



# UNDERSTANDING FIRE RATINGS

The following is provided as general information on Fire Ratings in building construction as they pertain to Rifeng GasPex and Rifeng WaterPex installations.

IN ALL CASES please refer to the full transcript of our Fire Test reports to ensure that fire rated silicone and fire collars are suitable for use with our products to achieve the fire rating that is required for the nominated building specification.

## Some Basic Information

- a. A Fire Rated Duct is exactly that. It is generally a riser duct that has been constructed to achieve exceed the fire rating required for that situation.
- b. All other riser ducts have not been constructed to achieve a specific fire rating for the building and Fire Collars or Fire Rated silicone or similar will be required to be used for each service penetrating a wall or floor.
- c. (Floor) Riser Ducts are typically required to have a 4 hour fire rating.
- d. Walls are typically required to have a 2 hour fire rating

## Australian Standards (AS1530-4) for Fire Rating and the Building Code of Australia

AS1530-2005 is THE Australian Standard for Methods for fire tests on building materials, components and structures. The objective of the Standard is to provide building designers, manufacturers, test laboratories and regulatory authorities with a set of uniform requirements for heating conditions, test procedures, and criteria for the determination of fire resistance of an element of building construction. This Standard is referenced in the Building Code of Australia and Part 4 of this Australian Standard details the Fire-resistance testing of elements of Construction. This covers testing of fire resistance that relates to installation of pex systems in buildings including Rifeng GasPex and Rifeng WaterPex.

There has been comprehensive testing of products with fire collars and fire rated silicones conducted in accordance with this Standard. This information is available on request.

## The Essence & Implications of Fire Tests as per AS1530-4

AS1530-4 is primarily concerned as to what happens in a building should there be a fire. It particularly considers the following:

- a. Will the Structural Integrity of the Building be compromised?
- b. Will the fire collar, silicone or other similarly functioning element stay intact and close off the penetration through wall or floor in the event of fire? It must not crack or open so that it prevents transfer of flame, smoke or other through walls, floors and ceilings.
- c. Will the fire collar, silicone or other similarly functioning element provide sufficient insulation against heat between each side of the wall, floor or ceiling?



A test assembly is prepared utilizing the materials intended to be used to construct the actual internal walls or floor of the building, the brand of piping intended to be installed and a range of fire resisting options for the wall penetrations such as fire collars, fire proof silicone and the like. A furnace is set up on one side of the test wall and the fire resistance performance of wall and penetrations monitored. Throughout the course of the test, observations are made of the behavior of the assembly with particular emphasis on structural adequacy, integrity and insulation. All significant events are recorded and the time of their occurrence noted. The test results are stated in terms of the time elapsed from the start of the test until failure occurs for each of the items of Structural integrity, and Integrity and insulation of the penetration. The results are expressed as a Fire Resistance Level (FRL) and are shown in the form of xx/-/- for a structural beam or column or -/yy/zz for a non load bearing wall. The -/yy/zz format is that which is applicable to pex systems. In -/yy/zz, the “-” refers to the structural integrity, the “yy” refers to the integrity of the penetration and the “zz” refers insulation effectiveness of the penetration.

#### **Interpreting FRL's**

If a wall or floor is required to have a 4 hour fire rating, the integrity and insulation of the penetration must not fail within 4 hours of testing as conducted in accordance with AS1530-4. Both integrity and insulation are equally important.

So for a 4 hour rating we would expect the test report to show a FRL of -/240/240 where 240 represents 240 minutes or 4 hours.

If a test report showed an FRL of -/90/120, this would indicate that the FRL of the integrity of the penetration (fire collar or silicone) is 90 minutes (one and a half hours) and the FRL related to the insulation is 120 minutes (2 hours).

The FRL of the penetration is 90 minutes being the lower number in the above example.

The following pages show summary results of FRLs for a range of fire collars and sealants. In assessing whether any collar or sealant is compatible with Rifeng GasPex or Rifeng WaterPex products and the specific installation requirements, FULL reports should be requested and assessed. All reports are available on request.

### Likely Fire Resistance of Concrete, Plasterboard and Masonry Floors and walls with SNAP Fire Collars

Refer to CSIRO Assessment number FC)-2719 available on the SNAP Fire Collar web site at [http://snapcollars.com.au/uploads/fsp1339\\_gas\\_floor\\_1.pdf](http://snapcollars.com.au/uploads/fsp1339_gas_floor_1.pdf)

Based on the observed performance during full scale penetration testing it is the opinion of the division of CSIRO that the systems tabulated below comprising Rifeng GasPex PEX-AL-PEX composite gas pipes would be capable of achieving the designated fire resistance levels if tested in accordance

Collar	Pipe Sizes				FRL	System	Element
SNAP32GAS	16	20	25	32	-/240/240	Retro-fit	Concrete**
SNAP50GAS	32	40	50		-/240/240	Retro-fit	Concrete**
SNAP50HGAS	32				-/240/240	Cast-in	Concrete**
SNAP50HGAS		40	50		-/240/240	Cast-in	Concrete**
SNAP63GAS	63				-/240/240	Retro-fit	Concrete**

