

Recently released addition to the Aquatherm range is the Firestop Sprinkler system manufactured from Fusiolen PPR-80 a specific plastic recyclable non corrosive polymer which will benefit and support the holistic approach of the Green build process and in general terms support **“The cost and benefit of achieving green buildings”**,

### ***Generic green strategy fit of Firestop sprinkler system***

#### **Material composition & recyclability**

Polypropylene is part of the olefin family of plastics and as such is a Polymer free from PVC – Firestop products are necessarily free from PVC free an important part of Green Build.

Fusiolen PPR-80 Type III is a fully recyclable; food grade random co-polymer polypropylene product invented by Aquatherm and in combination with their manufacturing processes and systems employed, has won the fusiotherm range the exclusive **Greenpeace “Future-Proof approved”** rating for their fusiotherm potable water systems.

The addition of fire retardants means firestop fittings are not suitable for Potable water, however the manufacturing processes of the raw material, processing of the pipes and fittings and procedures overviewed by green peace in all aspects are applied to all aquatherm PPR manufactured in Germany to European standards ISO 9000 ff status.

Additives to its pure raw material are no more than 3% of the Firestop System, an essential part of this approval and the materials future decommissioning advantages for recycling here in New Zealand.

Joining of the aquatherm PPR-80 fusiolen systems is by fusion welding – a process that eliminates the need for acetylene, threading and mechanical vitolic in steel fire installations, (and or solvents used in present plastic fire PVC alternatives such as CPVC's). Additionally, fused joints assist the in the lifecycle cost and durability aspects of your green build assessment, since fittings use the same raw material and are mechanically the strongest parts of the system.

#### **Recycling:**

When the service life of the building is up and decommissioning legislation is in process, components will be removed, destroyed, dumped or reused. Aquatherm materials are easily recycled here in New Zealand; being Polypropylene with less than 3 % additives they are re-ground (chipped up) melted into granulate form, then re-extruded and molded into all manner of common Polypropylene products such as bumpers, dashboards, pallets, outdoor furniture etc.

This involves a lot less energy in the process of recycling to mineral materials (crushing and re-melting stages requiring very high energy input levels due to the base hardness and temperature resistances of mineral products).

Importantly recycling firestop does not require the separation of paint/galvanization processes and the dumping of these discarder wastes.

#### **Embodied energy**

The injection molding and extruding manufacturing processes to produce firestop involve heating the raw material and additives to no more than 300 deg c. This is substantially lower therefore than the heat losses involved in manufacture of mineral based pipe systems.

There is also a substantially reduced raw material extraction aspect as the olefin family of plastics is a small percentage derived from oil refinery processes; these involve drilling rather than open cast mining techniques - allowing much faster & cleaner extraction inputs.

## **Painting & surface protection**

The fire industry world wide historically has used mineral based reticulation systems i.e. steel and these are protected from Corrosive elements by painting and more recently galvanized steel.

Heavy metal hot-dip galvanizing is widely used now in the industry and this process adds considerable heat energy and chemical intensive treatment stages with very high ecological negative potential.

Further, where additions are made to Galvanized systems, and or where galvanized systems are not installed; Painting is required on all bare steel surfaces.

Labor material costs and high maintenance inputs are required if painting undercoats and finish coats are involved in the sprinkler fire system.

## **Durability and Life cycle costing**

Aquatherm materials are specifically designed, certified and manufactured to give up to 50- 100 years of service life relative to pressure and temperature requirements. Firestop is fully corrosion resistant comfortably will handle most chemical materials of interest in the full range of pH conditions 1 – 14 externally and internally.

Since Firestop will not corrode and the Polymer is distinctively red in colour it does not need painting service and or component replacement within the life of commercial Residential Health or any Institutional building.

The life-cycle cost of the product is necessarily extremely low compared to mineral based systems.

## **Conclusion**

**By introducing firestop to any Green Build process innovatively progress the following:**

**Consolidate** a “green-fit” on a straight out raw material comparison basis for the sprinkler pipes in the building.

**Reductions** in overall paint use on site to sprinkler pipes (Green builds adopt open space areas frequently and remove ceiling areas), and removal of toxic chemicals and heavy metal galvanizers which in most cases is Kilometers of pipes and fittings in the building at construction and at decommissioning stages..

**Improve Life cycle** costs when compared to traditional steel systems; for potential corrosion surface issues, possible sprinkler head failure due to internal scaling, fusion welded joint will never leak, no paint maintain and 50 year material guarantees.

**Recyclable product** that is environmentally sound both in material composition and in its manufacturing processes, easily recycled and a tradable material for future decommission of the building.

**Utilize materials** that require less energy consumption in their manufacturing processes and origin extraction. Require less energy in their recycled processes compared to mineral materials....end of life is becoming more important with future legislation on deconstruction and disassembly imminent internationally and in New Zealand.

**“Firestop sprinkler systems” support the green initiatives of Client, developer and Contractor. Assisting to derive and consolidate Green initiatives during construction, service and decommissioning of the project. All products are sourced and manufactured in Germany assuring quality product to international controlled standards, full international warranty and approved and certified for use in New Zealand.**

***At what cost and benefit is a green initiative with Firestop, Initial material and labor installation trials have showed firestop to be comparable in rates to traditional sprinkler systems, the overall advantages of this system to a green build initiative is being seen internationally as an essential fit.***

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