa.org/~media/Files/Research/NFPA%20reports/Overall%20Fire%20Statistics/osfireloss.pdf>

### 360 Possible Trade-Offs vs Trade-Ups

- **Additional Units Permitted:** Although the actual percentage may vary, increases up to 20 percent are not uncommon
- **Expansion of Existing Water Supply May Not Be Needed:** Required fire flows for fully sprinklered developments can be greatly reduced compared to non-sprinklered developments



### 360 Statistics and related data

**Home Fire Losses in Participating Provinces and Territories**

**Percent Distribution of Home Fires by Type of Home**

Type of Home	% Fires	% Deaths	% Injuries
One/Two Family Dwellings	74	78	62
Apartments, Tenements, Flats	24	17	36
Mobile Homes	2	5	2

This Table summarizes data for BC, AB, MB, ON, NB, NS (for 2007); SK (for 2008); and NT (for 2003-2007).

Source: <http://www.cfmfc.ca/stats.html>


### 360 Statistics and related data

**CANADIAN DATA**

- Fires in residential properties accounted for an average of 69% of all structure fires and 79% of all the structure fire deaths.(2007)

**UNITED STATES DATA**

- Fires in residential properties accounted for an average of 78% of all structure fires and 83% of all the structure fire deaths (2007)

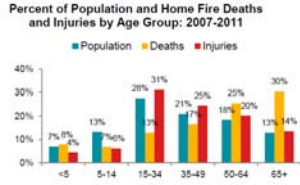


Source: <http://www.cfmfc.ca/stats.html>

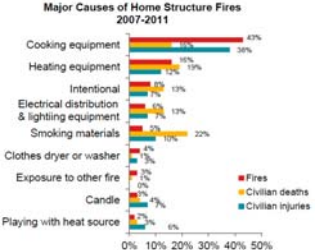
### 360 Statistics and related data

**NFPA, Fire Analysis and Research Division Data**

**Percent of Population and Home Fire Deaths and Injuries by Age Group: 2007-2011**



**Major Causes of Home Structure Fires 2007-2011**




References for "An Overview of the U.S. Fire Problem" 2014

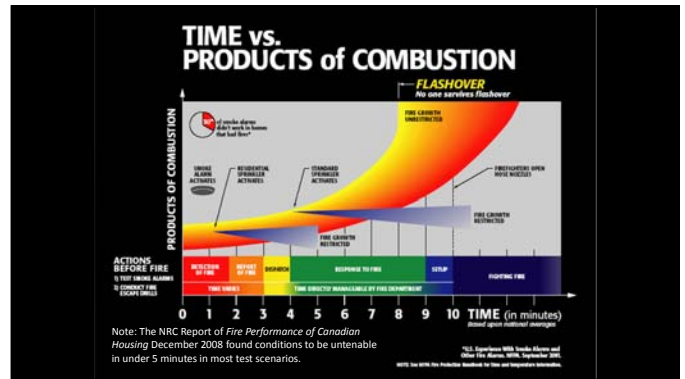
### 360 Statistics and related data

**CANADIAN and UNITED STATES AVERAGED AND UPDATED**

- Fires in residential properties account for an average of :
  - 80% of all structure fires
  - 80% of all the structure fire deaths.



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### Home Fires in Canada by Area of Fire Origin

Area of Origin	Fires	%	Deaths	% Deaths	Injuries	% Injuries
Kitchen	2,955	22	20	12	334	29
Outside Area (inc porch, balcony, court, patio, terrace, lawn, other...)	1,201	9	5	3	47	4
Bedroom	1,136	9	35	20	242	21
Living Room	1,077	8	56	33	198	17
Chimney - masonry/factory built, metal, flue-pipe: gas-vent	690	5	2	1	6	1
Vehicle garage...	600	5	6	3	45	4
Exterior Wall	475	4	0	0	8	1
Laundry Area	421	3	2	1	24	2
Washroom	241	2	2	1	26	2
Heating equipment room	221	2	0	0	16	1
Other Areas (<=1%)	2,940	22	31	18	195	17
Undetermined/Unknown	1,299	10	14	8	27	2
<b>Total</b>	<b>13,256</b>	<b>100</b>	<b>173</b>	<b>100</b>	<b>1,168</b>	<b>100</b>

