By Nancy DeMarco

Lwart: Better Base Oil for Brazil

SÃO PAULO STATE, Brazil — On a rainy, warm spring day in late October, the highway to the headquarters of Grupo Lwart and Lwart Lubrificantes passes gashes in the red earth, where farms in the interior have recently converted to factories. Here is Toyota's third Brazilian plant that is already producing 90,000 units a year. There, a huge Embraer airplane assembly plant. Late-model flex-fuel passenger cars whiz past lines of trucks heavy with raw materials and finished goods.

Brazil is booming, and Lwart (pronounced Lew-art) is part of that dynamic growth.

Lençóis Paulista, 300 kilometers from Brazil's 20-million-soul megalopolis of São Paulo, is home to family-owned Lwart's pulp mill, to its chemicals business, and to Lwart Lubrificantes, the group's used oil collection and rerefining business.

Lwart is poised to become Brazil's first domestic source of API Group II base oil, when its new 150,000 cubic meter per year (about 135,000 metric tons/year or 2,550 daily barrels) rerefinery opens early this year in Lençóis. By 2016, it will be joined by state-owned oil giant Petrobras, which announced plans last year to build its own 400,000 cubic meter per year virgin Group II plant at a new refinery in Rio de Janeiro.

Grupo Lwart Chief Executive Officer Carlos Renato Trecenti and Lwart Lubrificantes General Manager Thiago Luiz Trecenti welcomed *Lubes'n'Greases* to Lençóis to talk about the company's past, present and future.

All in the Family

Lwart Lubrificantes, the oldest company in Grupo Lwart's portfolio, was established in 1975 by Italian immigrant Carlos Trecenti's four sons, Luiz, Wilson, Alberto and Renato Trecenti, whose first initials gave the company its name. Lwart is 100 percent family-owned, explained Carlos Trecenti. With more than 25 individual shareholders today, four holding companies represent the four original brothers' families, each with a 25

Photo: Lwart

percent share. The current four-member board of directors consists of surviving founders Alberto and Renato Trecenti, Ademir Rorato (son-in-law of founder Luiz), and Wiverson Trecenti (son of founder Wilson).

CEO Carlos, son of founder Renato, and General Director Thiago, grandson of founder Luiz, are the only family members employed by Lwart. "We have created a good structure and good forums for the family business, and it's working," the CEO said.

Carlos Trecenti

Thiago Trecenti

The group employs 1,800 in Lençóis alone, of which about 700 work for Lwart Lubrificantes. An additional 400 employees staff Lwart Lubrificantes' used oil collection program nationwide. "Brazil has basically zero unemployment, and it's very challenging to hire, especially certain specialties like engineering, higher level maintenance and construction," Carlos Trecenti noted. "But we're seen as one of the best places to work in the area."

Investing for Group II

Lwart operates two Group I rerefineries. Lençóis, the first and largest, began operations in 1979. It uses a process based on wiped-film evaporator deasphalting and acid clay treatment to process up to 120,000 cubic meters/year of used oils. The second unit, acquired in 2008, is in Feira de Santana in Brazil's northern state of Bahia, and has 20,000 cubic meters/year of used oil capacity. It uses a process based on propane deasphalting.

At the new Group II plant, under construction next to the existing Lençóis Group I plant, two of four reactors were up by late October. "Ninety percent of the equipment was produced in Brazil, including the reactors," Thiago Trecenti pointed out. "The new plant will run 24 hours a day, except for an annual maintenance turnaround."

Lwart contracted with Chemical Engineering Partners of Irvine, Calif., for plant design and is licensing CEP's technology. CEP technology is in use at Evergreen Oil, Universal Lubricants and Heartland Oil in the United States, at PT Wirawasta Gemilang in Indonesia, and elsewhere.

Lwart's Group II plant was originally scheduled to stream by the end of 2011, but the start-up date has shifted to early this year. "Brazilian used oil is more complicated and very poor quality," Carlos Trecenti explained, "so the original design had to change. We had to include additional equipment and tanks to process the Brazilian oil. With U.S. used oil, a plant could be smaller and running by now."

"The best used oil is from car dealers. It's less contaminated," Thiago Trecenti added. "Warranties on new cars are now five years, so people have their oil changed at dealers. Fifteen years ago service stations did all the oil changes."

Because of the poor quality of the used oil that feeds it, Line One, the original Group I plant, goes down for maintenance for three or four days every 60 days. At Line Two, the new plant, every truckload of incoming used oil will be sampled and tested, and the oil will be directed to one of four tanks, depending on quality. Lwart will use a computer-controlled mixing system, pulling and blending used oil from the four segregated tanks, to assure consistent quality of feed-

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Legislation Helps

Since 1993, under Brazilian law used motor oil can only be disposed of by rerefining. The mandate has two goals: reducing dependence on imported oil and protecting the environment.

In 2005 the legislation was strengthened, spelling out that rerefining is the only legal destination for used oil. Under a new provision, lubricant producers and importers are responsible for collection and correct destination of used oil, based on their percent of the total volume sold per region, Lwart CEO Carlos Trecenti explained.

The program has succeeded. In 1993, just 12 percent of the country's collectible oil was collected. That soared to 35 percent in 2009, and the law required collection of 36 percent in 2011.

Lwart Lubrificantes is Brazil's largest collector; 300 of the country's 650 used oil collection trucks are part of Lwart's fleet.

