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Sawmills – A Challenge for the Insurance Industry?

by Leo Ronken, Gen Re, Cologne

Reports of fires in sawmills are constantly appearing in the press. Between 2015 and 2017, a total of 79 sawmill fires were reported in Germany, Austria and Switzerland. For some time now, organisations – such as the Association of the German Sawing and Wood Industry (Verband Deutsche Säge- und Holzindustrie, DeSH) – have been signalling that it is becoming increasingly difficult for sawmill operators to find insurance cover with reasonable premiums, at least in Germany.¹

After briefly outlining the typical structure of a sawmill, as well as the related current market situation and its challenges, this article discusses potential risks and preventative measures. It also presents some thoughts on the underwriting of sawmills.

Definition

Sawmills are economic enterprises that process logs delivered by forestry by turning them into boards and beams. The products of sawmills are sometimes processed further downstream.

The main product is sawn timber that is used for glued laminated timber, construction timber, solid wood boards, planed wood, profile wood or for various building purposes (roof construction, roof cladding, exterior cladding, etc.).

The by-products of the sawing process are also used. Bark is burnt for heating purposes (biomass) or transformed into bark mulch; sawdust and screened chips are used as raw materials in the fibre board industry or compressed into pellets; wood chips and off-cuts are mainly used for pulp production in the paper industry, burnt for heating purposes or compressed into pellets.

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About This Newsletter

Created for our clients, our Property Matters publication provides an in-depth look at timely and important topics affecting commercial and personal lines of property insurance. The key areas of a sawmill are as follows:

Log yard

Takes delivery and stores logs

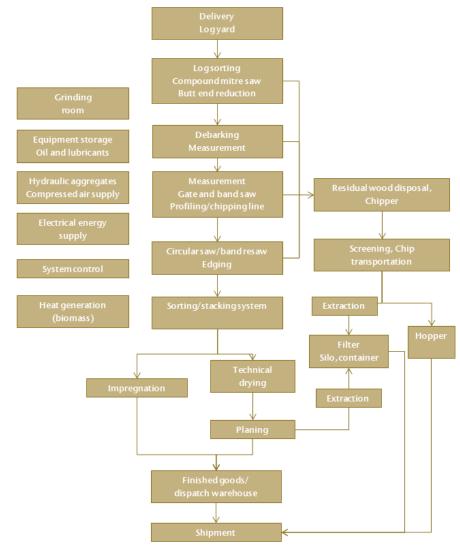
Log sorting system

Handles the debarking, electronic surveying and sorting

Cutting line (saw hall)

Processes logs into sawn timber (The main machines are gate and band saws. Modern systems use chipper-circular saw combinations, chipper-canter lines or frame saw combinations.)

Figure 1 – The key processing stages of a sawmill



Source: Draft "Fire Prevention in Sawmills", VdS 3520²

Sawn timber sorting

Measures and sorts squared timber, planks, boards, etc. elecronically according to size and quality

· Packing/stacking line

Stacks sawn timber for storage or drying or packing it into finished shipping packages.

Drying kiln

Dries sawn timber to the level of wood moisture required for further processing and use

• Finished goods warehouse

Sawmills are often categorised on the basis of their turnover. Small sawmills have a turnover of less than EUR 10 million and an annual cutting volume

> of up to 50,000 cubic metres; large sawmills have a turnover of more than EUR 50 million and an annual cutting volume of 500,000 cubic metres.3 In some cases, however, sawmills are categorised on the basis of other factors, such as value-added steps.

In Germany 91% of sawmills process up to 50,000 cubic metres per year and make up 26.7% of the total cutting volume, whereas large sawmills account for approximately 77.7% of the cutting volume.4

The market situation

For the sawmill industries in Germany, Austria and Switzerland, the market is characterised by surplus capacity. One reason for this is that the annual wood cut quantity is far below the available cutting capacity. Overall, we observe increasing log prices and logistics costs alongside growing pressure on product revenue. Increasing political and legal interventions into forestry (more hardwood, usage restrictions (e.g. national parks and set-asides) and stricter production requirements (e.g. the German Federal Immission Control Act, BlmSchG, and the Technical Instructions on Air Quality Control) are exacerbating this effect.5 In some cases,

attempts are being made to compensate for these problems by importing logs.6

In Germany around 2,000 sawmills still produce 21 million cubic metres of sawn timber each year.⁷ In Austria 1,100 sawmills produce 8.7 million cubic metres of raw wood;8 and in Switzerland around 500 sawmills process 3.5 million cubic metres of sawable logs.9