Source: <http://www.ccfmfc.ca/stats.html>

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### Side-by-Side video



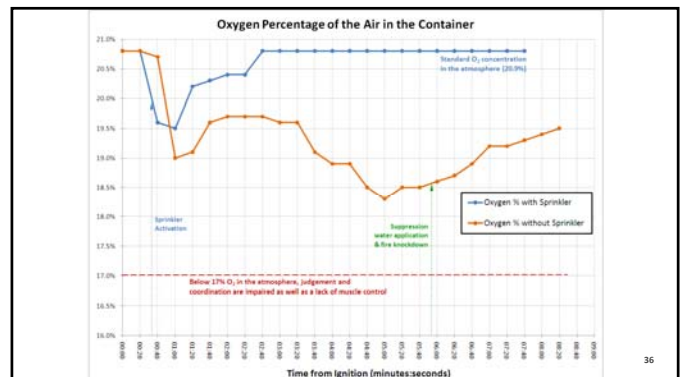
www.firesprinklerinitiative.org

### 360 Three standards, one goal, not one size fits all

- NFPA 13
  - Countless Occupancy or Mix Occupancies
  - Hazard based protection
- NFPA 13R and D
  - Occupancy known
  - Unique challenges
  - Different water discharge needs
  - Significantly improve the occupants safety

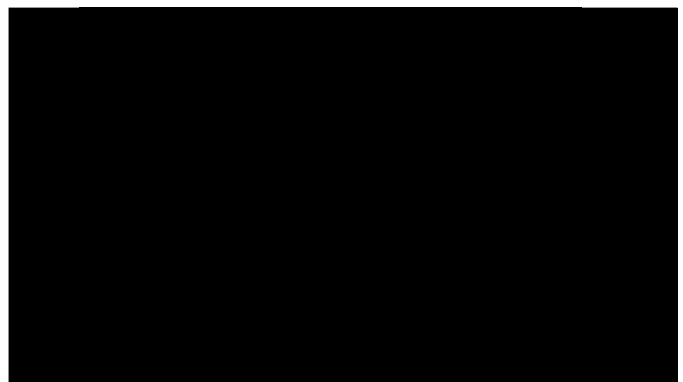
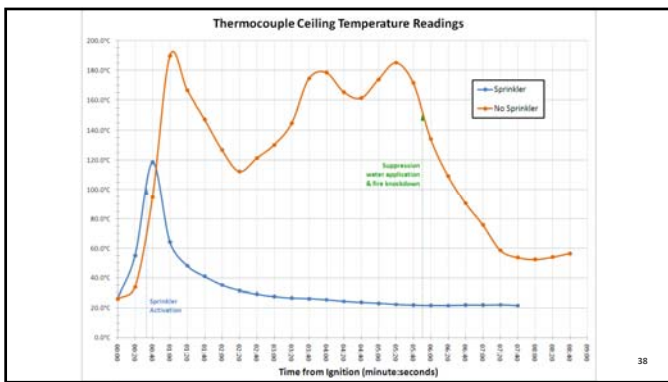
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### 360 Fire Dynamics vs Human Skin

° C	° F	Response
37	98.6	Normal human oral/body temperature
44	111	Human skin begins to feel pain
48	118	Human skin receives a first degree burn injury
55	131	Human skin receives a second degree burn injury
62	140	A phase where burned human tissue becomes numb
72	162	Human skin is instantly destroyed
100	212	Water boils and produces steam
140	284	Glass transition temperature of polycarbonate
230	446	Melting temperature of polycarbonate
250	482	Charring of natural cotton begins
>300	>572	Charring of modern protective clothing fabrics begins
>600	>1112	Temperatures inside a post-flashover room fire

