



YOUNG FREIGHT FORWARDER 2020

The Coffee-drinking Automotive Nation



25. APRIL 2020

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List of Abbreviations

ABD	Ausfuhrbegleitdokument – export accompanying document
ADR	Accord européen relatif au transport international des marchandises dangereuses par route ((European Agreement Concerning the international Carriage of Dangerous Goods)
ATLAS	Automatisiertes Tarif- und Lokales Zoll-Abwicklungs-System (automated customs system)
AWB	Airwaybill
B/L	Bill of Lading
B2B AWB	Back-to-Back Airwaybill
CR	Car rack
Cbm	Cubic meters
DG	Dangerous Goods
DHL GF	DHL Global Forwarding
EORI Nr.	Economic Operator’s Registration and Identification Number
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
HGB	Handelsgesetzbuch – commercial code in Germany
HS Code	Harmonized Commodity Description and Coding System
IATA	International Air Transport Association

IHK	Industrie- und Handelskammer – chamber of commerce
POD	Port of Destination
POL	Port of Loading
SOLAS	Safety of Life at Sea
SDR	Special Drawing Rights
TEU	Twenty Foot Equivalent Unit
THC	Terminal Handling Charge
ULD	Unit Load Device
UN	United Nations

1 Introduction

Ranking behind the automotive and retail sectors, the logistics sector is the third largest in Germany with more than three million employees (see Appendix A). On the one hand, highly efficient logistics structures ensure that it is still worthwhile for the companies to produce in Germany and to export the goods to worldwide destinations (BVL – Bundesvereinigung Logistik e.V. Bremen, 2020). On the other hand, the import of goods is important, as many needed goods are not produced within the country (BGA – Bundesverband Großhandel, Außenhandel, Dienstleistungen e.V., 2014).

One important import good is coffee. Coffee is mainly grown in South America. In Bremen, Germany, specialized freight forwarders import and store green coffee from countries like Peru in their bonded warehouses. As coffee is a very sensitive and exchange traded good, many things have to be organized before, during and after the import. From the export perspective the most important good is the car (Statista, 2020). For special quality tests, German car manufacturers like BMW, Audi, VW and Daimler challenge their cars in one of the hottest places in the world – the desert (Grundhoff, 2010). One German car manufacturer decides to run these performance tests with 32 cars in the salt desert of Uyuni, Bolivia. This is a huge and time sensitive project, therefore all expertise by the assigned freight forwarder is needed.

In this dissertation I accompany these two key important goods for the German industry on their way from and to Germany. The focus lays on creating the best possible solution to meet the customer requirements. This particularly includes dealing with challenges. Freight forwarders take a central role in their client's supply chain and are a key factor for a successful transport procedure. The thesis aims to show the influences, importance and differences of professional freight forwarding services.

2 Import of green coffee

Coffee is globally one of the most important handling goods. In 2018, a German person in average consumed 164 liters of coffee. To serve the demand on the German market, companies imported 219,814 tons of green coffee that year (Deutscher Kaffeeverband, n.d.). Berthold Vollers GmbH is one big player in terms of importing coffee to Germany. One transport of the Bremen-based company is analyzed in the following chapter.

2.1 Customer order

41,440 kilos of green coffee had to be transported from Paita, Peru to Bremen, Germany. For this shipment a multimodal transport was required, therefore the Multimodal Transport Operator Berthold Vollers GmbH, specialized on coffee transports, took control. I was allowed to work with the responsible import team and reported the results. The German customer sent us the customer order and the planning process started.

2.2 Cargo Details and Dimensions

- Green coffee in loose filling
- Cargo weight: 41,440 kg
- Equipment: Two 20' container with an inlet
- Value of goods: 110,000 USD
- Terms of sale: For the presented transport, we had the Incoterm FOB. This means that the German customer (consignee) holds the costs and the risks from

the moment the cargo is loaded on board of a vessel in Peru until the cargo arrives at its destination.

2.3 Key Requirements

- Convey a suitable vessel for the cargo
- On-carriage of the coffee to the warehouse in Bremen
- After the arrival in Bremen send three samples of the coffee to the customer for quality checks
- Store the coffee for an undefined period
- Organizing the final transport to the final buyer
- Do final customs clearance after removing stock from the warehouse
- Declare the coffee at the customs as organic certified goods

2.4 Mode of Transport

80% of the globally transported coffee is shipped as loose filling in containers, the rest is loaded in bags (Deutscher Kaffeeverband, n.d.), but also stuffed in containers. Transporting the coffee in loose filling is more efficient than transporting it in bags. One TEU can be loaded with approx. 300 bags á 60 kilos, in total 18,000 kilos. If loose filling is used, the payload is approx. 21,600 kilos. We recommend shipping with loose fillings whenever possible to use available space the most efficiently.

For both the pre- and on-carriage a truck with a trailer was used. In Peru the infrastructure for taking the train is not given and the route in Germany was too short that taking the train or a barge is payed off. Consequently, for cost and time efficiency

reasons we chose the truck as a transport device in Germany. We always use 20' containers. On the German streets the allowed maximum weight is 40 tons (including container weight and truck). A 40' container would have a capacity for green coffee of 42,000 tons. Therefore, we could not use the container capacity very efficiently. Furthermore, in Bremen there are no tipper chassis for 40' container and we need them for unloading the coffee.

Generally, for the main part of coffee transports, the sea transport, a cargo vessel is used, as the amount of globally transported coffee is too high to use aircrafts. In this case, there is no time pressure and consequently no need to think about another option. A weekly service of the carriers between Peru and Germany ensures a constant exchange of goods.

