Munich RE

Fire Losses in Food and Related Industries for Australia and New Zealand

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1: Summary

In the early 2000's an increase in both frequency and severity of losses in the food manufacturing, storage and distribution industries was noted within the Australia and New Zealand market. Detailed analysis revealed that a predominant issue was the extensive use of Expanded Polystyrene (EPS) as an integral part of the construction materials, particularly in as an insulating material for cool rooms.

The purpose of this paper is to expand upon the properties of EPS making it a valued material for construction, and how it creates additional loss exposure for facilities. A Loss Record for the past 9 years is provided for the large ISR commercial sector, and is followed with a series of analysis for the underwriting of these risks.

2: Properties of Expanded Polystyrene (EPS)

The main common issue identified in the losses listed below is the use of Large Insulated Sandwich Panels (LISP). These have thin metal "skins" containing the core material. The most common core material used in Australia and New Zealand is Expanded Polystyrene (EPS).

The key popular features of EPS are:

- excellent thermal properties (not affected by age)
- durable
- resistant to mildew and will not rot
- no nutritive value to ants or rodents
- suffers little effect from water
- easily cut by hand tools
- excellent shock absorption
- it is cost effective

These features have encouraged its use in a wide range of occupations, but particularly in the general food/food related industries where the insulating properties are keenly appreciated. The issue affects all major industrial nations.

In a fire situation the performance of EPS can be summarised as follows:

- it will melt at temperatures lower than 205 degrees Celsius
- the melted EPS contributes to the fuel
- it allows the rapid spread of fire through the panels, roofing, and walls

- it tends not to smoulder or char, but ignites
- produces large quantities of acrid black smoke, thus hindering fire fighting efforts
- automatic sprinklers of minimal effect due difficulty in penetrating fire envelope (eg. Burn behind metal lining only allowing sprinklers to access melted/pooling material)
- it magnifies loss potential on inherent hazards (eg. a small carton fire spreading to EPS panelling limits any protection devices and firefighting efforts)
- Firefighting efforts are often of minimal efficacy due to rapid spread, inherent difficulties in fire characteristics, and difficulty in fighting fires at internal source because of life safety concerns for personnel (eg. building structural collapse)

3: Claims Experience Australia/ New Zealand, Large Commercial ISR

Each of the following major losses involved the use of sandwich panel insulation:

