

The Bottom Line on Spark Detection & Fire Protection

By Ward Williams



Ole Sorensen.

“A Concerned Manager Will Be Rewarded by Peace of Mind,” says Ole Sorensen, Founder & President of Flamex, Inc.

Introduction: The Minifog® fire protection system was developed in Germany by Minimax GmbH & Co. KG. The U.S. firm Flamex®, located in Greensboro, North Carolina, has been their sales and installation partner for 30 years. Recently, Minimax acquired Flamex from its president and principal owner, Ole Sorensen. Ole is a well-known personality in the panel/forest products sector of Canada/USA and has long been an ardent participant and supporter of woodworking machinery shows in this industry. Following the above-mentioned merger, we invited Ole to share his views and expertise on the vital, in fact, indispensable, area of fighting fires before they happen.

What happens when a plant is hit by fire due to even a tiny wayward spark? The results can be costly and devastating in terms of human suffering, as well as destruction of physical property, loss of production and deterioration of market position; perhaps even forcing the company out of business with economic losses to working families and local communities.

Question: Ole, I forget how many years ago it was since I first met you, but as a frequent visitor to Northern Europe, I detect an accent that is still pretty well tinged with a Scandinavian origin. The spelling of your family name leads me to think that it might be Danish.

Answer: That's correct. I grew up in Denmark.

Q: What was the path you followed that brought you to a long career closely connected with the North American woodworking industries?

A: After graduating from high school, I joined The East Asiatic Company in Copenhagen as a management trainee. This involved a three year apprenticeship for me in the corporate accounting department. The day started with classes at the head office at 8:00 a.m. until 9:15 a.m. From 9:30 a.m. you were at work in your department until 4:45 p.m. when you went to business school from 5:20 p.m. until 9:00 p.m. On Saturdays, we were let out at 2:00 p.m. This rather demanding schedule lasted for three years. The East Asiatic company at that time was the largest Company in Scandinavia. It maintained about 175 offices and fully owned companies in more than 50 countries. The main activities were shipping, industrial enterprises, food stuff and raw

material commerce such as timber trading, primarily from their fully owned forest land on five continents. I joined the company, being well aware of the tough demands, in order to get an opportunity to see some of the world.

After completion of the training period, I had to do my National service. I served for two years in The Royal Danish Horse Guard. My training however was at the armored battalions officer training school for 18 months resulting in a commission as a lieutenant of armor. By July 1962, my service was completed and I returned to my employer.

Upon my return, I was informed that my first overseas posting would be Mombassa in Kenya.

In East Africa, our main activities were the export of hides and skins, coffee and tea, as well as, agricultural products. My assignment was the coffee department. We exported more than fifty thousand tons of green coffee beans a year to more than 25 countries. On the import side, the main products were graphic arts equipment, electrical industrial products, chemicals and any other products that supported the surge of investment during the early sixties when all the East African countries obtained independence.

All the coffee for export went through our own facility where the coffee was

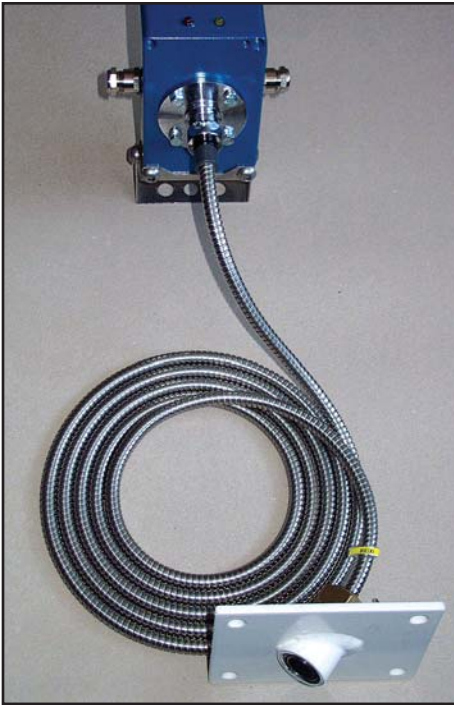
cleaned, sorted and packed for export. At this facility, we also had a roasting plant distributing roasted and ground coffee for local consumption in East Africa, as well as some export to the Arabian Gulf countries. Regrettably, my tour in East Africa came to an end in April of 1966, when I was transferred to EAC here in America, which was headquartered on Wall Street in New York City.