2.5 Insurance

According to "Handelsgesetzbuch" (HGB) which is aligned to the Hague Visby Rules, the liability of a carrier for an international sea transport is two SDR per kg gross weight (for loose filling), or, if it is lower, the maximum value of the goods (Bundesverband Spedition und Logistik e.V., 2013).

$$2 \times 1.2659 \times 41,440 \text{ kg} = 104,918$$

$$110,000 \text{ USD} - 104,918 \text{ USD} = 5,082 \text{ USD liability gap}$$

For this relatively small liability gap we could not offer a rewarding transport insurance, as for the on-carriage the insurance gap did not even exist (8.33 SDR/kg gross kg). Our customer organized an insurance separately also covering missing revenues in case of loss or damage of the containers.

2.6 Process

2.6.1 Arranging the shipment

For this transport, the Incoterm was FOB, so we were not responsible for the pre-carriage. But we as the freight forwarder were responsible for booking the vessel in behalf of our customer. The shipper asked us to take a vessel from Paita, because this port in Peru is the most pleasant option for the shipper. The dedicated POD was Hamburg (116km to Bremen). Although Bremerhaven is the closest to Bremen (66km), the rates to Hamburg are much better. Hamburg is the most common German port for LATAM trade lane and Bremerhaven is not a direct-called port on the vessel's schedules. Ocean rates would be higher as the containers were transloaded in Hamburg or another European main port and afterwards shipped on a feeder vessel to Bremerhaven. But we decided to book the on-carriage to Bremen via the carrier, as this was cheaper than using our own trucks.

We worked with a partner in Switzerland who bundles volumes from different customers in order to get good rates for the ocean-transport. We told our partner that we needed two 20' containers from Peru to Germany and we got an offer with a reference for a vessel of Hamburg Süd. As we always work with local agents who know the exact regulations in their countries we told our agent in Peru which vessel to book and gave him the reference under which he could place the booking based on the rates negotiated by our partner in Switzerland. In case something goes wrong it is always easier to have a contact person on-site in Peru.

2.6.2 Origin Country Process

Our agent gave all necessary shipping information (Vessel name, ETD, closings etc.) to the supplier. The supplier organized the pre-carriage to the port. To protect the coffee from external influences the containers were equipped with a plastic inlet before the coffee was loaded. After loading the containers in Peru, they were sealed in order to make it easier for the customs to monitor the goods (e.g. it is possible to see if somebody opened the container). The seal numbers were recorded on the Bill of Lading, the maritime freight contract.

As the Incoterm was FOB, the shipper needed to arrange the export customs declaration and the weighing of the containers. The gross weight of a loaded container needs to be verified before loading. This is due to the SOLAS rules, published by the IMO, International Maritime Organization (IMO, n.d.).

2.6.4 Sea transport and documentation

The containers were loaded on the vessel. The transit time to Hamburg was 28 days. The carrier gave three Original Bill of Ladings to its contractual partner, our agent, who passed them to the supplier. Afterwards the supplier sent the duly endorsed documents to our customer.

Before the cargo arrived in Germany our customer provided us the following documents:

- 2/3 Original Master Bill of Lading (including the name of the shipper and consignee, vessel, POL and POD, quantity and kind of goods, gross weight, volume, seal number, see Appendix C)

→ This document is needed to get the container from the carrier as the Original B/L represents the cargo. In case the documents would get lost during the transport the supplier kept one original document in Peru.

Required documents for customs clearance:

- Organic certificate: document which proves that the coffee is certified as organic product (see Appendix D)
- Commercial invoice (including the name and address of the shipper/seller and the consignee/buyer, description and quantity of the goods, HS code, value and terms of sale)
- Packing list (including information like marks and numbers of the goods, net and gross weight, volume and the name of the shipper)

Before the coffee arrived in Germany we did a pre-registration at the customs where we got a first reference for our cargo for further treatments. Furthermore, the customs told us that they wanted to do an X-ray control and we forwarded this information to Hamburg Süd, since they organized the transport to Bremen according to the B/L. After the vessel berthed at Hamburg, the containers were unloaded. The containers needed to pass the X-ray control before they could leave the port. This is to prevent drug smuggling and to ensure correct customs declaration. As no drugs were found, Hamburg Süd could truck the containers to Roland, the aligned container depot in Bremen.

2.6.5 Country of destination process

We as the freight forwarder submit the Master B/L in order to get the released containers. Berthold Vollers has 29 own trucks and all of them have the newest emission class. Special tipper chassis were needed for unloading the coffee (see Appendix B). The need of tipper chassis was the reason why Hamburg Süd did not transport the containers to the warehouse of Vollers. The containers were transloaded to our trucks and then transported to our warehouse.

Berthold Vollers is a registered authorized consignee and certified as Authorized Economic Operator (AEO). Thus, it was possible to easily transport the coffee via a so-called "T1 Versandverfahren" which we requested at the customs. This means that Berthold Vollers was allowed to transport the coffee to its warehouse, break the high security seal and open the containers without clearing customs, so the taxes had not to be paid immediately. The final customs clearance is explained in chapter 2.8. The "T1 document" ensured that the coffee was under customs supervision. Our containers were opened directly at the warehouse of the company after checking the seals.

2.6.6 Storage process

There are people at Berthold Vollers called "Musterzieher". These people do the first check of the coffee. They checked the coffee on the following criteria:

- The smell
- If there is condensation water in the container
- If there is living infestation (e.g. by beetles)

If everything seems okay these people pierce the inlet carefully in order to take three samples of the coffee. Sometimes special equipment is used to take coffee from the

middle of the container, as the small samples of 500 grams represent 21 tons of coffee. In this case, everything was fine and the “Musterzieher” sent the samples to our customer via courier. Within 24 hours, we received the answer that the quality of the coffee met the expectations and we could stock the coffee in the bonded warehouse. The “T1 document” was closed and the cargo was transferred to a customs warehousing procedure. Bonded warehouses are used for storage of non-union products with the advantage that import duties do not have to be paid until it is clear that the cargo stays in Germany, Another advantage is that political measures like presenting import licenses are not applicable (Zoll, n.d.). The goods are under supervision of the customs but in case the coffee is sold to a foreign country, no taxes need to be paid in Germany. The price of coffee is set on the stock exchange, therefore many importers in Germany buy the coffee when the price is low without having a customer already.