[http://www.nist.gov/fire/fire\\_behavior.cfm](http://www.nist.gov/fire/fire_behavior.cfm)




- ### 360 HFSA and FM Global Research Data:
- Home Fire Sprinklers Now Proven to Protect the Environment:
- Reduced greenhouse gases by 98%
  - Reduced water usage by up to 91%
  - Reduced fire damage by up to 97%
    - Unsprinklered room = 100% damage
    - Sprinklered room = 3% damage
  - Reduced water pollution

- ### 360 What has changed?
- Floor plans
    - Much more open, Less compartmentation
  - Construction materials
    - Dimensional lumber
    - Engineered beams and truss
    - Exterior combustible finishes
      - (siding, landscaping mat)
  - Construction methods
    - Connection types, fasteners
    - Pre-fabrication, off-site construction
  - Fuel loading
    - Extended use of synthetic materials
      - Foams, plastics
    - Occupant use may be "non-traditional"
    - Compulsive Hoarding

## 360 Defining Modern Furnishings

- Uses synthetic materials, such as polyurethane; increased damage in home fires, burn more quickly than legacy furnishings
- Non-survivable conditions occur sooner, causes accelerated flashover and severely reduced escape time
- Underwriters Laboratories video: Side-by-side comparison of two living room fires (left side: legacy room; right side: modern room)



In November 2009, Underwriters Laboratories conducted a side by side comparison of two simulated living room fires. The purpose was to gain knowledge on the difference between modern and legacy furnishings. The rooms measured 12 ft by 12 ft with an 8 ft ceiling and had an 8 ft wide by 7 ft tall opening on the front wall. Both rooms contained similar amounts of like furnishings.

Both rooms were ignited by placing a lit stick candle on the right side of the sofa. The fires were allowed to grow until flashover.

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## Causes of Home Fires in Canada

Causes	Fires*	% Fires	Deaths	% Deaths	Injuries	% Injuries
Cooking**	2,562	20	11	7	290	27
Heating Equipment	1,631	12	2	1	65	6
Arson/Set Fire	1,477	11	16	10	83	8
Electrical Distribution Equipment	1,092	8	11	7	60	6
Smoking	900	7	36	22	92	9
Candle	337	3	5	3	50	5
Appliances/Equipment	312	2	0	0	7	1
Exposure Fire	265	2	1	1	4	0
Clothing Dryer	231	2	6	6	8	1
Lighting Equipment	222	2	0	0	13	1
Cutting/Welding Equipment or Blow Torch	205	2	0	0	18	2
Child Playset	122	1	5	3	19	2
Flammable Comb. Liquid Synthon	89	1	1	1	24	2
Flammable Gas Synthon	33	0	2	1	2	0
Other	3,026	23	72	44	332	31
Causes Unknown	13,124	100	162	100	1,067	100
<b>Total</b>						

\*This table contains data for one- to four-family dwellings, apartments and mobile homes in BC, AB, MB, SK, NB, NS (for 2007), ON (for 2008), NT (averaged for 2003-2007). Thus, the totals may reflect fire losses for these periods.

Residential Fire Sprinklers - 360

Protecting ourselves from ourselves




Source: <http://www.ccfmfc.ca/stats.html>


## 360 Modern Furnishings: A Visual

- Polyurethane significantly reduces the time it takes for a room to burst into flames

Legacy Furnishing Fire  
(leather furniture)




1 minute, 50 seconds




4 minutes, 25 seconds

Modern Furnishing Fire  
(synthetic furniture)



1 minute, 50 seconds





4 minutes

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## 360 It's us not them

- Empty buildings seldom burn, the occupants are the generally the ignition source.

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## 360 Videos... vs first hand experience!

