



Cocoa Shipment

Cargo Monitoring & Recommendations

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Cocoa Beans Risks



A 2600 metric tons (MT) shipment of cocoa beans made the long journey from Abidjan to Hamburg and from Lagos to Amsterdam. After arrival at its destination, it was discovered that up to 40% of the cargo was damaged due to container rain and container sweat

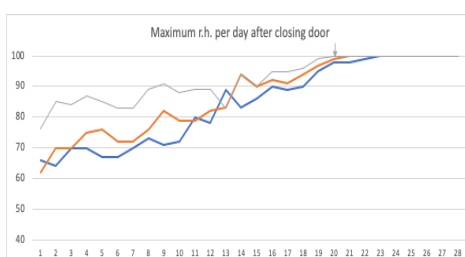
Container rain and container sweat are caused by changes in temperature, which occur when vessels pass through different climatic zones. Time and relative humidity within the container are prerequisites for the eventual occurrence of container sweat and container rain. If at any point in time the relative humidity within the container is equal to or higher than 95% there is a major risk for container rain and container sweat. Additionally, if the relative humidity within the container cycles between a level of equal to or greater than 95%, and lowers to a maximum level of 60%, and repeatedly rises to a minimum of 95% again, within a period of 24 hours, there is considerable risk of container rain.

The report is from an ongoing project of Arviem with one of its clients, provides analysis, detailed data and assessments of the risk factors that occurred on the complete transit routes for more than 100 containers from West Africa to our clients' locations in Europe. The report gathers the data and results on the container's journey from Abidjan to Germany and from Lagos to the Netherlands.

Containers of cocoa beans regularly suffer from container rain and sweat issues. Typically, this is seen and treated on arrival and when insurance claims are made. Recent changes in the insurance industry are making these claims more difficult to process. It is estimated that up to 40% of cocoa bags transported by containers are damaged by container rain or container sweat.

Arviem, using their monitoring equipment, gathered near real-time data on the container(s) locations and conditions, including moisture and internal temperatures. Working in association with all the vendors of the Client, Arviem provided all parties with new insights into the conditions experienced inside the containers during the journey, together with possible solutions to reduce future occurrence.

Based on the data provided by the Arviem monitoring and the analysis conducted by the provider of the desiccants used, it was concluded that each container from Abidjan to Hamburg suffered severe moisture stress. For this on average over 25% of bags were sorted out because of moisture content on arrival. The reasons for the high moisture stress levels were due to high moisture content of the cocoa beans on loading, the storage and packaging of the beans on loading, and the failure to intervene when moisture levels were at critical levels.



Key facts

< 100

Containers

≈ 38,500

Bags

≈ 4600

Metric Tonnes

Worth –

24m Euro

Temperature Range:

(+30) – (-10)

Total of

8600

bags sorted for sweat issues

- Shipped from Abidjan to Hamburg and from Lagos to Amsterdam

- Varying Temperature and humidity causing condensation in containers identified

- Improper desiccant configuration identified

- Real-time monitoring helped to develop appropriate protocols for packaging



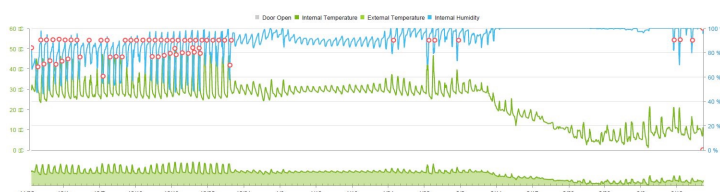
General Observations from real time monitoring



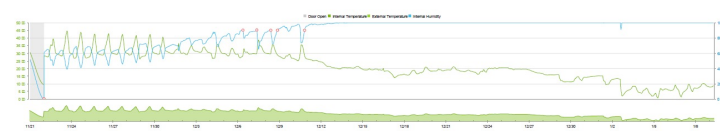
Recommendations for future shipments:

- Total transit time for the Abidjan containers was 45 days, transit to load port was 11 days;
- Total Transit time for the Nigeria containers was 80-102 days, transit time to load port was 33-57 days;
- Moisture stress in the containers from Lagos was lower compared to that in the container from Abidjan, total amount of absorbed water was significantly lower, despite the longer transit time;
- Absorption performance of current absorber product is best with 270% higher absorption than for both competitor products;
- Containers are protected with 18 pcs of absorber Blanket 1500 (= 27kg absorber weight);
- Cocoa bags stacked with reduced height over the last 4 meters of the container;
- No absorber blankets in the first 3 meters from the door;
- Spots with fungus on outer side of jute bags close to the door;
- Total moisture absorption extremely high, 86 kg, absorption rate of CD II Blanket 319%;
- 8600 bags of cocoa sorted out due to wet spots / wet damage;
- 9 days waiting time in the warehouse under full sun, max. temperature level >40 - 45°C inside container, produced a relative humidity level between 40% and 70%;
- increase of relative humidity level during next 11 days - constantly (saturation phase of absorber indicated);
- dew point hit first time at day 23, after that, relative humidity never falls back below 100% (absorber saturated).

- Continue the real-time monitoring to help packaging adaptations and to gain further information to develop appropriate protocols;
- At warehouse, measure and monitor humidity levels and work with suppliers to repack the container and replace with new desiccant when certain criteria are reached;
- Low moisture content of the entire batch of cocoa beans is vital and this should be checked and confirmed by a local surveyor;
- Avoid temperature inside the container that is higher than ambient temperature after loading;
- Change desiccant configuration if a container load is not equally distributed inside the container and a flat top surface is not created over the entire length of the container;
- Delay customs seal of material to as late as possible to allow for intervention;
- Get containers to be stored out of direct sunlight to reduce temperature volatility at both loading point and at port, where possible;
- Be aware and manage actively the amount of time for containers to move from loading point to port;
- Do not use absorber blankets if there is a high risk that container load will not be equally distributed inside the container and a flat top surface created over the entire length of the container. In such cases it is recommended to use hanging configurations of the absorber like e.g., the 6-strip on hook (36 pcs. of 6-strip 750g will equal absorber weight of 18 Blankets 1,5kg) or the Hanger 1200g (22 pcs. of Hanger 1200 will equal absorber weight of 18 Blankets 1,5kg).



Containers from Abidjan to Hamburg



Containers from Lagos to Amsterdam

Testimonial from the Client

Thanks to Arviem monitoring solution, we are able to identify the moisture levels our cargo is exposed on every transit leg and could potentially adapt the packaging for further loss prevention.



SMART INSIGHTS FOR SUPPLY CHAINS

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