For green coffee, there is a specific silo storage at Berthold Vollers with a capacity of 40,000 tons. The silo is divided in several cells with a capacity between 25 tons and 300 tons. The coffee mentioned on one Bill of Lading is stored in one cell. For our shipment a cell with a capacity of 45 tons was used. For unloading the coffee, the trucks drove on a special unloading zone. There, the coffee was tilted (with the tripper chassis) through a grid on the ground into a conveyor system (see Appendix E). Vibrating screens and magnet clean the coffee while transporting it upward to the respective silo.

2.7 Risks

Several things need to be considered while planning a transport of coffee. In some countries, the infrastructure is not good enough for taking a container as a device for pre-carriage, as the streets cannot stand the weight of a full container. If that is the case, the coffee is packed in bags and transported in smaller vans to the port where the bags are stuffed in the container. This has to be checked before planning the transport. Another risk is that the carrier releases a container for the transport, which was used for chemicals, or other goods with a strong smell. This smell can influence the whole delivery, as coffee is a very sensitive good. The shipper needs to check the container conditions before loading.

The general risk during a transport that can occur is damaging or losing the goods but an insurance company can cover this risk. After unloading the container from the vessel one risk is that drugs can be found within the container at the X-ray station of the customs. Unfortunately, that happens regularly when importing coffee (Sprengel, 2018). This causes a long and expensive investigation process and the goods cannot be transported any further. This risk can hardly be minimized from our side.

If the quality of the coffee is not sufficient, the consignee and the shipper need to clarify if contractual obligations were not fulfilled and if a new shipment has to be sent.

2.8 Customs Clearance

After a month of storage, the customer needed the green coffee because he sold all of it to a German customer in Hamburg and wanted to get it out of the warehouse. As the coffee stayed in Germany, we had to do the customs clearance. For Import Customs

Clearance it is essential that the consignee has an EORI number. The EORI number serves for identification of the economic operator, here the importer. It is entered via ATLAS, the customs IT system, along with the other information about the goods mentioned in the documents. We arranged customs clearance for our customer. For this coffee it was really important to declare it as organic certified with the special document, otherwise it would not be possible to sell it as organic coffee. Since everything was okay and no customs officer wanted to inspect the coffee, a tax assessment was electronically sent to the declarant. For caffeinated green coffee no customs need to be paid in Germany (Zoll, n.d.), only the import-turnover tax. After paying the taxes the coffee became a union product.

2.9 Costs

The costs for a transport like this depend on the current rates of carriers. Except for the storage costs the following table represents the organized transport:

Type	Currency	Costs
Ocean Freight (to Bremen)	EUR	2 x 730 = 1,460
Bunker Adjustment Factor	EUR	2 x 277 = 554
THC Hamburg	EUR	2 x 245 = 490
ISPS	EUR	2 x 17 = 34
Release Fee / B/L	EUR	2 x 25 = 50
Handling Fee	EUR	50
On-Carriage	EUR	2 x 150 = 300
Storage incl. Handling	EUR	Depends on the duration of storage and size of the silo
Customs Clearance	EUR	85
Final Transport to Hamburg	EUR	2 x 310 = 620

Figure 1: Costs of the coffee transport (own illustration)

2.10 Completing the order

For transporting the coffee to its final destination, we ordered two trucks that we led to a loading station. The customer wanted us to pack the coffee in big bags with a capacity of 500kg each.

The coffee fell through a flap from the silo to a conveyor belt. The belt transported the green coffee to some kind of snorkels that blew the coffee into the big bags. The bags are handled with a forklift (see Appendix F). The trucks transported the coffee to the address the customer gave us and the order was completed.

The order included much more than only organizing the transport of coffee which shows how varied the tasks of a freight forwarder can be. Value-added services like sending samples and silo storage can be the decisive reason for a customer to choose freight forwarders like Berthold Vollers. The specialization in a few specific goods lead to a great knowledge in the respective field.

3 Export of Cars

The car is Germany's most important export good. In 2019, 3,568,135 cars were exported (Ahlsweide, 2020), which results in a total value of 223,0 billion euros (Statistisches Bundesamt, 2020). To keep or even increase the amount of cars, German car manufacturers need to produce high quality products in order to serve the demand all over the world. To prepare their cars for any possible situation, manufacturers ask freight forwarders like DHL GF to transport the cars temporarily to different climate areas in the world in order to perform quality tests.

3.1 Customer Order

In this case, a German car manufacturer nominated DHL GF to organize the transport of 32 cars from Hildesheim, Germany, to the salt desert "Salar de Uyuni", Bolivia. Thanks to a friend I was allowed to work with a project team member of DHL GF in Germany. As the cars were only exported for performance tests, it was clear that all cars will return to Germany. The cars stayed less than six weeks in Bolivia and they went back to our German customer in Hildesheim afterwards. Our temporary importer in Bolivia was a branch of our German customer in Bolivia.