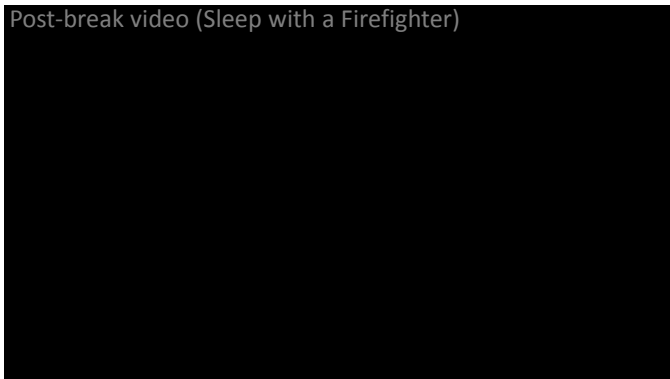
- Too close....



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## Pre-break video (Fresno FD PSA)





**360 Fundamental differences (Continued)**  
**Significantly improve the occupants safety**

**Water flow used more efficiently:**

- NFPA 13 requires Residential portions to have the same discharge flow as light hazard 0.1 gpm/sq<sup>2</sup>
  - Flow and Pressure requirements are determined by sprinkler area x density
- NFPA 13 R/D requires Residential Sprinkler to discharge 0.05 gpm/sq<sup>2</sup>
  - Flow and Pressure requirements are determined by sprinkler manufacture data sheets.
  - Caution:** Residential sprinklers are not interchangeable a 20' x 20' R3516 is not the same as a V2902

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2013 NFPA 13D Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes

2013 NFPA 13 Standard for the Installation of Sprinkler Systems

2013 NFPA 13R Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies

Residential Fire Sprinklers - 360

**Our Sprinkler Bibles**

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**360 Fundamental differences**  
**Higher wall wetting requirements**



**Spray patterns**

Standard Spray Sprinkler

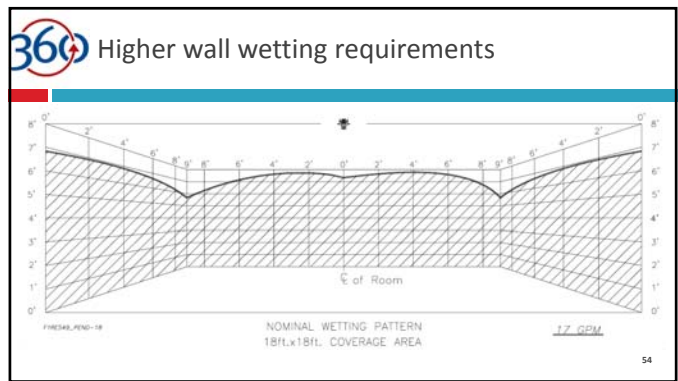
Residential Sprinkler

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**360 Starting differences**  
**Significantly improve the occupants safety**

Standard Spray Sprinkler	Residential Sprinkler
First introduced in 1875 by Henry Parmalee	First introduced in 1981 by the Grinnell Corporation
Temperature activation	Faster response characteristics
Water directed downwards with a percent upward	Water flow used more efficiently
	
	Water distribution greatly changed

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### 360 Higher wall wetting requirements

Standard Spray Sprinkler: 36"

Residential Sprinkler: 30"

Consider that impact of ceiling mounted obstructions

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### 360 Fundamental differences (Water supply sources)

- 13R
  - A reliable waterworks system (With or without an automatically operated pump)
  - An elevated tank
  - A pressure tank designed to ASME standards
  - A stored water source with an automatically operated pump (NFPA 70 and 20, Listed)
- 13C
  - Item 1, 2, 3
  - A stored water source with an automatically operated pump (NFPA 70 but not listed)
  - A well with a pump of sufficient capacity to pressure to meet the system demand

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### 360 Fundamental differences (Water supply needs)