Overall, the sawmill industries in all three countries are dominated by small-scale operations, although a few larger sawmills process between 40% and 70% of the total cutting volume.¹⁰ As a result, it is increasingly difficult for small sawmills to establish themselves in a market characterised by surplus capacity. Experts estimate that this surplus capacity is a factor of around 2.5.11 Closures, mainly of small- and medium-sized sawmills, will not ultimately lead to a real reduction in capacity.

The overall export rates for sawn timber are high because the wood industry is seen as the foundation of the bio-economy and as such, wood is increasingly being viewed as a necessary alternative in urban construction and for the energy revolution. The market is therefore experiencing growing demand and in turn higher prices. Additionally, more value is being generated due to innovative products, such as wood fibre and hybrid products. Yet despite these positive developments, more and more sawmills are finding it difficult to break even because the costs of innovation necessary to increase value creation (optimisations of processes and methods or the use of green technology) are high.¹² And as mentioned above, the limited availability of logs strengthens the position of the suppliers while buyers of the saw products profit from the ever-present surplus capacity.

In light of these developments, we can observe an ongoing consolidation process that is bringing with it an earnings crisis. As a result, experts are advocating a series of changes that are necessary for the survival of the sawmill industry:13

- Niche strategy
- Customised services

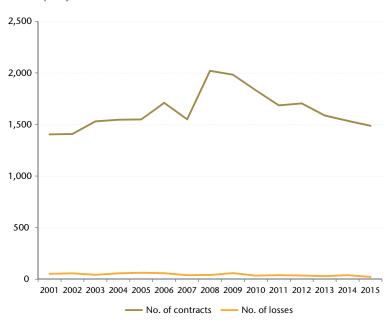
- Additional services
- Increased value creation and vertical integration to provide increasingly refined products
- Losses

Almost no robust statistical information is publicly available concerning losses in the sawmill industry. In Germany only a small amount of highly aggregated information is available from the German Insurance Association (GDV).14

An analysis of press releases between 2015 and 2017 reveals a total of 79 sawmill fires in Germany (55), Austria (19) and Switzerland (5). Details of the extent and scale of losses were scarce, so this press analysis did not provide any robust statistical findings.

In Germany, an analysis of the risk statistics of the GDV appears in Figure 2.

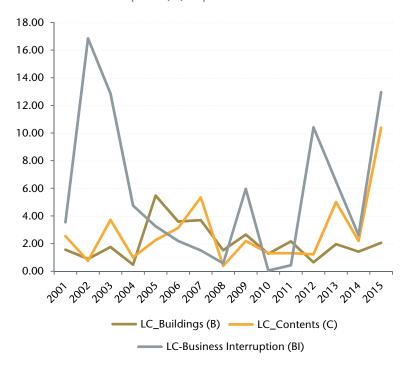
Figure 2 – Analysis of insurance policies number of contracts and losses per year



Source: Own calculations on the basis of GDV risk statistics for businesses in 2015

According to these statistics, approximately 3% of sawmills experience fire-related losses in one year. When we consider the ratio of losses to the insured sums in one year, the trend appears highly volatile (see Figure 3). This so-called loss cost rate (LC) is calculated by dividing the reported losses by the reported insured sums.

Figure 3 – Loss cost (LC) per year for Buildings (B), contents (C) and Business Interruption (BI) in per mille



Source: Own calculations on the basis of GDV risk statistics for businesses in 2015

When we consider the major loss statistics of the GDV, in which all losses in excess of EUR 0.5 million are registered, this aggregated volatility remains evident over the years.

The risk of sawmills

The risk of sawmills results from the nature of their operations and the fact that a flammable material (wood) is handled on a large scale.¹⁵ Here are some particularly noteworthy details:

- Plants in the sawmill and wood industry are considered prone to fires as their operations require a large fire load to be present (combustible raw materials, production products and by-products). There is also a potential risk of explosion in the filters and hoppers.
- The most frequent cause of fire is defective technical equipment and facilities (electrical systems or hot surfaces) as well as human misconduct or arson.
- Buildings usually consist of combustible building materials and components.