3.2 Cargo Details and Dimensions

- 32 cars plus equipment
- Cargo weight: 51,217 kg
- Volume: 465 cbm

- Equipment:
 - 14 x 20ft pallets
 - 8 x 16ft pallets
 - 4 x CR (see Appendix G)
 - 6 x Lower Deck (LD) pallets (for cars with smaller measurements)
 - 2 ULD's for equipment
- Value of goods: 768,000 USD
- Incoterm: DAP Uyuni
- Dangerous Goods Classification:
 - UN3166, Vehicle, flammable liquid powered, Class 9 (IATA, 2015)
 - UN1203, Gasoline or petrol or motor spirit, flammable liquid, Class 3 (United Nations, 2008) → the equipment contains petrol, as some cars need a specific one and this is not available in Bolivia

3.3 Key Requirements

The project was really challenging, as we had to fulfill many requirements:

- Time sensitivity: performance tests between 27.10.2019 and 15.11.2019
- Cargo Readiness Date: week 41/42 in 2019, starting the 7th of October
- Latest delivery in Uyuni: 25th of October
- Dangerous goods declaration
- Customs provisions: temporarily export to Bolivia less than six weeks
- Car trucks needed in South America as equipment for transporting the cars
- Return the cars to Germany

- Final list of transported cars is shared ten days before departure → flexible reaction needed
- Delivery deadline in Germany: 2nd of December 2019

3.4 Mode of Transport

Our first thought weeks before starting the transport was to send the cars via container vessel to Arica, Chile, and truck them to Uyuni, as this was the cheapest and the less demanding solution. However, when we got the final cargo readiness date we decided for airfreight because the time we had for the transport was too short. Since the amount of cars was quite high, we decided to charter a Boeing 747 – 400F (see Appendix H), in which we could load 22 cars (for planning details see Appendix I) and the equipment. Due to national pollution restrictions, not all cargo aircrafts are allowed to land in Germany. If we wanted to take an Antonov we would probably have to truck our cars to France first. That is neither cost effective, nor time efficient. The remaining ten cars were sent as general cargo with another cargo aircraft via general freighter service, as this was cheaper than chartering a second aircraft for ten cars.

The pre- and on-carriage was done by special car trucks, as trucks can react more flexible to time schedules compared to the train. Arrived in South America we also needed to carry on transporting the cars to Uyuni immediately, therefore we chose for trucks here as well. We wanted to avoid unnecessary handling with the cars, so the transport to the nearest train station and later from the train station to the final destination were not an option. In addition, inflexible time schedules and a bad infrastructure in Bolivia for cargo trains encouraged our trucking plans.

3.5 Insurance

For global car manufactures, it is usual to have global insurances that cover all possible damages and losses, also during transports. In this case, our customer was already insured, but in case a customer is not DHL offers this service with an insurance rate of 0.4% on the value of the goods plus 10% anticipated profit (if needed).

3.6 Process

3.6.1 Arranging the Shipment

For the flight we needed to check where it is possible for a Boeing 747 to start. We chose Leipzig as the POL because there are fewer restrictions for cargo aircrafts than in other cities (noise and pollution). For the decision regarding the POD we worked together with DHL in Santiago de Chile as they functioned as our local agent for this shipment. Together we decided for Antofagasta, Chile, as the POD. La Paz in Bolivia is closer to Uyuni, but the airport is almost 4000m above sea level and it is not possible for aircrafts that size to land. At the airport Viru Viru, Santa Cruz, landing is possible but the distance to Uyuni is much longer than from Antofagasta. From Antofagasta DHL Santiago de Chile arranged trucks to Uyuni.

Generally, there are not many freighter services from Germany to Bolivia. Due to the schedule and the rates, we decided to book the remaining ten cars from Frankfurt in Germany to Santiago de Chile and truck them from there to Uyuni.

We arranged the transports to the airport with contracting parties. The usual capacity for a car transport is eight cars per truck (see Appendix J). For our transport that meant

four trucks from Hildesheim to Leipzig (three used for cars and one semitrailer used for the equipment) and two car trucks to Frankfurt.

We knew that the quality of trucks in South America is not comparable to the trucks we have in Germany, therefore DHL in Chile organized the on-carriages directly after deciding for a flight date in order to clarify the requirements with the trucking company.

3.6.2 Origin Country Process and Documentation

We aligned with the customer that they are responsible for loading the cars onto the trailers, which meant that an employee drove the cars onto the trailer and secured them.

In case of Dangerous Goods transports, the transport company has to make sure that the labels on the truck are correct, the truck driver has the needed license and the relevant equipment must be in the truck. The shipper must give the information about the Dangerous Goods, as this party is the only one who exactly knows what the goods consist of. According to ADR UN3166 has not to be marked as Dangerous Goods on the streets (UN 3166 Fahrzeug mit Antrieb durch entzündbare Flüssigkeit, n.d.). The transport of the petrol (part of the equipment) has to be marked as in Appendix K.

The shipper issued the Dangerous Goods Documents for all of the goods, as also UN 3166 has to be marked as DG in aircrafts. So, for the flight the documents were necessary.

Furthermore, the shipper needed to prepare the following documents:

- Pro-forma invoice including the words:

“Temporary importation...

for fair/exhibition...

of professional equipment...

of commercial samples...”

“No commercial value - only for customs purposes” (IHK Stuttgart, n.d.)
- Packing list including all marks and numbers of the cars, net and gross weight, volume and the name of the shipper)
- ABD – export accompanying document for declaring temporary export

3.6.3 Customs Clearance

Bolivia does not accept the Carnet ATA, a customs permit document for temporary admission of goods, therefore we needed to do the standard export procedures. We declared our goods for temporary export at the airport in Germany (except the petrol, this was planned to be consumed in Bolivia) by means of ATLAS and the relevant documents issued by our customer. Through this declaration it was possible to reimport the goods free of charge (no taxes).

Our DHL colleagues in Chile worked together with local customs agents in Bolivia. Chile and Bolivia are associated members of Mercosur, a regional association of South American countries that enhance economic cooperation. One agreement is a common customs union (Bundesministerium für wirtschaftliche Zusammenarbeit und

Entwicklung - B.B.F.W.Z.U., 2017). This customs union allowed us to use Chile as a transit country for our cars without paying taxes there.