In New York, my main responsibilities were the development of new activities in import and export. Major emphasis was placed on helping Danish industries introduce and hopefully sell their products in North America. One of the product lines we embraced was pollution abatement and energy conservation expertise and equipment. This put us into the forest product industry where we noticed an increasing number of fires and explosions primarily in dust collection and filtration systems.

Q: How did you get a foothold in this area? And where did Flamex enter the picture?

A: The standard defense against fire and explosion at the time were sprinkler systems, and in a few places, explosion suppression systems. Both of these are after the fact, so to speak.

The presence of fine dust creates a very hazardous situation that can result in an explosion when sparks or other sources of



High Temp Fiberoptic with self-monitoring optics.

ignition are introduced. We were looking for systems that could take care of fires and sparks in the duct work before they reached the cyclones, filters or storage silos where real damage could occur. Specifically, we were looking for a system that would detect the smallest spark, moving at 5000-7000 feet per minute, and extinguish it before it could reach the collectors or the silo.

To bring us closer to the woodworking industry, we opened an office in Greensboro, North Carolina in 1973. I moved my family to the South and we have never regretted that decision. When we first came to Greensboro, we were known as Moldow Dust Control, and later EAC Engineering Products, for industries other than forest products companies.

At Ligna in 1975, we met Minimax of Germany. Minimax is the oldest fire protection company in Europe with more than 100 years of experience. Minimax is also a world leader in fire protection technology with a presence world wide in special hazards protection. At that time, they produced an ember detection system that was developed for conveyor belts handling primarily coal. After more than one year of negotiation, we convinced Minimax that an interesting market existed if they could develop a very fast acting system that could detect and extinguish a spark



Flame Detector FMX 3511 with self-monitoring optic.

in milliseconds within the confines of the ductwork.

The Flamex spark detection and extinguishing system was introduced at the IWF woodworking machinery show in Louisville in 1978. The Flamex system was awarded the most coveted "Challenger's Award". This award is given to a few companies each year in recognition of new technology. Today Flamex is serving not just the forest products industry but also any industry that handles combustible products pneumatically. Geographically we operate in Canada, USA, and Mexico on a regular basis and occasionally other countries.

Q: *I understand there have been some ownership changes.*

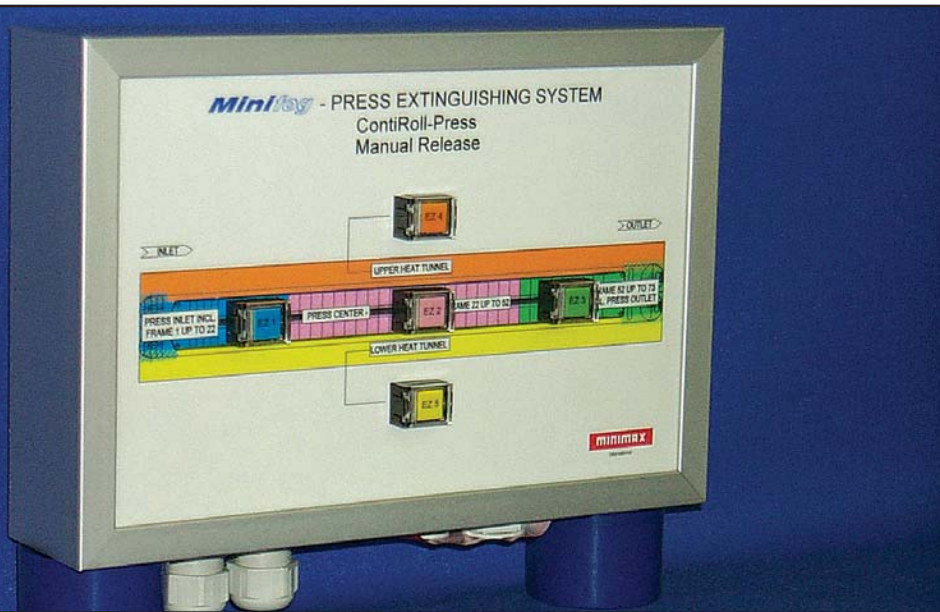
A: Yes, that is true. I started the Greensboro office for EAC in 1973. In 1992, I had the opportunity to purchase the Greensboro operation from EAC. I renamed the company Flamex in order to better identify our company with our main activity. When I turned 65 in 2004, I came to the conclusion that new owners were desirable for several reasons. First, to secure continued service to our customers without any disruptions should circumstances occur

that would force the Sorensen family to sell some or all the shares. Secondly, the Minimax ownership guarantees that the company's activities will continue and even expand. This provides protection for our great employees. I plan to stay active with the company for the next four or five years.