- Sawmills are often cramped and as such are sometimes difficult for fire-fighters to access.
- Buildings and the various areas of a sawmill
 often lack effective clearances and partitions (e.g.
 fire zones and complexes); even the various units
 are often connected by conveyors, which means
 that incipient fires can rapidly spread to other
 areas of the sawmill.
- Sawmills do not normally have an automatic fire detection or extinguishing system (or they only have a partial system). According to a survey carried out by the German Sawing and Wood Industry, only 23.7% of German sawmills had sprinkler systems in 2014; the majority were larger sawmills.¹⁶
- Sawmills are often situated in rural areas, which also affects the availability and effectiveness of the fire service (e.g. voluntary fire brigades or insufficient/lacking extinguishing water supply).

The following areas of a sawmill are particularly vulnerable:

- Coating plant with direct heating
- Directly fired decentralised heating systems in the production/storage areas
- Extractors
- Filters
- LPG systems
- · Film shrinking machines
- Hazardous goods warehouses
- Compressors
- Grinding equipment
- · Thermal oil systems
- Drying facilities
- Chipping plants
- Drying kilns
- Extraction and filter systems

The loss reports and press releases named the following as the most frequent causes of losses:

- Arson
- Metallic foreign objects
- Open flames (e.g. smoking)
- Activities that represent a fire hazard (e.g. welding and grinding)
- Overheated motors or hot bearings (machine parts)
- · Electrical installations and control cabinets
- Heating systems
- Self-igniting waste
- Damage to hydraulic systems

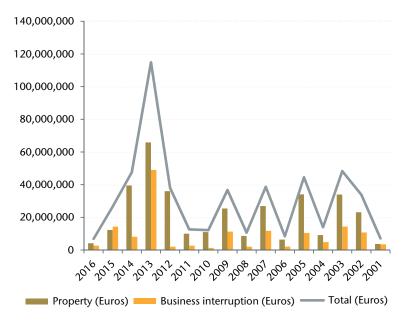
Potential fire prevention measures

As an Austrian example from the past shows, when the insurance situation deteriorated significantly as a result of the losses that occurred there, fire prevention measures can greatly reduce the fire risk of sawmills.¹⁷ Even so, sawmills often fail to take the necessary steps to prevent fires. One reason is that many sawmills were established a long time ago and the current economic situation limits investment options. Therefore, fire alarm and sprinkler systems that cover all of the areas of a building tend to be few and far between.18 Inspections of sawmills still consistently reveal that wood is stored in the free space between buildings or that fire walls are being rendered ineffective by unprotected openings.

Due to the losses in recent years, the German Association of the Sawing and Wood Industry and the GDV decided to draw up common fire prevention guidelines for sawmills in order to improve fire prevention and create awareness of solutions for cost-effective insurance cover. The guidelines are currently in the draft stage and will almost certainly be finalised in the next few months.19

Traditional fire prevention measures that are in place in other types of business are also well suited for sawmills and can greatly reduce the fire risk and the potential losses following a fire in a sawmill. Here are some examples of typical fire prevention measures:

Figure 4 – Number of sawmill fires and scale of losses between 2001 and 2016



Source: Own calculations on the basis of GDV major loss statistics

• Spatial/structural fire prevention

Fire walls, complex partition walls, partitions, storage of technical equipment in rooms with fire-rated partitions, fire-resistant building structure, restriction of storage areas or partitioning into sub-areas for storage

By dividing a sawmill into complexes or fire zones, a fire can be prevented from spreading to other areas of a sawmill. In particular, it is advisable to separate the following areas to prevent fires from spreading:

- > Log yard with cross-cut saw facility
- > Wood processing (cutting line with sorting system, planing mill)
- Drying kilns
- Finished goods warehouse and dispatch area
- Chip and dust storage (silos, hoppers)
- Energy supply and control systems
- Administration

Wherever possible, buildings and warehouses should be at least 20 metres apart. No material should be stored in this open space.