- 13
  - Depending on the design method
    - As small as 900 sq<sup>2</sup> + 100 gpm required hose stream x duration 30 min
- 13R
  - Minimum number of sprinklers to calculate = 4
    - Designer must ensure that the largest floor area = the largest demand
    - Four sprinklers spaced 12' x 12' may not be as demanding as two spaced 20' x 20'
    - Inside and outside dwelling unit considerations must be carefully reviewed.
    - Section 7.1, 7.2 and 7.3
- 13C
  - Minimum number of sprinklers to calculate = 2
    - Same as above with

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### 360 Fundamental differences

- Hydraulic calculation methods
- Early Suppression Fast Response (ESFR)
- Control Mode Specific Application (CMSA)

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### 360 Fundamental differences (Water supply needs)

- 13
  - Depending on the hazard and method used 30 min
- 13R
  - Minimum water supply duration not less than 30 min
- 13C
  - Minimum water supply duration not less than 10 min\*
    - \* Where stored water is the sole source of supply the minimum quantity shall be permitted to be reduced to 7 minutes when the dwelling is only one story and less than 2000 ft<sup>2</sup> (Manufactured homes)

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### 360 Fundamental differences

- Hydraulic calculation methods
- Control Mode Density Area (CMDA)
  - High temp reductions
  - Quick response reductions
  - Sloped ceiling increases
  - Dry system increases
  - Small room allowance
  - Q = Hazard Density x As
  - Q = K V P
- Residential (13R and 13D)
  - 4 SPR max, 30 minute (13R)
  - 2 SPR max 10 minute or 7 minute (13D)
  - Simple pressure loss method (13 D, 10.4.3)
  - Prescriptive calculation (13D Introduced in 2010)
  - All flow and pressure information is determined by the product listing

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### 360 System Arrangements

- Stand-alone piping arrangement (3/4" Min size)
  - Tree
  - Loop
  - Grid
- Multi-purpose
  - (3/4" Min size)
  - Supplies both the sprinklers and domestic fixtures
- Network system
  - (3/4" Min size)
  - Each sprinkler must have three separate water paths
  - Several other restrictions apply

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### 360 Location of sprinklers in all areas except

Home Fires in Canada by Area of Fire Origin

Area of Origin	Fires	%	Deaths
Kitchen	2,955	22	20
Outside Area (inc porch, balcony, court, patio, terrace, lawn, other...)	1,201	9	5
Bedroom	1,136	9	35
Living Room	1,077	8	56
Chimney - masonry/factory built, metal, flue-pipe, gas-vent	690	5	2
Vehicle garage...	600	5	6
Exterior Wall	475	4	0
Laundry Area	421	3	2
Washroom	241	2	2
Heating equipment room	221	2	0
Other Areas (<=1%)	2,940	22	31
Undetermined/Unknown	1,299	10	14
<b>Total</b>	<b>13,256</b>	<b>100</b>	<b>173</b>

- Bathrooms less than 55 sq.ft
- Clothes closets, linen closets and pantries that meet all of the following:
  - Less than 24 sq.ft
  - Least dimension 3 ft
  - Walls and ceiling noncombustible or limited combustible
- Open porches and attached porches
- Attics, machine rooms, elevator shafts, and concealed space (no fuel-fired equipment)

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### 360 System Components

- New Sprinkler heads, Listed Residential
- No spare sprinklers are required
- All Devices and Materials used shall be listed, No unusual exceptions
  - Except
    - Tanks, expansion tanks, pumps, hangers, WFD, WF-valves
- Pipe working pressures vary for Steel and nonmetallic 130 psi @ 120°F (5.2.2.2.2)
- New Sprinkler heads, additional criteria expanded but still listed
- A spare stock of at least six on premises
- All Device and Materials used shall be listed, No unusual exceptions
- Pipe working pressures vary for Steel and nonmetallic 175 psi @ 120°F (5.2.2.2.2)

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### 360 Comparison NFPA Standards for Residential Occupancies

(NFSA Chapter 36 Modified Table 36-2)