After the arrival in Chile our cars were transported to Bolivia with a customs document. This document was closed when the cars reached the Bolivian border. The agency recommended that the Bolivian branch of our German customer should function as the official importer. For companies with registered office in Bolivia it is possible to apply for a bank guarantee for the suspended taxes. This guarantee is needed for the Bolivian customs, as with this guarantee it is not necessary to pay the taxes (taxes for cars with a value of 768,000 USD). This is the only reason why our German customer did not choose DDP as the Incoterm. We needed a company based in Bolivia in order to have a smooth processing. Only a fee of 1% of the good's value when it crosses the border needed to be paid to the Bolivian customs as a fee. After the temporary export the Bolivian branch offset the costs against the German branch, but that was an internal process.

3.6.4 Handling at the airport

The cars and the equipment were delivered at the warehouse of the airport. The truck drivers were qualified for unloading the truck (driving the cars). After the handover of the documents, including DG documentation, and the control of the "Car Check Sheet" the airline staff prepared the cargo for the flight. In this case the cars and equipment were loaded and secured on the respective ULD's. The ULD's belong to the airline and have to be booked in advance. Preparing the cargo for the flight is called "build up process". For our chartered flight these services are all inclusive. For our remaining ten cars from Frankfurt these services needed to be requested and booked (all-in-rate).

After preparing the goods for the aircraft they were loaded via the roller system of the aircraft. For the staff it is important to know what kind of Dangerous Goods we have in order to handle the cargo carefully.

3.6.5 Flight and Documentation

An employee of DHL accompanied the cars in the chartered aircraft to their destination in order to have a smooth processing. The flight (including layover) took about 18 hours. For this flight one Back-to-Back (b2b) Airwaybill set was created. A B2B AWB set consists of a House AWB and a Master AWB. In the House AWB the shipper in Germany and the importer were entered. The Master AWB contained DHL GF Hamburg as the shipper and DHL GF Santiago de Chile as consignee, so it is easier for DHL to receive the cargo in Chile for the on-carriage. DHL is IATA Agent; therefore the company is allowed to create AWB's in behalf of the real carrier.

For the ten cars from Frankfurt to Santiago de Chile also two AWB's were created:

- a House AWB including the name of the shipper and consignee, airports of departure and destination, quantity and kind of goods, volume, gross weight etc.
- a Master AWB issued by the Airline once for every consolidated shipment including DHL GF Hamburg as shipper and DHL GF Santiago de Chile as consignee.

3.6.6 Destination Country Process

The processes at destination were the same as for the airport of departure but vice versa. The airline unloaded the aircraft and the staff started the "break down" process,

so the cars and the equipment were unloaded from the ULD's (for the cars from the charter flight as well as for the consolidated shipment). In Chile, the cars were also loaded on a truck with a capacity for eight cars. The equipment was loaded separately. From Antofagasta/Santiago de Chile the cargo was transported to Uyuni.

3.7 Costs

The following table illustrates the most important cost factors for this transport:

Type	Currency	Amount	
Pre Carriage Germany	EUR	9,600.00	
Chartering the aircraft including two pilots and the handling charges	EUR	700,000.00	
Airfreight 10x 16ft palette with max. 3000kg	EUR	197,500.00	
DG Fee	EUR	2,244.00	(32 + 1) x 68
Special Supervision DHL Airport Antofagasta	EUR	1,189.00	
Trucking Antofagasta/Uyuni (22 cars + 2 ULD's)	EUR	9,000.00	350 per car (min. rate 2270 per truck) 22 x 350 + 1,300 (2 ULD's)
Trucking SCL/Uyuni (10 cars)	EUR	9,560.00	710 per car (min. rate 4780 per truck) 2x4780
Customs	EUR	Ca. 16,270	1% of cargo value at border
TOTAL (one way)	EUR	945,363	

Figure 2: Project freight costs (own illustration)

3.8 Completing the project

After performing the quality tests, the cars and the remaining equipment were brought back to Germany. We had less equipment, as most of the petrol was consumed during the tests, but apart from that we imported the cargo we had exported weeks before. By means of the vehicle number the customs were able to control the correct reimport of the cars. This was important in order to pay no taxes. The whole project ended with the return of the last cars on 19.11.2019. The following illustration summarizes roughly the transport procedure of the project:

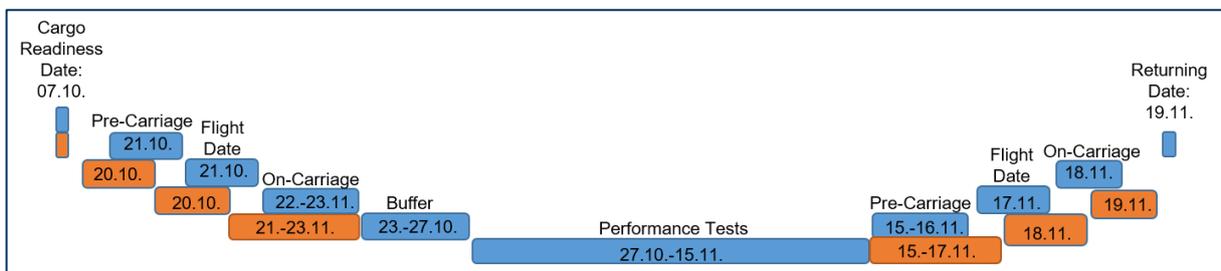


Figure 3: Transport procedure of the export project (own illustration)

Freight forwarders like DHL offer a wide range of services and an international network which allows to apply for huge projects like this. The challenge here was the amount of cars in combination with a short project duration. Furthermore, the nomination of DHL was also depending on the offered costs, so there was not much scope in terms of costs, neither for the customs nor for the transport itself. Everything had to work as it was planned weeks in advance.

4 Conclusion

These two examples of import and export are perfect to show how different the requirements for a freight forwarder can be. For some the transport itself represents the challenge, for others the challenge consist of the upstream and downstream processes. The specialization of the forwarders ensure a high quality standard and a lot of knowledge in their respective fields. For coffee there is so much to know about the good itself in order to handle it with the needed sensitivity, whereas for the car project it was more about the perfect timing and preparation for a smooth processing.