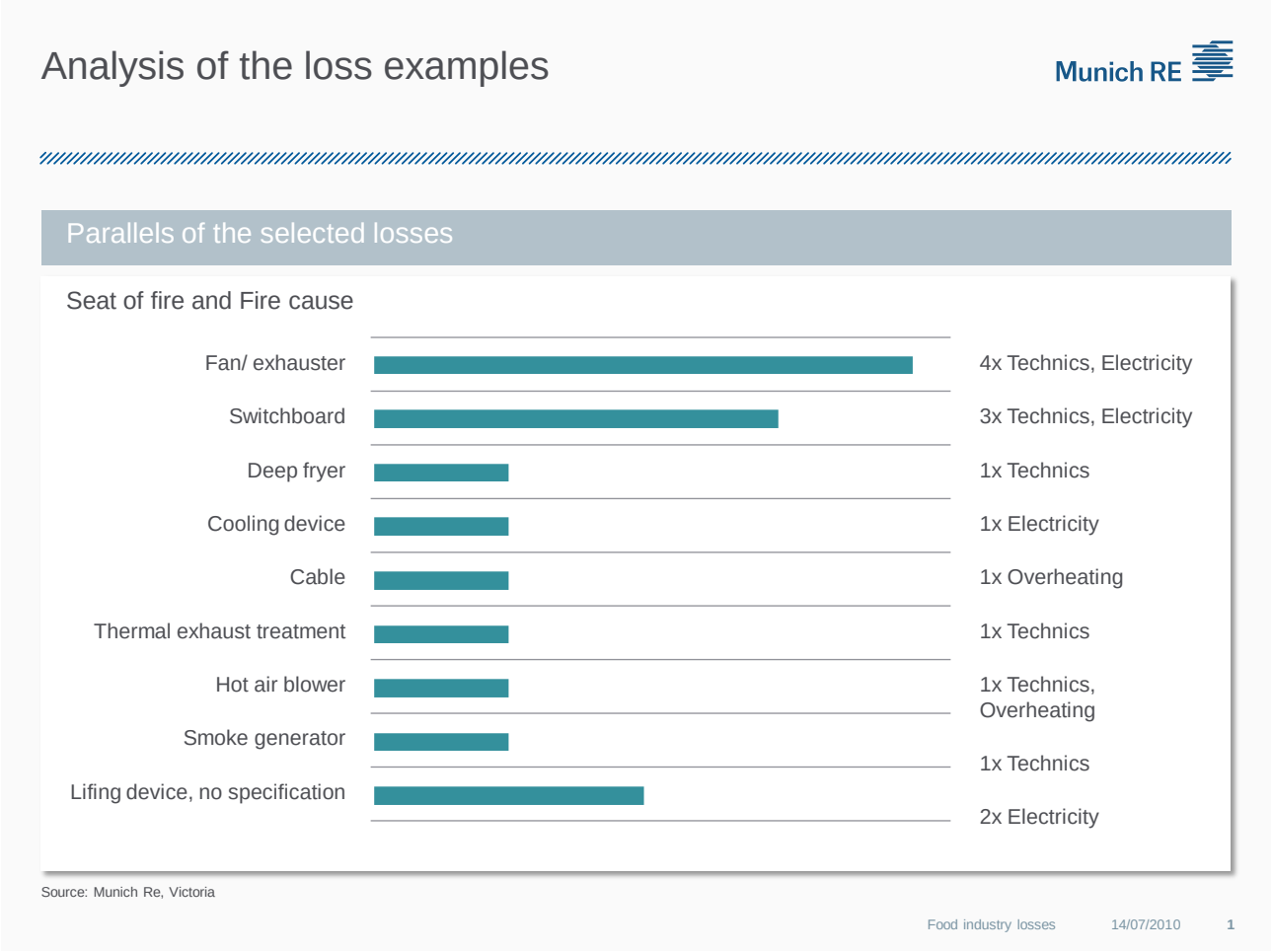
Year	Total Loss	Occupation
2001	$ 14,000,000	Carrot farm/processors
2001	$ 60,000,000	Abattoir
2001	$ 18,600,000	Poultry processors
2002	$147,900,000	Bakery
2004	$ 10,000,000	Chocolate production
2004	$ 20,500,000	Abattoir
2004	NZ $ 27,000,000	Dairy
2004	NZ $ 9,500,000	Cold store
2005	NZ $ 11,200,000	Food wholesalers
2005	$ 72,000,000	Dairy
2005	$ 15,000,000	Food processor
2006	NZ $ 27,000,000	Meat processor
2007	NZ $ 41,000,000	Poultry processors
2007	$ 32,000,000	Abattoir
2007	NZ$ 4,800,000	Health food mfg
2007	$118,000,000	Smallgoods mfg
2008	NZ$ 7,900,000	Cool Storage
2009	$ 6,000,000	Food production
2009	$ 27,250,000	Meat boning plant
2010	$ 110,000,000	Poultry processors
2010	$ 3,050,000	Abattoir

*The above loss record is reflective of Large Commercial ISR policies where MHA or partnering companies to our Large Loss Report have provided loss data. It is not an exhaustive listing for this category. If you are aware additional losses which should be included please contact MHA.

4: Loss Analysis

In a recent analysis of the food processing industry within the Munich Re global portfolio the following trends were noted:

- 14 of 15 losses were due electrical systems (overheating, shortcircuits, etc.). The seat of the fire was in various locations as per the summary diagram below.



- The fires originate from production (7 of 19 losses), smoke house (5), storage incl. packaging (2), mechanical room (1).
- Losses were found to be nearly all 100% of TSI (PD and BI) for each location involved

5: Additional Causes of Increased Loss Potential

A number of additional items are of note in creating additional loss potential:

- Product contamination from smoke damage due health concerns
- Fire load from stored packing materials, often heavy use of cardboard and polystyrene components, and high rack storage
- Cold storage – potential for product loss due temperature fluctuation

- Ammonia refrigeration – toxicity creates contamination risk and flammability adds to fire load
- Rendering – flammable liquids (oils/fats) and explosive dusts (bone meal, blood meal)
- Public authorities – Business Interruption susceptibility due heavy regulation

6: Loss Prevention

Based on the analysis of losses, some key items for loss prevention are highlighted as follows:

- Risk Management – formalized procedures and diligent asset management program
- Housekeeping – Panel surveys/repair as part of day to day operation regimen
- Effective electrical and equipment maintenance program, specifically utilizing frequent thermographic scanning
- Ammonia contamination devices (eg. exhaust fans, etc)
- Business continuity planning
- Hot and Cold Work Permit systems
- Spot protection for hazardous processes (eg. rendering operations)
- Key requirement for surveying is identification of EPS panels versus PIR, as many facilities utilize both depending cooling requirements (EPS provides better refrigeration characteristics, sometimes mandating its usage in sections of facilities)
- Sprinkler system quality is stringent due to EPS properties, thereby a tailored solution often is required and should be vetted by specific design experts

13/10/10 End