Q: *Are you involved in industry-wide activities in your field?*

A: Yes, most notably as a member of the committee, which reviews the NFPA 664, the Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities. The scope reads: "This standard shall establish the minimum requirements for fire and explosion prevention and protection of industrial, commercial, or institutional facilities that process wood or manufacture wood products, using wood or other cellulosic fiber as a substitute for or additive to wood fiber, and that process wood, creating wood chips, particles or dust."

NFPA is the National Fire Protection Association of Quincy, Massachusetts. NFPA issues hundreds of standards for fire risks involving all industrial occupancies



Manual release push button station at multiple locations around the press.

and activities. These are the codes that the local fire chiefs and the authorities having jurisdiction are guided by.

Q: With the proliferation of continuous presses, the panel board industry has been faced with a new challenge in fire protection. How was this met?

A: Yes that is correct; the continuous press poses some new challenges to the fire protection industry. The press is processing a number of combustible materials such as wood fiber, glues and resin. In addition, the press itself contains a large volume of hydraulic oil and heat transfer oil, the latter sometimes being close to or above its flash point. A leak in any fitting can cause an instant fire when the hot oil mixes with the ambient oxygen.

Other fire hazards are created by allowing the wood fiber, oil and grease to accumulate on all surfaces of the equipment and building structures. This dust can heat up, ignite and cause a serious incident.

FM Global has conducted tests on this fine dust build-up, and proven that as little as 1/16 of an inch of fine dust collecting on surfaces can ignite causing a small disturbance that will send more dust airborne, which will then ignite. The result may be several gradually larger explosions that can eventually blow the roof off a building.

In the past, conventional fire protection required that a staff member notice the fire, then organize a fire fighting team that would hose down the section with the fire. It has been determined that this

large volume of cold water could cause great damage to the press due to the rapid cooling which causes warping of steel and damage to electrical installations as well as, instrumentation.

Q: How extensive is your typical Flamex installation in a panel mill?

A: A modern day panel mill is built around a double-steel belted continuous press or multiple opening vertical press. The fire protection is split up in several areas. The pre-press zones are the chippers, refiners, dryers and pneumatic conveying system taking the fiber into the bins at the forming line.

These operations are at a minimum protected by spark detectors activating water spray and deluge systems. Secondary detectors can activate fast acting abort gates venting explosions to the outside and protecting downstream operations. In some cases, rate of rise temperature detectors and gas detectors are employed.

The forming lines can be protected by a combination of spark detectors, heat detectors and flame detectors. All these can activate a combination of things such as a reverse of feeding belts; water spray and deluge of bins and belts.

The protection of the press is accomplished by splitting the press up into a number of zones in order to reduce the volume of water needed. A larger continuous press could include the following zones: press inlet and seven frames; press middle; press outlet and seven frames; upper heat

tunnel; lower heat tunnel; press pit; press exhaust system as well as the “environmental system;” hot oil room; hot oil pumps; and hydraulic pump room.

In addition, we have protected after press operations such as sanding, cutting to size and other value-added applications including laminating and painting operations.

The complete protection of a board plant as described above can involve 100 separate zones of detection with hundreds of detectors, and more than 500 spray nozzles of different volumes and spray patterns. Several control panels will be required to supervise and operate all these functions. A thousand meters of pipe and several thousand meters of electrical wiring will be necessary.

The Minifog system is a dry system. After detection of a fire anywhere on the press, water will reach the most distant nozzle in 15 seconds or less. The nozzles will spray 10 or 18 liters per minute depending upon zone requirements. Due to the size of the droplet, it will penetrate the fire plume, evaporate and expand about 1500 times creating steam that will cool and smother the fire in seconds. This design greatly reduces the volume of water required, but more importantly eliminates the damage to the press due to a rapid cooling.

Q: With your knowledge of and connection with the spark detection/fire protection sector, how would you rate the position of the wood industry in fully protecting itself? And are there any serious gaps?

A: That is a very good question. In general, our proposals are well received and plants protect what they deem required. Typically, we are asked to provide a solution for the protection of areas where fires have already occurred. When we suggest other areas of manufacturing that deserve protection, the selling becomes harder. Unfortunately, I know of too many cases where our recommendations were ignored and problems occurred later. Frankly, when we recommend a specific protection scheme it is because we have seen incidents at other plants. After more than 30 years in this business, I have noticed that the more successful companies are those that protect their business well.