In Germany coffee will always be an import good. Freight forwarders like Berthold Vollers have perfected the transport and storage process of coffee over years and offer value added services like sampling in order to offer the best possible service for the customer. Freight forwarders like DHL GF are not specialized on one good or one service. They offer both small parcel transports and large project moves. The strength of these global forwarders is the global network and the accompanying local expertise worldwide. With that base it is possible to offer almost every possible kind of transport.

By means of the transports in this dissertation I tried to display the diversity of forwarding companies. They are always confronted with new challenges and requirements which can erupt spontaneously. To see the different ways of handling challenges was a new experience for me and I am glad that I could be part of these special transports. The knowledge within this industry is an important key for all companies which need to transport and store their goods.

Acknowledgements

First, I would like to thank DSLV (Deutscher Speditions- und Logistikverband) and DVZ (Deutsche Verkehrszeitung) for giving me the chance to participate this competition on an international level. Through this dissertation, I was able to understand what it means to stay in contact with colleagues and friends even after going separate ways. The network between different freight forwarders and the help I received show an amazing cohesion I have only got to know in this industry.

Although there were some difficulties due to Covid-19, many people have endured my countless questions, and with that, my special thanks go to:

Janna Marie van Burgeler – DHL

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Mark Hochmuth – OIA Global

Yvonne Meyer – Kühne + Nagel

Christoph Bruns – Mund + Bruns

Christoph Holtkemper – Roland Umschlag

Florian Bless – Kerry Logistics (Germany) GmbH

Thank you for all I have learned during this dissertation. As I decided to do my Master's degree in Supply Chain Management full time, I was glad to see that this had no impact on the help I received. Unfortunately, I could not accept the offer to accompany the transports by taking pictures because of national exit restrictions due to Covid-19.

Finally, I would like to thank my family and friends who kept my back free during this time. I really appreciate what you have done for me.

Bibliography

Ahlswede, A. (2020, March 9). Export von Pkw aus Deutschland 2020. Retrieved March 29, 2020, from <https://de.statista.com/statistik/daten/studie/158068/umfrage/export-von-pkw-monatszahlen/>

BGA - Bundesverband Großhandel, Außenhandel, Dienstleistungen e.V. (2014). Vielfältige Einfuhren - Vielfalt im Konsum. *Import - Garant Für Deutschlands Wirtschaftsstärke*, 8–9. Retrieved from https://www.bga.de/fileadmin/user_upload/Publikationen/BGA_Broschuere_Import_web.pdf

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung - B.B.F.W.Z.U. . (2017, February 8). Gemeinsamer Südamerikanischer Markt (MERCOSUR). Retrieved April 20, 2020, from https://www.bmz.de/de/service/glossar/G/gemeinsamer_suedamerikanischer_markt_mercosur.html

Bundesverband Spedition und Logistik e.V. (n.d.). DSLV | Reform des Seehandelsrechts. Retrieved March 24, 2020, from https://www.dslv.org/dslv/web.nsf/id/li_fdih9e8ak6.html

Deutscher Kaffeeverband. (n.d.). Retrieved March 14, 2020, from <https://www.kaffeeverband.de/de>

BVL - Bundesvereinigung Logistik e.V. Bremen. (2020, January 7). Logistik - Bedeutung für die deutsche Wirtschaft - Die BVL: Das Logistik-Netzwerk für Fach- und Führungskräfte. Retrieved April 8, 2020, from <https://www.bvl.de/service/zahlen-daten-fakten/umsatz-und-beschaeftigung>

Grundhoff, S. (2010, May 17). Wüste Vorstellungen. Retrieved March 29, 2020, from <https://www.sueddeutsche.de/auto/autotests-in-afrika-wueste-vorstellungen-1.550035>

IATA. (2015, December 29). Small Vehicles Powered by Lithium Batteries – Cargo Provisions. Retrieved March 31, 2020, from <https://www.iata.org/contentassets/05e6d8742b0047259bf3a700bc9d42b9/lithium-battery-vehicles-cargo.pdf>

IHK Stuttgart. (n.d.). Vorübergehende Verwendung ohne Carnet ATA. Retrieved April 2, 2020, from <https://www.stuttgart.ihk24.de/fuer-unternehmen/international/import-export/carnet-ata-cpd/verbringung-ohne-carnet-675284#titleInText0>

IMO. (n.d.). Safe transport of containers. Retrieved March 25, 2020, from <http://www.imo.org/en/MediaCentre/HotTopics/container/Pages/default.aspx>

Sprengel, B. (2018, December 27). Drogenschmuggel: Kokain im Kaffee, unter Bananen und im Bauch. *DIE WELT*. Retrieved from <https://www.welt.de>

Statista. (2020, March 19). Exporte aus Deutschland nach Güterabteilungen (Top 15) im Jahr 2019. Retrieved April 23, 2020, from <https://de.statista.com/statistik/daten/studie/151019/umfrage/exportgueter-aus-deutschland/>

Statistisches Bundesamt. (2020). *Kraftfahrzeuge und Kraftfahrzeugteile im zehnten Jahr in Folge Deutschlands wichtigstes Exportgut* (82). Retrieved from https://www.destatis.de/DE/Presse/Pressemitteilungen/2020/03/PD20_082_51.html;jsessionid=BCE27DE12EA98E72AE2012A7385F6779.internet721

United Nations. (2008). *List of Dangerous Goods*. Retrieved from https://www.unece.org/fileadmin/DAM/trans/danger/publi/adn/adn2009/English/03d_c_hap3-2_tableC_e.pdf

