The Cargoshell: ingenious collapsible replacement for the standard shipping container

By Mike Hanlon

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It's just over 50 years since the shipping container took its first trip. Though it has changed little in the subsequent half century, standardised containerisation has dramatically reduced global transportation costs and supercharged international trade. Containerisation remains a beacon of efficiency only because it exists within the obscenely inefficient, environmentally irresponsible and otherwise resistant-to-change shipping industry. Now a new collapsible composite container is being trialled which is ingeniously more efficient, lighter, cheaper, more easily trackable, more accountable in terms of its contents and more environmentally-friendly. Despite a raft of advantages, it might not go into service because ...

Comprehending the magnitude of the merchant shipping industry is a difficult task because it is so large – the world's 50,000 merchant ships account for roughly 5% of global GDP and more than 90% of the non-bulk cargo carried worldwide arrives at its destination in containers. Which is why it makes infinite sense to streamline and optimise the trade transportation process.

In the last 40 years, the amount of goods carried by merchant ships has quadrupled to 7,700 million tonnes annually, in no small part due to the efficiencies of the standardised shipping container.

Though it took several decades to evolve, the standardised intermodal (boat, train, truck) container system is one of the most important global innovations of the last century and one of the key enablers of the emerging science of logistics over the last few decades.

Despite making the world a smaller place and the world economy much bigger, the shipping container as it exists today is still far from perfect and the latest proposal for a new shipping container, the CargoShell, offers significant benefits by comparison.

The simple iron box conceived sixty years ago was born into a different world –material science was in its infancy, satellite tracking didn't exist, the world had oil to burn, carbon footprints were left by children on carpets and raising environmental concerns would most likely have attracted McCarthyist attention.

Since then, we've learned a lot about global trade and how it operates in this new era,

where containers make more than 200 million trips each year.

The concept of a collapsible container

The concept of a collapsible shipping container now makes particular sense because a large proportion of the containers being shipped into exporting countries each year are empty - **26% of all containers shipped globally each year originate from China** for instance, so most of them are returned empty at only slightly less transporting cost than their original journey when full.

Similarly, every full container, whether it has been transported by road, train or boat needs to be returned empty at several points in its eventual round-trip and it is this particular aspect of the Cargoshell which offers the greatest benefits. **The Cargoshell has the unique ability to collapse inside 30 seconds to one quarter its original size, meaning four empty Cargoshells can be transported together in the space normally required for one empty current container.**

The logistical advantages of this capability are obvious, both in transporting and storing the containers which clutter the world's docks and freight yards when empty, and the Cargoshell design is equally as applicable for 40 ft and 45 ft containers as for the 20 ft containers it is currently being demonstrated with.
The global savings offered by a collapsible container are difficult to calculate, but they are unquestionably huge. Cargoshell has done the sums based on the known patterns of traffic in its home Port of Rotterdam, and if all current steel containers were replaced by foldable Cargoshells, it would result in a reduction of 10,000 trips annually.

Rollerdoor saves access space

There are other advantages too. With benefit of 20-20 hindsight, the **Cargoshell has a roll-up door** whereas the doors of a traditional container open outward. Cargoshells can hence be placed closer together than traditional containers, because they don't need the extra space to open, further saving storage space wherever access to the container is necessary.

Composite construction weighs 25% less

The Cargoshell is **made of composite materials**, which gives it many additional advantages over the steel incumbent.

Firstly, it's 25 percent lighter than a steel container, meaning significantly less energy would be required to carry every container on their estimated 200 million annual trips.

Secondly, a Cargoshell produces only one third the amount of CO_2 at the production

stage, and repairs are far easier and more environmentally friendly too. The environmental benefits of a composite container extend far beyond just this however, as steel containers are forever being repainted to prevent corrosion and to keep them looking good. Composites don't corrode when they come in contact with air and seawater, and as the gelcoat can be coloured to the corporate colours of the owner, they also never need repainting. Composites also make good insulators, and trials are currently underway to determine what proportion of goods that currently need to be transported in temperature-controlled containers can be transported without temperature control given the insulation properties of the Cargoshell.

Quality control of contents and hygiene

Composite construction offers many other benefits over steel in that it is a low maintenance material, it doesn't corrode, it's easy to clean, internal condensation is reduced and it provides no nutrient for fungi and insects so the contents are better protected in many ways.

Tracking and monitoring cargo

Unlike steel containers, the composite Cargoshell doesn't interfere with GPS signals and transceiver-equipped Cargoshells can be remotely tracked through transport, transfer and storage, enabling the science of logistics to improve the entire process.

Indeed, electronic equipment can easily be added to a composite container which will monitor and report the condition of the Cargoshell and its contents during transport.

Container overboard

A surprisingly large percentage of containers end up in the sea each year, becoming a danger to shipping traffic and are a source of pollution when they sink to the bottom of the sea. By installing float bags in the container sidewalls, a Cargoshell gone overboard will keep floating and can be traced and retrieved via the built in gps-system.

There's only one catch

With a **price tag roughly three times that of a steel container**, convincing the Cargoshell's biggest problem is finding someone in the freight chain who is prepared to pay the extra money to replace the world's 25 million 20-foot steel containers.

The Cargoshell was invented by Dutch businessman and entrepreneur René Giesbers

Stay tuned as we watch the developments.