Q: What would be your foremost issues at Flamex in selling the protection philosophy?

or a build-up of heat from motors and damaged electrical installations.

Q: Can you mention some actual examples that indicate the extent of wood industry damage and losses incurred (including financial) prior to these modern detection systems?

A: This is very tricky for several reasons. We know that many companies carry a large self risk or deductible. Incidents below this amount are certainly not declared. Incidents above may not be declared either, unless human injury is involved. The issue here would be that the insured company is concerned their premiums will go up. In the early seventies, I saw numbers from one group of underwriters that averaged more than 25 million dollars a year paid out in fire losses. It is probably safe to assume that the losses for the entire woodworking and forest products industries would have been more than \$100 million a year.

Q: What is the difference between a class A, class B and class C fire?

A: A class fires are solid materials such as wood boards, panels, sawdust etc. B class fires are liquids such as oils, solvents and also gases. C class fires are electrical.

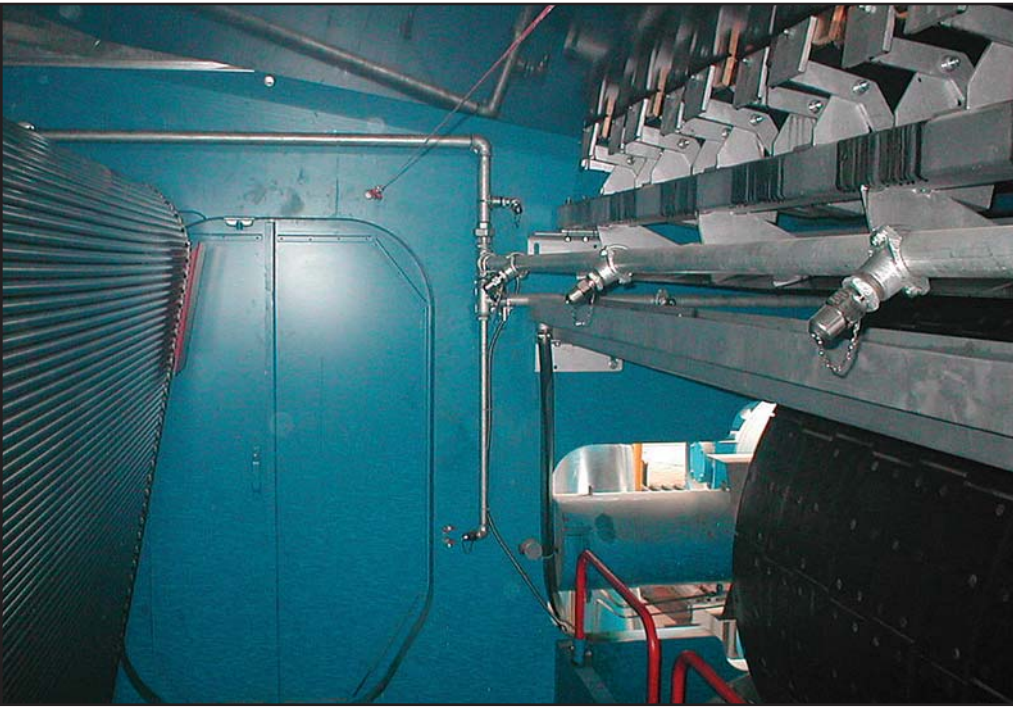
Q: What share of your business comes from the wood and wood products industry as opposed to other industrial sectors?

A: About sixty percent is in the wood and forest products industry. The remaining is across a dozen different industries and this segment is growing yearly.

Q: What's been the role of "Factory Mutual approval" in your operations?

A: The Factory Mutual approval and listing is very important to us. FM Global is a testing laboratory for several independent insurance underwriters. These underwriters demand that their customers only use equipment that is FM approved for the purpose used. So, for example, in order to get a control panel approved by the underwriter, it may be necessary for all components inside the panel to first be tested and approved by the FM Global testing laboratories.

Q: How would you rank the most-dangerous materials or situations in wood products plants from the standpoint of a potential fire



Protection of outlet chain roller return.

A: In the order of importance: protection of human lives, protection of assets, continuation of the business, and being a good corporate neighbor by safeguarding against fire and smoke damage.