UN 3166 Fahrzeug mit Antrieb durch entzündbare Flüssigkeit. (n.d.). Retrieved April 2, 2020, from <https://www.gefahrgutbrumme.de/ADR/UN3166B.html>

Zoll. (n.d.). Zolllagerverfahren - Allgemeines. Retrieved March 25, 2020, from https://www.zoll.de/DE/Fachthemen/Zoelle/Zollverfahren/Zolllagerverfahren/Allgemeines/allgemeines_node.html;jsessionid=79698C67D6A1129780F26FDDAA2F936C.liv e4672

Appendices

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- Appendix C: Hamburg Süd Bill of Lading..... C
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Appendix A: Employees and Turnover in the German logistics sector

Supply Chain Management und Logistik



Umsatz und Beschäftigte in Deutschland



6. Januar 2020

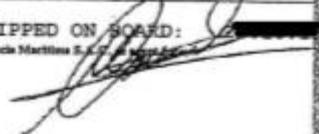
BVL - Bundesvereinigung Logistik e.V. Bremen. (2020, January 7). Logistik - Bedeutung für die deutsche Wirtschaft - Die BVL: Das Logistik-Netzwerk für Fach- und Führungskräfte. Retrieved April 8, 2020, from <https://www.bvl.de/service/zahlen-daten-fakten/umsatz-und-beschaeftigung>

Appendix B: Tipper chassis



Containertransporte Schlichtmann Transport GmbH. (2016, July 25). Retrieved April 16, 2020, from <http://www.schlichtmann-transport.de/containertransporte.htm>

Appendix C: Hamburg Süd Bill of Lading

Bill of Lading		Multimodal Transport or Port-to-Port Shipment		 www.hamburgsud-line.com									
Shipper PERALES HUANCARUNA S.A.C. - PERHUSA CAL.B NRO. 293 Z.I. FUNDO BOCANEGRA (TAMBIEN 295) PROV. CONST. DEL CALLAO - PROV. CONST. DEL CALLAO - CALLAO - PERU TELEF. (511)-421-2443 PDA REG NO. 16451800902		BL No. (also to be used as payment ref.) SUDUB9365A4BD4HG		Booking No. 9LIM023967									
Consignee ("Not negotiable unless consigned to order") [REDACTED]		Report References Vessel IMO No.: 9383235 INTBL: LI023967 RUT-SH: 20131495006											
Notify Party (See c. 8) [REDACTED]		Forwarding Agent References [REDACTED]											
Name of Recipient *		Port and country of origin [REDACTED]											
Pre-carriage by *		Domestic Routing Instructions / Also Notify / Agent at Port of Discharge [REDACTED]											
Port of Loading PAITA PE		Ocean Vessel SEALAND LOS ANGELES		Origin to be released at PAITA PE									
Port of Discharge BREMEN CITY DE		Waypoint 943N		Freight payable at ZURICH CH									
Place of Delivery * BREMEN CITY DE		Made Load Area		Made Tack Area TRUCK									
Marks & Nos.		Cont./Seal Nos.		No. of Plgs.		Description of Goods		PARTICULARS FURNISHED BY SHIPPER		Gross Weight		Measurement	
1st Transshipment port		:		BALBOA PA									
2nd Transshipment port		:		HAMBURG DE									
						2 - 20' CONTAINERS - SHIPPER'S LOAD, STOW, COUNT, WEIGHT AND SEAL							
HASU1089215				1 PACKAGE						20720.000 KGS		34.000 CBM	
Seal-Numbers													
ML-PE0415618													
003MA040678													
Tare: 2220 KG													
Size: 20' Type: DC													
Cnt. Ld.: FCLFCL													
PONU0629370				1 PACKAGE						20720.000 KGS		34.000 CBM	
Seal-Numbers													
ML-PE0415616													
003MA040680													
Tare: 2300 KG													
Size: 20' Type: DC													
Cnt. Ld.: FCLFCL													
30/220/7065 PERU													
ORGANIC ARABICA													
COFFEE TYPE "MCM													
CHOZA" CERTIFIED													
BY BIOLATINA PE-B													
IO-118 LOTE N°													
O-19-089													
						2 PACKAGES				41440.000 KGS		68.000 CBM	
Page: 1 of 2													
ORIGINAL													
vbl Item No.		Total No. of Plgs.		Declared value (See clause 4.2.(b))		No. orig. BL		3		SHIPPED ON BOARD:			
										Signed by:  Hamburg Süd			
										as CARRIER 			
										Place and date of issue PAITA PE			
										DNV-GL 00 9201-1 00 14001			
RECEIVED for shipment as specified above in apparent good order and condition less otherwise stated. The Goods to be delivered at above mentioned Port of discharge or Place of Delivery, whichever applies, SUBJECT TO Terms and conditions contained on reverse side hereof, to which Merchant agrees by accepting this Bill of Lading.													
WITNESS WHEREOF the number of original Bills of Lading stated on this side of this clause have been signed, one of which being accomplished, the others stand void, unless compulsorily applicable law provides otherwise.													
Applicable only when used for MULTIMODAL TRANSPORTATION.													

