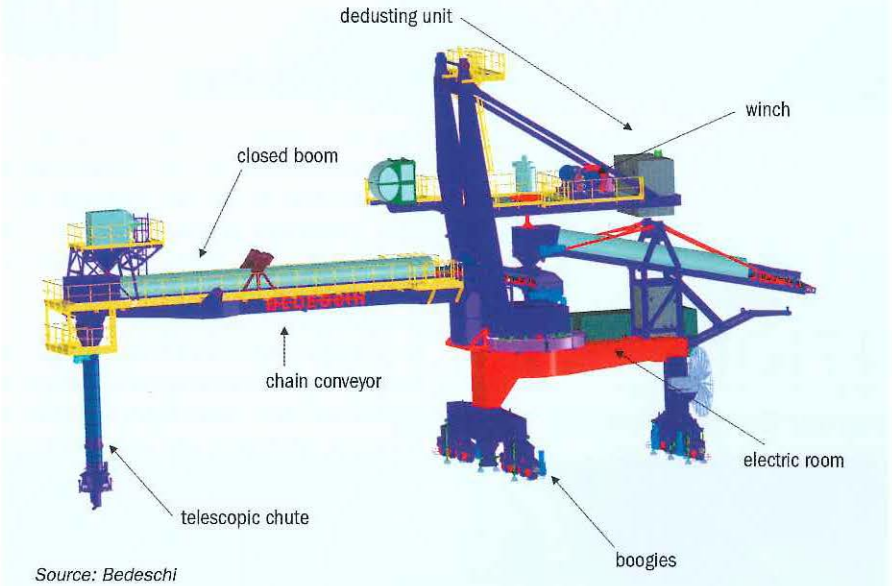
Fig 2: **Bedeschi shiploader**




*Source: Bedeschi*

loader at Brunsbuttel, Germany, as part of a turnkey project with Yara Germany to replace its existing shiploader at the port.

Bedeschi's shiploader is essentially a travelling portal fitted with four corner wheels that moves along the quay on a set of rails. A transfer chain conveyor on the upper part of the portal receives urea or other bulk fertilizers – from a tripper car fitted to the fixed gallery belt conveyor on the quay – and delivers this to the main chain conveyor installed on the boom of shiploader (Figure 2). The main chain-conveyor then transports urea along the boom to a telescopic, tilting loading chute for discharge into the ship's hold.

Shiploading is carried out using a combination of slewing, luffing-lowering and telescoping movements. Bedeschi's telescopic chute can be fitted with either a launching belt or with a loading spoon. Its design keeps dust generation and particle breakage to a minimum by reducing free fall height and the velocity of material during loading.

## Safe and innovative

UK-based **Loadtec Engineered Systems Limited** recently added a range of marine loading arms to its portfolio which includes both road and rail tanker loading arms and a wide range of other liquid handling equipment and safe access systems.

"The transfer of bulk fluids and solids from storage to transport is critical," explains Alec Keeler, Loadtec's managing director. "The point at which the product is transferred to road, rail and marine tankers creates a number of very real risks for both the integrity of the product, the operators handling it and the environment."

Keeler points out that liquid fertilizers and raw materials can be particularly difficult to handle: "In the fertilizer industry, the volumes of fresh and waste liquids that can be classified as highly dangerous is abnormally high when compared to many other industries. In particular acids, ammonia and other noxious chemicals that need to be handled with great care, are transferred on an hourly basis to provide feedstock."

Safety is a key aspect of a Carbis rail loading system being designed for CF Industries' Port Neal nitrogen complex. Carbis is Loadtec's manufacturer and distributor in America and both companies work closely to ensure the systems designed are of the highest safety standard. The Port Neal site, located on the Missouri River, Iowa, is currently undergoing a $2 billion expansion. CF Industries plans to transport powdered urea from the complex to a Gulf Coast processing plant in rail cars using a continuous loading system. Compartments in the cars are filled from overhead hoppers using a bellows system and then sealed using "coffin lid" style closures.

To add to the technical and safety challenge, trains do not stop at the complex so the loading of urea has to take place as the cars constantly roll along the track. An innovative 43m long safety cage is designed to protect operators, as the risk of falls is high, and allows the compartments to be filled quickly, safely and cleanly (Figure 3). Operators can travel the length of the cage in safety using a built-in, fully-enclosed walkway and, if necessary, gain access to the 0.8m compartment openings through a spring-shut gate. Operators wear harnesses as a further safeguard and can be lifted out of danger in an emergency using an overhead lifeline system.

Fig 3: **Carbis/Loadtec urea loading system for rail cars**


*Source: Loadtec*