	NFPA 13	NFPA 13 R	NFPA 13D
Application	All buildings except one and two family dwellings	Residential occupancies (apartments, hotels, rooming houses board and care) < 60ft	Single family dwellings, two family dwellings and manufactured homes
Install Sprinklers	Everywhere except in some special locations 8.15.8	Everywhere except as previously noted	Everywhere except as previously noted
Type of Sprinklers	QR, QREC, Residential	Residential, QR or QREC in very small dwelling units	Residential only
Number of Design Sprinklers for Water Supply Sizing	4 if Residential, usually 5 if QR or QREC	Up to 4 for Residential, usually 5 for QR or QREC	2 Residential
Water Supply Duration	30 minutes (Light Hazard)	30 minutes	10 minutes (7 min for small dwelling units)
Hose Stream Demand	100 gpm (Light Hazard)	None	None

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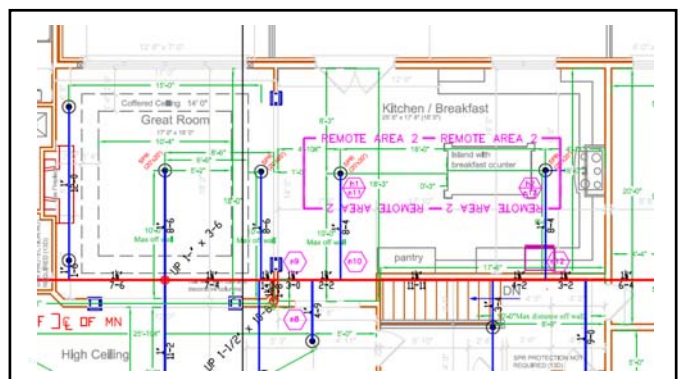
### 360 Location of sprinklers in all areas except

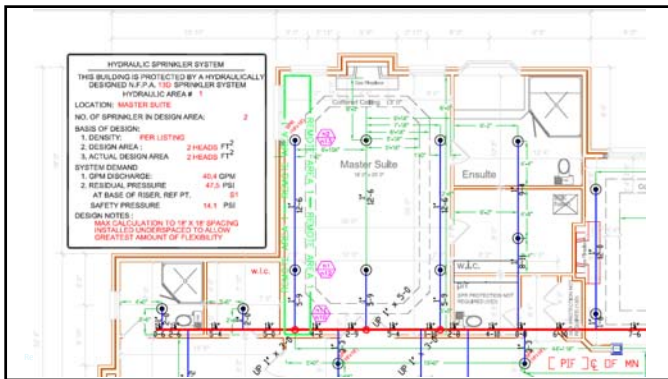
- Bathrooms less than 55 sq.ft
- Clothes closets, linen closets and pantries that meet all of the following:
  - Less than 24 sq.ft
  - Least dimension 3 ft
  - Walls and ceiling noncombustible or limited combustible
- Garages, carports and open attached porches and similar structures
- Attics, machine rooms, elevator shafts, and concealed space (no fuel-fired equipment)
- Covered unheated projections at egress

Home Fires in Canada by Area of Fire Origin

Area of Origin	Fires	%	Deaths
Kitchen	2,955	22	20
Outside Area (inc porch, balcony, court, patio, terrace, lawn, other...)	1,201	9	5
Bedroom	1,136	9	35
Living Room	1,077	8	56
Chimney - masonry/factory built, metal, flue-pipe, gas-vent	690	5	2
Vehicle garage...	600	5	6
Exterior Wall	475	4	0
Laundry Area	421	3	2
Washroom	241	2	2
Heating equipment room	221	2	0
Other Areas (<=1%)	2,940	22	31
Undetermined/Unknown	1,299	10	14
<b>Total</b>	<b>13,256</b>	<b>100</b>	<b>173</b>

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**FIREFIIGHTERS' SECOND BEST FRIEND**