Additionally, technical rooms and areas exposed to a higher risk should be made fire-resistant at the very least. Separation to prevent the spread of fire is particularly advisable for the following:

- Storage areas for flammable liquids and materials
- > Filter rooms
- > Firing and heating systems
- > Compressor rooms
- > Electrical and hydraulic operating rooms
- > Workshops and grinding areas

In order to ensure that these areas are separated so that fire cannot spread, all openings must be fitted with adequate fire-resistant protection. The same applies to necessary openings in fire walls and complex partition walls.

The building materials and components in the building should consist of as few flammable materials as possible so as to prevent a fire from spreading rapidly through the structure. If the fire service is notified quickly enough, this configuration might enable the fire service to enter the building to extinguish an incipient fire.

Technical fire prevention

Automatic fire extinguishing and detection systems (comprehensive or partial), installation of stationary fire monitors for open-air storage areas, spark-extinguishing systems for conveyor systems, explosion prevention measures (e.g. filter systems and lightning and overvoltage protection systems).

The systems should be planned in line with the relevant technical rules and installed by qualified companies in order to ensure their functionality and effectiveness. Fire alarm systems should be installed and signal the alarm at a permanently staffed location in order to notify as quickly as possible someone who can fight the fire. Additionally, once installed, the systems should be maintained and serviced regularly.

Table 1 – Examples of potential locations for fire prevention systems²⁰

System type	Areas of application in a sawmill
Sprinklers	Production building, finished goods warehouse, hazardous goods warehouse, energy building, office, common rooms
Deluge sprinkler system	Drying kilns, sorting facilities, gluing and forming station, mechanical conveyors, filters, hoppers, silos, cyclones, hazardous goods warehouse, energy building
Water mist extinguishing systems	Drying kilns, presses, press cellar, wood processing machines, mechanical conveyors, hoppers, silos, cyclones, energy building, oil-conveying systems
Foam extinguishing systems	Press cellar, hazardous goods warehouse, oil-conveying systems, energy building
Fire monitors	Production areas, open- air storage
Spark detection and extinguishing systems	Mechanical conveyors, pneumatic extractors and conveyors
Inert gas extinguishing systems	Filters, hoppers, silos, cyclones, hazardous goods warehouse, energy building, electrical and central control rooms, server rooms
Automatic fire detection systems	In all areas

Other fire prevention measures that can be considered for a sawmill:

• Protection against arson

Examples include access control, guards, lighting and fencing of premises, CCTV and intruder alarm systems.

Explosion prevention (in extractors, filters and hoppers)

Examples include a blast-resistant structure, explosion pressure venting, explosion suppression systems and spark detection and extinguishing systems.

Operational measures

Examples include the regular maintenance and servicing of all systems, machines and fire prevention systems, annual tests of electrical lighting and power systems, the storage of flammable liquids and oils in such a way as to prevent fire, the placement of heating systems in such a way as to prevent fire, as well as circuit breakers and thermal imaging.

Organisational measures

Examples include training personnel in fire prevention and first response, the regular removal of dust and wood chips from workshops, cleanliness and tidiness,







by conveyors, which means that sawmills are often a single interconnected fire complex. This means that the maximum possible loss in a sawmill can normally be assumed to be 100% of the insured amount including any agreed extensions.

After an incurred loss, often discrepancies inevitably appear between the actual and the reported/ insured amounts, resulting in a policyholder being under-insured in certain situations. It is therefore

Damage mitigation

Examples include a business continuity plan, the backing up of important documents, alternative facilities so production can resume without delay, the diversification of available services (e.g. trade and production) and contractual agreements with friendly companies to ensure mutual support in the event of a loss.

As mentioned above, the Association of the German Sawing and Wood Industry and the GDV are currently drawing up guidelines on fire prevention in sawmills (VdS 3520). The guidelines provide information on how to prevent fires and explosions as well as their effects, especially in sawmills and in typical sawmill processing stages, such as steaming, technical drying, planing, cutting and impregnating. The guidelines also recommend organisational, technical, structural and systemspecific measures as well as preventive measures for sawmills.

Some underwriting considerations

Due to the nature of the business with its generally high fire load, the likely rapid spread of fire and the frequent lack of partitioning between warehouses and buildings, the probability for a total loss is high. The manufacturing process is increasingly automated and the individual units are connected



Preventive fire prevention

Examples include fire extinguishers, fire hose stations, an extinguishing water supply, hydrants, the fire service and regular fire drills with the local fire service.

wise to test the plausibility and sufficiency of the reported insured sums at least once per year and adjust them if necessary.

