

Crossties

The Magazine For Producers And Users Of Treated Wood Crossties And Related Products.

JULY/AUGUST 1999

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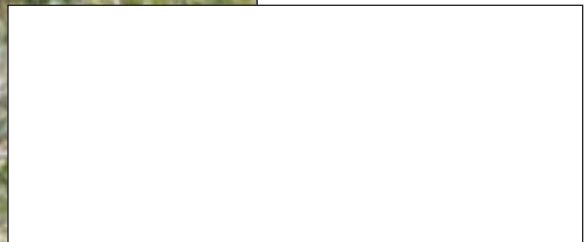
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Pole Position

Reprinted with permission from the March 6, 1999 issue of *Timber & Wood Products International*.

Editor's Note: Longtime RTA member Fern da Silva recently forwarded the following article originally published in The British Journal Timber & Wood Products International. It is reprinted here in Crossties because of its historical interest and international viewpoint on the creosote treatment of wood products. Of particular interest is the "common sense" approach wood treaters across the Atlantic have to the environmental benefits of creosote and the recycling and disposal of used wood products.

Stroll down any highway, gaze across any field and the chances are you'll be looking at the handiwork of Burt Boulton & Haywood Ltd. And, while it's true that the company has had 150 years to fill the land with its products, it's still no mean achievement.

Poles, telegraph and otherwise, are the *raison d'être* of this Newport-based (Wales) company and, although they may seem two a penny to the unpractised eye, the reality is very far from that and involves a bit of a history lesson.

"The story really started in 1838 when the railway boon was starting," recounts Joint Managing Director Alan Parks. "Henry Burt was a railway engineer who worked closely with Bethell who had patented a pressure creosoting process that we still quote today."

Burt set up his company in 1848 and was joined a couple of years later by Samuel Boulton. "They were clever engineers and good businessmen," Parks continued. "They were tar distillers and timber preservers and they produced railway sleepers in huge volumes."

"They knew that the essence of wood preservative treatment is the seasoning and drying of the timber first—if only people would get that right the future of timber would be better assured."

In the 1880s, the Boulton process was developed to address the moisture content

problem. Sleepers were placed in a pressure cylinder which was partially flooded with creosote and a vacuum was pulled. The combination of the vacuum and the heat of the creosote oil vaporizes the water. "It's quite a cruel thing to do to wood, but certain species can tolerate it," Parks said. "And, the process is still used today, mainly in the United States."

The Newport site has its first mention in the history books in 1861, when its biggest client was Brunel's baby, the Great Western Railway, affectionately known as God's Wonderful Railway. The railway networks spread far and wide with Burt Boulton & Haywood (a nephew of Burt) tagging along, and by 1866, the company had more than 150 depots and associated businesses in 10 countries.

Enter the 20th century and when the telephone network started to gather pace, and the first record of preservative treatment of telegraph poles at the Newport site was in 1902. Fifty years later, the electricity supply

industry (ESI) became more significant, and the company was creosoting at sites at Belvedere, Eling, Southampton, Newport and West Hartlepool. By 1985, the pole activity was a division of Burt Boulton (Timber) Ltd., a merchanting and timber importing business. But this was retained when Burt Boulton (Timber) was sold to Travis Perkins in 1989.

In 1994, other parts of the business were "hived out," and James Jones and Sons Ltd. bought the assets and pole business of Burt Boulton & Haywood at Newport. The company was back to one site again.

"James Jones had a pole division at Grangemouth and Leven, but we were bought as a separate legal entity, and we continued to operate as Burt Boulton & Haywood seamlessly from our previous life," Parks said. However, in the early summer of last year, James Jones sold the division in order to concentrate on its core business. Burt Boulton & Haywood was acquired for an undisclosed sum by the Finnish forest products giant, Metsaliitto. Burt Boulton & Haywood then bought James Jones' pole divisions at Grangemouth and Leven, thereby expanding to operate on three sites and doubling in

Calendar Of Events

July 15-16, 1999

Regional Railroad Liability Seminar
The Westin Providence Hotel
Providence, RI
Contact: Alice Saylor of ASLRRA,
(202) 628-4500

July 18-21, 1999

RTA Annual Crosstie Grading Seminar
Kerr-McGee Chemical Corp./
Mississippi State University
Columbus, MS/Starkville, MS
Contact: Debbie Holden,
(770) 460-5553

September 12-14, 1999

AREMA Track & Structures Conv.
Palmer House Hilton
Chicago, IL
Contact: (301) 459-8042

September 12-14

ASLRRA Convention
Marriott Marquee

New York City
Contact: Kathy Cassidy,
(202) 628-4500

Sept. 29-Oct. 1, 1999

81st Annual RTA Convention
The Buttes, A Wyndham Resort
Tempe, Ariz.
Contact: Debbie Holden,
(770) 460-5553

Sept. 22-25, 1999

NHLA Annual Convention
Sheraton Hotel & Marina
San Diego, CA
Contact: NHLA, (800) 933-0318

March 7-18, 2000

2000 AAR Annual Research Program Review and Open House
Transportation Technology Center Inc.
Pueblo, CO
Contact: Diana Oliva Maal,
(719) 584-0759

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size in the process. It now has an annual turnover of £10m.

Today, Burt Boulton & Haywood's core business remains making poles for the ESI and for British Telecom. "We also do sleepers and crossings for railway business," Parks said. "But scrape that all away and you've got to say that essentially we are wood preservers." It treats both its own timber and that of third parties and, along with its creosoting plants, operates bolt-on CCA plants. Its combined creosote and CCA treatment amounts to 50,000m³ a year.