Q: What is your most convincing argument to persuade mill owners to make the necessary investment for the safeguard of machinery and employees, as well as warehouses and product inventories?

A: There are many variables, but I like to point out that just the cost of the equipment to protect the press can be less than one day's output of product. Losses can be astronomical. For example, the press report on a recent composite panel plant fire assessed the damage at one hundred million dollars; then add to that the loss of their market share which may never be recovered.

Q: For how many years have you been devoted to keeping this industry flame-free? And what was your first job in this field?

A: I have been in this business for more than 30 years. One of my first jobs was a big one with a hardboard plant in the mid Atlantic region. This plant had suffered fires every week for several years and the owners were considering closing. We supplied a Flamex spark detection system in the spring of 1977. For the next two years, the Flamex system detected more

than 2000 incidents, all were successfully extinguished. A couple of years later we were honored by the local congressman who was pleased that a spark detection system had saved 650 jobs in his district. Our product was read into the Congressional Record as an example of how a bit of technology could give a huge payback.

Q: When was this technology introduced to the woodworking industry?

A: In Germany, a few trial systems were installed in 1973/1976. In the USA, the first two installations were made in 1976/77. Both of these systems were sold prior to the FM approvals.

Q: What are the main sources of sparks which are potentially dangerous in wood products manufacturing?

A: In general, most woodworking machinery can produce sparks or generate heat that could ignite wood dust, especially if the dust collection system is undersized and does not deliver a high enough capture velocity or conveying velocity.

We have seen fires from heavy sanding or abrasive planing operations, in addition to wood hogs, grinders and chippers. Other likely ignition sources can come from woodworking equipment that is improperly maintained, such as dull cutting blades causing undue friction and heat buildup; metal bits and rocks in the wood;

hazard? In other words, what conditions or scenarios should management be most worried about that should lead to an immediate corrective action?

A: Without a doubt, the number one aspect would be the people in an operation that management should be worried about; especially where they did not receive proper training. Fifty per cent of fires are caused by human error and neglect. It all comes back to the plant management. Too often, management acts “too unconcerned” and tolerates poor housekeeping, or ignores warning signs. Above all, management must have the “right people.” A concerned manager will be rewarded by peace of mind.

Q: How important is “safety awareness training?”

A: I rate it very highly, because managers cannot supervise workers all the time.

Q: Are there any further technical advances in fire protection that you would like to see applied to mills?

A: Yes indeed. We have several ideas that are being worked on at Minimax in Germany. However, I have learned the hard way not to talk about such matters until we have a product that can meet the challenge. Conducting tests by trial and error in the field can become expensive. However, should a mill operator come to us with a specific request, we will be pleased to put our best effort behind the project. As long as the mill owner understands that it might not be the “final solution” the first time around.

Q: Besides the high-output composite panel industry, there are countless numbers of other wood-processing plants throughout the world. In general, how stringent are the laws and regulations in assuring fire safety in such operations? Are you providing affordable solutions to small and family-type plants, where fires could decimate the owners' livelihood?

A: This is a very interesting question. First let us talk about the world outside Europe and North America. As is well known, a huge portion of the woodworking industry has left our shores for the Far East. In that area of the world, industrial safety compliance is not as extensive. Nevertheless, we find that a fair volume of fire protection equipment goes to that market, not because it is part of any code, but because it makes



Lower heat tunnel fine spray nozzle.



Fine spray nozzles between press frames.

good dollars and sense. We offer a very cost effective solution for such operations right down to a single zone control panel.

Q: Is there an R&D facility within Flamex?

A: No, the work in this field is performed in Europe by Minimax.

Q: How is Flamex set up to serve the North American wood industry? And overseas?

A: We work through 50 or more fire protection companies who have contracts with the plants. Immediate service is provided from North Carolina to solve any technical problems on the spot. In the developing world, improved funding has played a part, with more and more plants that must adhere to NFPA standards. But more attention needs to be paid by plant

owners to protecting their investments.

Q: When not heading out to visit mills and deliver the gospel of detecting sparks, what are your favorite leisure-time activities for recharging your batteries?

A: Playing tennis and relaxing with something good to read. I alternate between a fiction novel and a “real book”. Right now my “good” reading is *The History of the English Speaking People* by Sir Winston Churchill. I also enjoy spending time with the family and the four grandkids. I like nature and visiting the “Great Wild West”.

Conclusion: Thank you Ole for your views on helping industry to avoid tragic and costly losses. ■