

Static Walking Steriliser-Future Sterilisers

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INTRODUCTION

The most common fresh fruit bunch (FFB) sterilisation system used in a palm oil mill is still the conventional horizontal type. In this system, a few cages are filled with (FFB) and pushed into each steriliser which is actually unfired pressure vessels. Steam at 3 barg is admitted to the FFB laden cages for a period of 90 minutes. The first 10 min were for de-aeration during which the air contained in the steriliser chamber is driven out during the scheduled three blow-off cycles.

In the newly invented-Static Walking Steriliser (SWS), the steriliser body remains the same. It can take on any dimension or any existing horizontal steriliser can also be used. The difference lies in the following:

1. The railway line within the steriliser is absent. It is replaced by a normal 6-inch chain conveyor to carry the FFB load, which is evenly distributed throughout the length of the steriliser.
2. The FFB is fed through a circular slot on top end of the steriliser that is fitted with a hydraulic operated door. The fruit bunches are transferred from the single hopper using another conveyor running directly above the steriliser to feed into the circular slot using a chute.
3. The distance travelled (or walking) by the conveyor within the steriliser is again only the length of the steriliser. After that, the conveyor is static or does not have to move until after the end of sterilisation process. After this, the steriliser walks the same length as the steriliser again to discharge the sterilised fruit into another conveyor that carries the bunches to the threshing machine.
4. The whole process is very simple and as the fruits are fully exposed to the steam, the cooking time can be shortened from 90 minutes to 70 minutes.
5. Oil loss in condensate is lower compared to all other systems.
6. It can last a very long time as the inner conveyor is not in continuous operation.

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7. Any existing vertical sterilisers, regardless of its size, can be modified into this system.
8. Operational cost as well as oil loss is favorable compared to any other systems in use.

STATIC WALKING STERILISER (SWS) SYSTEM DESCRIPTION

The static walking steriliser (SWS) as named (Figure 1), is revolutionary to existing horizontal steriliser. It is in particular a static pressure vessel which is equipped with integrated internal conveyor that holds the fruit bunches as it moves. A fruit conveyor which is located on top of the steriliser will pick up the FFBs from the hopper conveyor and subsequently deliver the bunches to the steriliser feed inlet controlled by a sophisticated hydraulic operated circular door that will swing to one side during loading. The conveyor inside the steriliser will move slowly to receive and distribute the bunches along its full length during bunch reception. The conveyor will stop when the FFBs reached a single opening



Figure 1. Static walking steriliser.



Figure 3. A horizontal steriliser with built-in conveyor.

at the far end of the steriliser (Figure 2) to indicate the end of sterilisation process. The de-aeration after sterilisation cycle is similar to the existing process according to number of peaks used.

SALIENT FEATURES OF STATIC WALKING STERILISER

The present invention comprises several new features as follow:

- The SWS is a horizontal steriliser, which is distinguished only by a built-in scraper bar conveyor inside as shown in Figure 3, instead of fruit cages moving on rails. Fruits are loaded from the top fruit conveyor that comes from the single hopper on a hopper apron (Figure 4).



Figure 2. A single door for feeding fresh fruit bunch (FFB) into the steriliser.



Figure 4. Fruit conveyor.

- It has the advantages of well-established horizontal steriliser as well as cage-less feature of vertical, tilting as well as spherical steriliser designs.
- SWS permits excellent heat transfer during sterilisation cycle. The fruit bunches are fully exposed to the steam.
- As fruit bunches are not subjected to vertical loading such as the bunches in cage or in the worst scenario of vertical units, the oil losses in steriliser condensate as well as empty fruit bunches (EFB) can be predicted to be significantly lower than all other systems.
- The cooking time is claimed to be less than 60 minutes due to better heat transmission as the FFBs are fully exposed to the steam. The absence of excessive

layers of bunches sitting on the bottom layers of bunches will reduce oil loss in the steriliser. Unloading of bunches also follows the same sequence as the feeding cycle, except that the sterilised bunches are discharged into another external conveyor that delivers the FFBs into the thresher feed conveyor. The process is simple; no tipper, overhead hoist, indexing system, fruit elevator or loaders involved.

More than 10 mills in Indonesia and South America have installed SWS in their palm oil mills. The system can be integrated in any conventional horizontal or vertical sterilisers of any size or capacity. Modification of the existing sterilisers can be carried out without shutting down the mill.