HOME FIRE SPRINKLERS

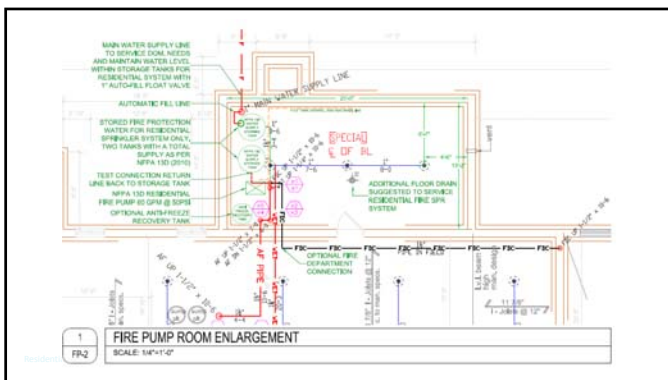
Save Your Life. Your Loved Ones. Your Property.

FEMA

**HOME FIRE SPRINKLERS**

Your Best Friend when fire strikes your home.

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**Residential Fire Sprinkler POE – York Chapter 2015**

- Do not work in isolation. The objectives of all parties needs to remain focused on the common goal of reducing and eliminating any fire related deaths or related injuries.
- Three types of defence
  - Education
  - Standards and enforcement
  - Emergency response

**SPRINKLERS: MY NEW BEST FRIEND.**

Fire. SPRINKLERS SAVE FIREFIIGHTERS' LIVES TOO Firehouse

Residential Fire Sprinklers : 360

**Any questions**

Residential Fire Sprinklers : 360

**Residential Fire Sprinkler POE – York Chapter 2015**

- We have the ability to delivery water for suppression faster then any Fire Department in the world.
- I do not want to hear of a fire related injury of death in residential construction. We have the cure.
- There should be ZERO tolerance for fire related injuries or deaths.

**SPRINKLERS: MY NEW BEST FRIEND.**

Fire. SPRINKLERS SAVE FIREFIIGHTERS' LIVES TOO Firehouse

Residential Fire Sprinklers : 360

## Final Question?

Residential Fire Sprinklers : 360

Residential Fire Sprinklers : 360
End

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## Which one-time purchase do you choose?

Average new home cost in Canada	\$ 405,233	CN	<a href="http://www.crea.ca/content/national-average-price-map">http://www.crea.ca/content/national-average-price-map</a>
Average new home size in Canada	1900	sq.ft.	<a href="http://www.sblha.ca/uploads/pulse%20survey%20results/main%20report2012.pdf">http://www.sblha.ca/uploads/pulse%20survey%20results/main%20report2012.pdf</a>
<b>Funeral Cost *</b>			
Person - US	\$ 8,343	US	<a href="http://nifa.org/about-funeral-service-trends-and-statistics.html#costs">http://nifa.org/about-funeral-service-trends-and-statistics.html#costs</a>
Person - CN (Ont)	\$ 7,386	CN	<a href="http://www.funeralboard.com/PublicUploads/22342QuickFacts2013.ng.pdf">http://www.funeralboard.com/PublicUploads/22342QuickFacts2013.ng.pdf</a>
Funeral cost / sq.ft	\$ 3.89	*	
<b>Fire Sprinkler Cost **</b>			
Average cost of a sprinkler system / sq.ft	\$1.35	**	<a href="http://www.homefiresprinkler.org/index.php/fire-sprinkler-answers">http://www.homefiresprinkler.org/index.php/fire-sprinkler-answers</a>
Average cost of a sprinkler system / sq.ft	\$ 2.13	**	1% of a new home cost, Average home cost / average size
Average cost of a sprinkler system / sq.ft	\$ 2.67	**	1.25 of a new home cost, Average home cost / average size
Average cost of a sprinkler system / sq.ft	\$ 3.20	**	1.5% of a new home cost, Average home cost / average size
* Without burial plot costs			
** With suitable water supply, city			

Residential Fire Sprinklers : 360

## Contact information

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Residential Fire Sprinklers : 360