Brazil's collectors pay for the used oil. The price per liter was about 0.25 to 0.35 Brazilian reais late last year (U.S. $0.13 to $0.19). "We believe paying for the used oil is a good idea. It provides an incentive for proper storage and inhibits illegal destinations, especially burning as fuel," said Carlos Trecenti. But enforcement is difficult, given Brazil's huge size, limited government resources, lack of environmental awareness, and the unfortunate fact that illegal destinations sometimes pay a higher price.

By 2009, rerefined base oil accounted for 17 percent of Brazil's base oil demand. Domestic production from crude accounted for 54 percent and imports for 29 percent.

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stock going into Line Two, said Engineer Ana Claudia de Oliveira Zaia.

Step by Step

The CEP process is based on vacuum distillation using wipe-film evaporation and hydrotreating; it is an acid-free method. The six-step procedure consists of pretreatment; water and light fraction removal; fuel oil fraction removal; separation of lubricant by distillation; conversion of lube distillate to base stock through hydrotreatment; and finally, splitting the base stock into desired cuts through fractionation.

The new rerefinery is built in three blocks, a front-end block, a middle utilities block, and a back-end block, Zaia continued. The carefully blended used oil goes to the first block, where caustic is added, and the light ends and water are removed. "Evaporators are the main event in block one." The oil then goes to the back-end block, where the oil passes sequentially through four reactors, each 30 meters tall with catalysts inside. "The output is Group II base oil," Zaia said.

The Group II oil then goes back to the front-end, where the fractionator is located, to produce light, medium and heavy neutral products, which then go into storage tanks for delivery to customers. Lwart's three grades will be a light 4.5 centiStoke viscosity, a medium 7.5 cSt, and a heavier 10.8 cSt, all at 40 degrees C. In the end, about 62 percent of the plant's feed will become Group II, and another 9 percent light fractions.

When construction is complete, the plant will have a total of 20,000 cubic meters of used oil storage and 8,000 cubic meters of base oil storage. Most of Lwart's sales are CIF; that is, "we sell delivered. It lowers the risk of contamination," Thiago Trecenti said.

Exploiting Synergies

Brazil's lubricant blenders are concentrated in Rio de Janeiro state, far from Lençóis Paulista. "Eighty-five percent of our base oils go to Rio de Janeiro, and the logistics are better in Rio," Thiago Trecenti said. "But the synergies in Lençóis are better."

Grupo Lwart runs a thermoelectric plant at its pulp plant, less than four kilometers from the rerefining site, making the plants completely energy independent. The asphalt flux from the rerefinery becomes one of the principal raw materials for sister company Lwart Quimica. Linde, the international industrial gas company, is building a hydrogen plant on the Lençóis site, to be completed by April. Lwart will supply energy to the Linde hydrogen plant, and it will supply hydrogen to the rerefinery. "We'll use trucks to supply hydrogen from start-up until the Linde plant is complete in the second quarter," Thiago Trecenti said.

Lwart runs its own fire department and clinic, and treats wastewater on-site in Lençóis.

"We have to train all our own staff," General Director Thiago continued, including the laboratory staff of 16. "The new base oil plant will not use the same controls as the old plant, so staff transferred to the new plant must be trained. Our training runs from January to December, by our own staff with some help from some suppliers."

Perhaps most critical to the rerefiner's success, Lwart's rerefineries are supplied by Lwart's own used oil collection system, far and away Brazil's largest. The company owns 300 trucks; 250 are used for collection throughout Brazil and 50 larger tanker trucks deliver to and from the rerefineries.

Quality's Challenge

Rerefined lubricants face a struggle for acceptance in Brazil. To date, the Trecentis concede, most of their Group I products are used in industrial applications. Customers are now demanding higher-quality base oils, however, and "we have to produce quality Group II," Carlos Trecenti said.

Customers are not demanding rerefined oil; they are demanding quality Group II, concurred Thiago Trecenti, prompting Lwart's decision to build the new plant. "Our future Group II will go to automotive lubricants."

Lwart Lubrificantes, with sales of about 220 million Brazilian reais a year (U.S. $124 million), has invested over $150 million in the new rerefinery. Financing for the project came 50 percent from Brazil's National Development Bank, 50 percent from the company's own capital.

Recognizing the need for motor oil certifications in the automotive sector, Lwart is working with a major additive company for approvals, so customers can offer API-licensed motor oils.

"Security of supply is another big advantage for our customers," said Carlos Trecenti. "We can deliver just in time."

Asked about pricing for the rerefined Group II base oils, Carlos Trecenti paused. "We're still studying pricing. Petrobras' Group I is the reference for the market, but now imported products set a higher mark. We're in the last rounds of deciding. Our price will reflect higher quality and performance."

Looking at the future, "used oil collection could become a bottleneck," Carlos Trecenti said. "We added 60 trucks in the last two years, and we're studying being more efficient with our collection centers."

Lwart's business plan calls for stepped-up investments in collection, particularly in Brazil's fast-growing northeast. And Lwart will increase capacity by 20 percent at the Bahia rerefinery in the next few years, going from 20,000 to 24,000 cubic meters per year.

Grupo Lwart is very proud of its 30-plus year record of innovation, growth and reinvestment. Indeed, Carlos and Thiago Trecenti confirm, Lwart takes very seriously its commitments to its customers and suppliers, to its employees and their communities, and to the environment. ▮