SNAP32GAS	16	20	25	32	-/120/120	Retro-fit	Plasterboard*
SNAP50GAS	32	40	50		-/120/120	Retro-fit	Plasterboard*
SNAP32GAS	16	20	25	32	-/180/180	Retro-fit	Plasterboard*
SNAP50GAS	32	40	50		-/180/120	Retro-fit	Plasterboard*
SNAP32GAS	16	20	25	32	-/180/180	Retro-fit	Masonry***
SNAP50GAS	32	40	50		-/180/120	Retro-fit	Masonry***

\* The Designated FRL is where the system is installed into a plasterboard lined framed wall system an FRL of either -/120/120 or -/180/180 with the FRLs of the penetration system is altered to match that of the wall system

\*\* The Designated FRL is where the system is installed into a concrete slab with an FRL of 240/240/240. For slab systems with lower FRLs the FRLs of the penetration system is lowered to match that of the slab

\*\*\* The Designated FRL is where the system is installed into a masonry or concrete wall with an FRL of either -/180/180 or 180/180/180. For masonry or concrete wall systems with lower FRLs the FRLs of the penetration system is lowered to match that of the slab

### Likely Fire Resistance of 128mm Plasterboard Walls with Fire Pro M707 Sealant and Passive Fire GPFC Collars

The following shows the likely fire resistance performance of Passive Fire GPFC collars and Firepro M707 sealant protecting Rifeng GasPex (pex/al/pex) pipe penetrations through a plasterboard wall tested in accordance with AS1530-4:2005 and assessed in accordance with AS4072.1:2005. The test assembly comprised a section of plasterboard wall of nominally 128mm thickness comprised of 64mm Rondo steel studs faced on each side with 2 layers of 16mm thick fire rated plasterboard.

Service	Criteria	Result
<b>20mm Rifeng GasPex</b> with Fire Pro M707 Sealant	Structural Adequacy	Not Applicable
	Integrity	167 Minutes
	Insulation	115 minutes
	<b>FRL</b>	<b>-/120/90</b>
<b>16mm Rifeng GasPex</b> with Passive Fire GPFC-16 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	181 Minutes
	Insulation	155 Minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>16mm Rifeng GasPex</b> with Fire Pro M707 Sealant	Structural Adequacy	Not Applicable
	Integrity	181 Minutes
	Insulation	138 Minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>25mm Rifeng GasPex</b> with Passive Fire GPFC-16 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	181 Minutes
	Insulation	115 Minutes
	<b>FRL</b>	<b>-/180/90</b>
<b>20mm Rifeng GasPex</b> with Passive Fire GPFC-16 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	181 Minutes
	Insulation	153 Minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>32mm Rifeng GasPex</b> with Passive Fire GPFC-16 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	181 Minutes
	Insulation	111 Minutes
	<b>FRL</b>	<b>-/180/90</b>

### Likely Fire Resistance of 150mm Concrete Slab with Fire Pro M707 Sealant and Passive Fire GPFC Collars

The following shows the likely fire resistance performance of Passive Fire GPFC collars and Firepro M707 sealant protecting Rifeng GasPex (pex/al/pex) pipe penetrations through a 150mm concrete slab tested in accordance with AS1530-4:2005 and assessed in accordance with AS4072.1:2005.

Service	Criteria	Result
<b>A 16mm Rifeng GasPex</b> with Fire Pro M707 Sealant	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	149 minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>B 20mm Rifeng GasPex</b> with Passive Fire GPFC-20 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	132 Minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>C 25mm Rifeng GasPex</b> with Passive eFire GPFC-25 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	107 Minutes
	<b>FRL</b>	<b>-/180/90</b>
<b>D 32mm Rifeng GasPex</b> with Passive Fire GPFC-32 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	117 Minutes
	<b>FRL</b>	<b>-/180/90</b>
<b>E 40mm Rifeng GasPex</b> with Passive Fire GPFC-40 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	119 Minutes
	<b>FRL</b>	<b>-/180/190</b>
<b>F 50mm Rifeng GasPex</b> with Passive Fire GPFC-50 Retro fit collar	Structural Adequacy	Not Applicable
	Integrity	No failure at 205 Minutes
	Insulation	119 Minutes
	<b>FRL</b>	<b>-/180/90</b>
<b>G 63mm Rifeng GasPex</b> with Passive Fire GPFC-63 Retro fit collar	Structural Adequacy	Not applicable
	Integrity	201 Minutes
	Insulation	34 Minutes
	<b>FRL</b>	<b>-/180/30</b>
<b>H 16mm Rifeng GasPex</b> with Fire Pro M707 sealant	Structural Adequacy	Not applicable
	Integrity	No failure at 205 Minutes
	Insulation	163 Minutes
	<b>FRL</b>	<b>-/180/120</b>
<b>I 20mm Rifeng GasPex</b> with Fire Pro M707 sealant	Structural Adequacy	Not applicable
	Integrity	No Failure at 205 Minutes
	Insulation	133 Minutes
	<b>FRL</b>	<b>-/180/120</b>