Obviously both James Jones and Metsaliitto knew a healthy prospect when they saw it, and this was due in no small part to Burt Boulton & Haywood's daring investment program—daring because it took place in 1991, at the height of the recession when many other companies were battenning down the hatches.

The £1m upgrade of plant and equipment at the Newport site was staged over two years and was justified on the grounds that tighter environmental controls were on the horizon, along with stricter codes of practice for the operation of treatment plants. The company also wanted to develop its own quality systems.

The two pressure impregnating creosote plants are now fully computerized and both the hardware and software, providing continuous monitoring and control facilities, were custom-built. The cylinders themselves—90-foot-long, three-quarter-inch thick steel, good old-fashioned engineering, put down in the 1960s—remain unchanged. But most of the pipe work, valves and controls were upgraded. In addition, bunds were improved and certain areas roofed over.

Finland is the main supplier of poles to Burt Boulton & Haywood and, not surprisingly, Metsaliitto provides the lion's share, although it has had a long history of doing so. "We can't get the whole specification from them and we do still buy from other suppliers to get the balance of stock," Parks said. "But Metsaliitto now have ownership of that procurement process."

Planning the supply chain is a crucial aspect of the business because the poles have to be seasoned for about a year. "We season them for a long time naturally, so the action of the sun, wind and rain and the early invaders, the sap-stain fungi that can live off the contents of the cells, can act on the timber. The result is that the cells are

then empty of water, starch, sugars and resins that would inhibit the creosoting process.”

Species selection is equally important as some species don't lend themselves to the pressure impregnation process. Spruce, for example, is refractory and resists good radial penetration. Different customers have their own preferences (usually pine), but the focus is always on permeable species. Although, having said that, Burt Boulton & Haywood does operate an incising plant to puncture difficult species such as Douglas fir to ensure better creosote penetration.

Prior to treatment, the poles are fabricated—any rebates and mortises are cut and a dressing machine removes the cambium layer.

Burt Boulton & Haywood uses the Rueping process, which is almost as old as Bethell's process. The timber is placed in the cylinder and air pressure, anything up to 4 bar, is applied. That air pressure is held up for about 30 minutes and, while still holding the pressure, hot creosote, at about 100 degrees Celsius, is introduced. Pressure is now increased to anything between 10 to 14 bar, which pushes the creosote into the wood to the point where full sapwood penetration is achieved. The two cylinders are technically independent and each can accommodate up to 180 poles. Each charge takes about half a day, so the maximum output at Newport is four charges a day.

During the pressing period, a gross retention of about 230 kg of creosote per cubic meter of timber is reached. At that point, the pressure is released, the cylinder drained and a vacuum applied. The vacuum draws half of the creosote out again (to be reused) resulting in a net retention of around 115kg per cubic meter of timber.

“It's an empty cell process which leaves a lining of creosote on the cell walls,” Parks explained. “The Bethell, or full cell process, leaves the cell full of creosote and if you did that, certainly your poles would last a very long time, but they'd be black and heavy and would bleed, which no one would tolerate.

“The Rueping process is very effective and we end up with a product that can last in the

ground a lifetime. The engineers reckon their life expectancy to be around 40 or 50 years, but we know they will last 70 or 80.”

Creosote, which is distilled from the coal tar by-product of the coking ovens that provide coke for British Steel, has had its detractors of late, but it remains an astonishingly effective fungicide—and that makes creosote a telegraph pole's best friend.

“The sensible approach is to do a risk/benefit analysis and we know there are huge benefits,” Parks said. “There is certainly a case for saying that creosote in contact with the skin may sensitize it and you take sensible precautions. So if you are a linesman you should use barrier creams, wear protective clothing and attend to personal hygiene. If you behave with the sense you were born with, you're not at risk.”

A lifecycle analysis programme headed by Imperial College in 1997 also revealed creosoted wooden poles to have relatively little negative impact on the environment and, indeed, not only do the poles last many decades fulfilling their primary function, they are often reincarnated, “living” out their days as farm fencing and posting. “A second service life is very good in environmental terms,” Parks said. “In another 30 or 40 years, the gatepost will fall into the hedge and, ultimately, it and the creosote will biodegrade. So by accident I believe we've found ourselves the ideal disposal programme.”

While he wouldn't spread it on his toast in the morning, Mr. Parks is perfectly at

ease with creosote and the preservative process which, as he points out, makes good use of coal tar, a waste stream product. “Creosote is a superb substance, a safe substance with many benefits. I think mankind is lucky to have it.”

The debate may continue but creosoted poles are still well regarded by those who have cause to use them, despite the fact that their manufacture relies on what amounts to Victorian engineering. Substitutes are sought, but the ESI keeps the faith: “The creosoted pole is mechanically effective and cost-effective and its strength is well proven,” Parks said. “And therein lies its only weakness—it appears old-fashioned.”

Telecommunications is already going underground and skywards, but he believes the ESI will be using overhead lines and poles well into the future.

It's a future that owes a great deal to Burt Boulton & Haywood's illustrious past and, of course, to the people operating the business. The company won a coveted Investors in People award in 1997: “The fundamentals still apply,” Parks said. “Your business is only as good as its people. There's nothing new about management, we just put different words around it. We have implemented total quality management, but the principles of involvement, ownership and delegation aren't new. If you can encourage your people to take an interest, to contribute, give them responsibility and put your trust in them, then you can make things happen.” §

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