In a sawmill, the sawing area with sawing equipment and the profiling/chipping line are typically problematic bottlenecks. Experience has shown that the delivery time for important equipment, such as the sawing line, can be far in excess of 12 months; it is therefore advisable to query and regularly check the expected delivery time for the main processing equipment – e.g. the cutting line – as changes in the global market can lead to significant fluctuations. Such equipment is often only manufactured to order and based on customer specifications. The insured amount and the indemnity period for the fire business interruption insurance should reflect this.

measures to lower the risk of fire. Identified shortcomings – e.g. extinguishing systems, the extinguishing water supply or ineffective firerated partitions - should be rectified quickly and properly; the remedy of the deficiency should then be reported by the insured.

Based on current experience, in order to lower the risk of total loss in the event of a fire, the following seems essential:

- Protect buildings and systems with an automatic fire extinguishing system
- Separate units using preventative fire measures, e.g. sufficient clearance and fire walls. The distance between buildings/complexes and warehouses should be at least 20 metres.







Based on our experience, it tends to be difficult to mitigate any potential loss from business interruption unless alternative facilities with robust capacities are available or closed sawmills in the vicinity that are still ready for production can be used. Still, additional costs and extra expenses are to be expected in such a case and need to be factored into the underwriting considerations.

The active fire prevention measures in a sawmill should be critically questioned and their actual effectiveness to extinguisha fire should be examined and evaluated; inspections of sawmills continue to reveal that fire prevention systems are in place yet suffer significant defects that cast doubt on their effectiveness.

Fire protection engineers, e.g. of the insurance company, should inspect sawmills regularly, assess the risk situation on site, identify weaknesses and propose reasonable preventive and protective

Summary

Given the nature of their operations, the vulnerablility of sawmills is statistically significant in terms of the frequency and severity of fire losses. Due to their layout, they often form an interconnected fire complex; combined with their below-average fire prevention standards, a fire can be expected to cause considerable - if not total - losses.

Feedback from sawmill associations and discussions with primary insurers reveal that the problem is known; for example, it is reflected in the more restrictive underwriting policies of some insurers.

At the most essential level, sawmills should be protected by installing suitable stationary fire extinguishing systems – which will certainly pose a considerable financial challenge for the affected operators - in order to reverse the trend and significantly reduce the frequency and severity of losses.

About the Author



Leo Ronken is a Senior **Underwriting Consultant** for Gen Re's Global *Underwriting department* in Cologne. He may be reached at +49 221 9738 939 or leo.ronken@genre.com.

Further Reading

Regeln für Betriebe zum Thema Brandschutz, Deutsche Säge- und Holzindustrie Bundesverband e.V., February 2015.

"Analyse und Synthese der Wertschöpfungskette Wald und Holz in der Schweiz", Technischer Bericht "Im Auftrag des Bundesamtes für Umwelt BAFU, finanziert durch den Aktionsplan Holz", 5/2014.

Holzkurier, Prämie halbiert, Kathrin Lanz, https://www.holzkurier.com/schnittholz/2015/08/ praemie_halbiert.html.

Wood Dust in Sawmills Compilation of Industry Best Practices, 4 May 2012,

https://www.workplacesafetynorth.ca/sites/default/files/ Wood%20Dust%20in%20Sawmills%20-%20 Compilation%20of%20Industry%20Best%20Practices.pdf.

Sawdust key factor in sawmill fires in past decade, Gordon Hoekstra, Vancouver Sun, 26 July 2012,

http://www.vancouversun.com/Sawdust+factor+ sawmill+fires+past+decade/6990983/story.html.

Market report of thet German Sawmill Association: Konsolidierungsprozess in der Sägeindustrie hält an, 26 May 2015.

Press release oft he German Sawmill Association, Weniger Brandschäden: Sägeindustrie hofft auf neues Vertrauen bei Versicherern, 25 October 2016, www.saegeindustrie.de.

German Sawmill Association, Struktur der Sägeindustrie, DeSH, www.saegeindustrie.de.

