



#### Features and Benefits

Important component of retrofit design that doubled storage space & improved material handling.

**Industry Group:** Vertical Reciprocating Conveyors

#### Quote:

"We are extremely happy with the operation of the Pflow lift and we have been running it with absolutely no problems," said Roy Whitaker, Sea Ray senior process engineer in Palm Coast. "We will soon be moving from manufacturing six models to 11, so it could not have been a better choice for a capital expenditure!"

#### Boat Mold Lift

*Custom Pflow lift helps Sea Ray Boats create 9,600 sq ft of storage within existing building at Palm Coast Florida facility*



*Pflow Series F Lift measures 24ft wide x 16ft deep*

Milwaukee, Wisconsin (April 16, 2009) - Getting the most out of existing floor space is important for all manufacturers as they manage growth and the proliferation of their product lines. This need is magnified when your finished products range in length from 38 to 51 ft and in width from 12 to 15 ft. Such was the challenge facing Sea Ray Boats as they sought to upgrade the storage system for the fiberglass mold dollies in the lamination production area of their Palm Coast, Florida, manufacturing facility - all to be performed with just a minimal disruption to the standard production flow.

A custom Pflow Industries Series F material lift,

known in the industry as a vertical reciprocating conveyor (VRC), is an important component of the retrofit design that doubled the storage space and greatly improved the material handling system within an existing Sea Ray building.

Sea Ray is one of the top global brands in fresh and saltwater boating building four different classes of boats comprising 38 different models. At the Palm Coast facility, Sea Ray builds its Sport Yacht series consisting of seven different models ranging in length from 38 to 51 ft. With several different hull molds for each model, molds being moved in and out of storage is an ongoing procedure throughout the day. Previous to the storage upgrade the mold dollies were rolled outside for storage in various areas surrounding the plant. The molds were durable enough to withstand the weather; the problems were largely related to efficiency, productivity, safety and general organization.

By 2007 Craft Equipment of Tampa, a longtime Pflow partner and leading material handling company in the southeast, had been working with Sea Ray on a solution for well over a year. The plan that evolved was fairly common; build an 18 ft high, clear-span mezzanine in an existing building to store the molds. As its name suggests, a clear-span mezzanine covers an entire area of open floor space, essentially doubling the square footage within the existing area. The larger challenge was to develop a reliable, safe and effective means to regularly transport the vastly different sized molds to and from the ground floor and the mezzanine. Pflow, an expert specializing in material lifting equipment, was brought in to engineer the best lifting system for the project parameters.

The core Pflow product line features seven standard model series each of which can be customized as needed to perfectly match the specifications of a particular application. The Series F model ('F' for 'Four-Post') is the largest standard Pflow model with the greatest lifting capacity and largest carriage sizes. It was the clear choice as a starting point for the Sea Ray project. Then came the custom engineering!

Achieving the necessary 5,000 lb capacity was not a problem. Pflow had designed and built Series F lifts with 50,000 lb capacities or more. The 24 ft wide x 16 ft deep lift carriage was certainly larger than most, but it was unique because the entry point on each level required an unusually wide clearance. For loading and unloading the largest molds complete clearance of the entire 24 ft carriage width and a height of 8.5 ft was required. Such a large opening is not conducive to the standard sliding, vertical acting or swing gates typically used on VRCs. A motorized coiling steel, roll-up door and a special door frame design was required at each level along with an integrated door lift control.

But the real challenge was to build and install the lift so that it had no more than a  $\frac{1}{4}$ " deflection rather than the standard of less than  $\frac{1}{2}$ ". This means that at rest or in motion the lift would not deflect more than  $\frac{1}{4}$ ". Such a tight tolerance was necessary to provide a smooth transition on and off the lift for the wide variety of sizes, shapes and caster wheel configurations of the mold dollies. This was especially critical because in order not to waste any upper-level floor space, the lift carriage was designed so that the largest molds and their roller carts would just fit. This tolerance was also required at the ground level for a perfectly flush fit when the carriage settled into the large 14" deep reinforced concrete pit that was recessed into the building floor.

In order to minimize the deflection, the lift was engineered to a far tighter specification and tested rigorously in the Milwaukee plant before shipping. When installed in the Palm Coat facility, custom concrete foundations were embedded well into the soil to firmly support each of the four posts.

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"For Pflow this job was more involved than most

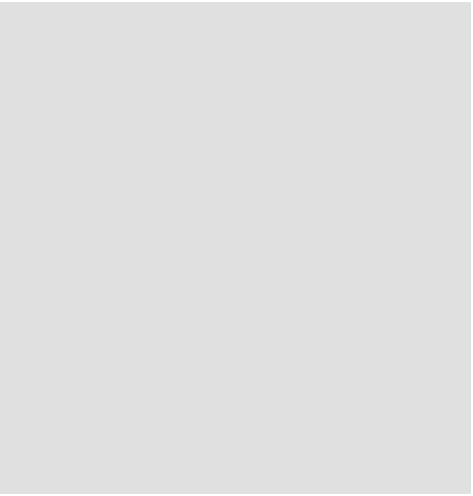
from an custom engineering perspective but certainly not beyond what we have done many times over throughout the years," said Chuck Cobb, the Pflow regional manager in the southeast. "The engineering staff at Pflow is one of our greatest assets."

As a side note, the project was additionally challenging because the Palm Coast facility is approximately two miles from the Atlantic Ocean, built on a sand-based land plot. The project required a geotechnical soil survey to determine if any foundation support measures would be required to support the weight of the mezzanine and its load. Based on the analysis, micropiles drilled 40 ft into the ground were used to support each of the 28 columns of the mezzanine. Cubic Designs of New Berlin, Wisconsin, supplied the mezzanine and collaborated with the geotechnical contractor on the unique installation process.

"It took us a while to get the project off the drawing board, but the collaboration of Pflow, Cubic Designs and Craft brought together three of the nation's best players in their respective fields," said Buddy Chadwell, the Craft sales VP in charge of the project. "The Pflow lift was a critical component because it provided the means to move such large materials. It was really the only moving part in the whole system!"

Pflow pioneered the vertical material lifting system product class over 30 years ago and has designed and built systems to lift materials from 100 lbs. to 100 tons for a diverse group of applications the core of which includes installations in manufacturing, warehousing, distribution and retail segments.

Notes: **Micropile** and **minipile** systems are excellent for underpinning, and are constructed using geotechnical techniques and conventional materials. Piles (micro or mini) are supports to stabilize buildings, bridges, highways, towers, other man-made structures, etc. The names minipile or micropile depict their sizes, i.e., 6"-12" mini, 2"-5" micro. Minipile and micropile installations are installed by using drilling and grouting technology. Micro and mini installations can also penetrate to



hundreds of feet in dept. Each of the piles can support hundreds of tons.



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