German Sawmill Association, DeSH, Studie zur Nadelholzsägeindustrie – Trends und Tendenzen bis 2018, 1 June 2016, www.saegeindustrie.de.

German Sawmill Association, Leitfaden zum Thema Feuerversicherung (Risiken und Schutzmaßnahmen), 8/2015, www.saegeindustrie.de.

Endnotes

- Zahl der Sägewerke ohne Feuerversicherung steigt,
 25 October 2016, www.euwid-holz.de;
 Feuerversicherer verabschieden sich von der Sägebranche,
 22 November 2013, www.holz.fordaq.com.
- 2 GDV-Publikation zur Schadenverhütung "Brandschutz in Sägewerken", joined publication of GDV and DeSH, draft December 2017.
- 3 Bankenforum Forum für Banken und Finanzierungspartner der Sägeindustrie, Schwärzer & Partner, 16 March 2015, http://www.saegeindustrie.de/ downloads/dynamisch/5369/vortrag_ bankenforum_2015_sp_final.pdf
- 4 Faktenbuch der Säge- und Holzindustrie in Deutschland, https://www.forum-holzbau.com/ pdf_15/desh_faktenbuch_final_web.pdf sowie Döring Mantau, Sägeindustrie – Einschnitt und Sägenebenprodukte 2010, https://d-nb.info/1028965168/34.
- 5 Roadmap Holzwirtschaft 2025, DHWR; DeSH market report, 26 May 2015 and www.dhwr.de/docs/ dhwr_roadmap_holzwirtschaft_2025_web.pdf.
- 6 See endnote 3.
- 7 http://www.saegeindustrie.de/sites/branche.php.
- 8 https://www.bankaustria.at/files/Forstwirtschaft_ Holzverarbeitung.pdf and http://www.advantageaustria.org.
- 9 http://www.holz-bois.ch/startseite/branche/zahlenund-fakten.html; and http://www.forum-holzbau.com/ pdf_studien/Branchenanalyse_Schweiz.pdf?lang=de.
- 10 http://www.forum-holzbau.com/pdf_studien/ Branchenanalyse_Schweiz.pdf?lang=de; Bankenforum, see endnote 3.
- 11 Roadmap Holzwirtschaft 2025, DHWR, see endnote 5.

- 12 Sägewerkskongress, Berlin, January 2017 and http://www.rohholzverbraucher.de/sites/aktuelles_ pressemitteilungen.php?id=492.
- 13 www.saegeindustrie.de/downloads/dynamisch/5369/vortrag_bankenforum_2015_sp_final.pdf.
- 14 Basis GDV- Risikostatistik Firmen 2015 as well as own calculations.
- 15 Brandgefahren in holzverarbeitenden Betrieben, www.schadenprisma.de, 22 2/2012.
- 16 Deutsche Säge- und Holzindustrie Bundesverband e.V. Leitfaden zum Thema Feuerversicherung (Risiken und Schutzmaßnahmen), http://docplayer.org/38870500-Leitfaden-zum-thema-feuerversicherung-risiken-undschutzmassnahmen.html.
- 17 http://www.der-winzer.at/mediadaten/?+Praemien+gestiegen+&id=2500%2C1044556%2C%2C%2CY2Q9 MTM1Jmt3PXZpZXc%3D; Feuerversicherer verabschieden sich von der Sägebranche, 22 November 2013, www.holz.fordaq.com; Brandschutzmaßnahmen holzbe- und –verarbeitende Betriebe, Teil A Säge- und Hobelindustrie, Fachverband der Holzindustrie Österreichs and Versicherungsverband Österreich, Wien, 19 July 2004.
- 18 Study carried out by the German Sawmill Association, press release 25 October 2016.
- 19 GDV-Publikation zur Schadenverhütung "Brandschutz in Sägewerken", jined publication of GDV and DeSH, draft March 2017.
- 20 Minimax GmbH & Co. KG Competence Center Wood, Bad Oldesloe, https://www.minimax.com/DE/en/ downloads/14/de/; Brandschutz für Sägewerke, T & B electronic GmbH, http://tbelectronic.eu/.

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General Reinsurance AG

Theodor-Heuss-Ring 11 50668 Cologne Tel. +49 221 9738 0 Fax +49 221 9738 494

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