00335929

Bill of Lading

Multimodal Transport
or Port-to-Port Shipment

HAMBURG SÜD

www.hamburgsud-line.com

Shipper
PERALES HUANCARUNA S.A.C. - PERHUSA
CAL.B NRO. 293 Z.I. FUNDO BOCANEGRA
(TAMBIEN 295) PROV. CONST. DEL
CALLAO - PROV. CONST. DEL CALLAO -
CALLAO - PERU TELEF. (511)-421-2443
FDA REG NO. 16451800902

B/L No. (also to be used as payment ref.) SUDUB9365A4BD4HG	Booking No. 9LIM023967
---	---------------------------

Consignee ("Not negotiable unless consigned to order")
[REDACTED]

Export References
Vessel IMO No.: 9383235
INTEL: LI023967 RUT-SH: 20131495006

Notify Party (see 8.8)
[REDACTED]

Forwarding Agent References
[REDACTED]

Place of Receipt # [REDACTED] **Pre-carriage by** # [REDACTED]

Port and country of origin
[REDACTED]

Port of Loading PAITA PE	Ocean Vessel SEALAND LOS ANGELES	Volume 943H	Origin to be released at PAITA PE	Freight payable at ZURICH CH
------------------------------------	--	-----------------------	---	--

Port of Discharge BREMEN CITY DE	Place of Delivery # BREMEN CITY DE	Mode Load Area	Mode Disch. Area TRUCK
--	--	-----------------------	----------------------------------

Comments: Routing Instructions / Also Notify / Agent at Port of Discharge
[REDACTED]

Marks & Nos.	Cont./Seal Nos.	No. of Pkgs.	Description of Goods	Particulars furnished by shipper	Gross Weight	Measurement
--------------	-----------------	--------------	----------------------	----------------------------------	--------------	-------------

FREIGHT PAYABLE AT
VOLLERS GMBH

ZURICH SWITZERLAND BY BERTHOLD
AS PER AGREEMENT

Agreement No. (s) : REUC9000037-01779

ORIGINAL

SWI Rem No.	Total No. of Pkgs.	Declared value (See clause 4.2 (b))	No. orig. B/L 3	SHIPPED ON BOARD: By <i>Clara Aguirre Maritima S.A.</i> Hamburg Süd
-------------	--------------------	-------------------------------------	-----------------	---

Place and date of issue: PAITA PE [REDACTED]

in CARRIER

DNV-GL 100 881 450 1481

RECEIVED for shipment as specified above in apparent good order and condition unless otherwise stated. The Goods to be delivered at above mentioned Port of discharge or Place of Delivery, whichever applies, SUBJECT TO Terms and conditions contained on reverse side hereof, to which Merchant agrees by accepting this Bill of Lading.
4 WITNESSES WHEREOF the number of original Bills of Lading stated on this side set to this clause have been signed, one of which being accomplished, the others stand void, unless compulsorily applicable law provides otherwise.
Inadmissible only when used for MULTIMODAL TRANSPORTATION.

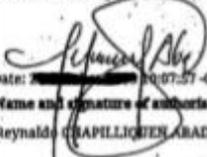
Appendix D: Organic Certificate

Certificate of Inspection for Import of products from Organic production into the European Union

1. Issuing control body or authority (name, address and code) Bio Latina Certificadora - PE-BIO-118 Jr. Domingo Millán 852, Jesús María Lima Postcode: 11, Lima, Peru (PE)	2. Council Regulation No 834/2007, Article 33 (2) <input type="checkbox"/> or Council Regulation No 834/2007, Article 33 (3) <input checked="" type="checkbox"/>										
3. Serial number of the certificate of inspection COLPE.2019.0007671 	4. Exporter (name and address) PERALES HUANCAYANA S.A.C. CAL.B NRO 293 Z.I. FUNDO BOCANEGRA (TAMBIEN 293), Callao, Peru (PE)										
5. Producer or processor of the product (name and address) PERALES HUANCAYANA S.A.C. CAL.B NRO 293 Z.I. FUNDO BOCANEGRA (TAMBIEN 293), Callao, Peru (PE)	6. Control body or control authority (name, address and code) Bio Latina Certificadora - PE-BIO-118 Jr. Domingo Millán 852, Jesús María Lima Postcode: 11, Lima, Peru (PE)										
7. Country of origin Peru (PE)	8. Country of export Peru (PE)										
9. Country of clearance/Point of entry Zollamt Bremen - DE001325 Hafenstr. 40, 28217, Bremen, Stadt, Germany (DE)	10. Country of destination Germany (DE)										
11. Importer (name, address and EORI number) [REDACTED]	12. First consignee in the Union (name and address) [REDACTED]										
13. Description of products <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">CN code</th> <th style="text-align: left;">Trade name</th> <th style="text-align: left;">Lot number</th> <th style="text-align: left;">Number of packages</th> <th style="text-align: left;">Net weight</th> </tr> </thead> <tbody> <tr> <td>09011100</td> <td>WASHED PERUVIAN ORGANIC ARABICA COFFEE V7853-01</td> <td>30/020/7065 LOTE N° 0-19-089</td> <td>2 Bulk</td> <td>41400.0 Kg</td> </tr> </tbody> </table>		CN code	Trade name	Lot number	Number of packages	Net weight	09011100	WASHED PERUVIAN ORGANIC ARABICA COFFEE V7853-01	30/020/7065 LOTE N° 0-19-089	2 Bulk	41400.0 Kg
CN code	Trade name	Lot number	Number of packages	Net weight							
09011100	WASHED PERUVIAN ORGANIC ARABICA COFFEE V7853-01	30/020/7065 LOTE N° 0-19-089	2 Bulk	41400.0 Kg							

en <https://webgate.ec.europa.eu/tracece/certificate/ci/COLPE.2019.0007671> 1 / 2

Certificate of inspection for import of products from Organic production into the European Union

14. Container number HASD1089215 PONTU0629370	15. Seal number ML-FE0415818 / 003MA040678 ML-FE0415816 / 003MA040680	16. Total gross weight 41440.0 Kg
17. Means of transport before point of entry into the Union		
Mode SHIP	International transport document SUDG08M5A4RD4RG	Identification SEALAND LOS ANGELES 943N Liberia
18. Declaration of control authority or control body issuing the certificate referred to in box 1 This is to certify that this certificate has been issued on the basis of the checks required under Article 13(4) of Regulation (EC) No 1831/2003 and that the products designated above have been obtained in accordance with rules of production and inspection of the organic production method which are considered equivalent in accordance with the provisions of Regulation (EC) No 834/2007. Date: 20/07/2020 07:37 -0500 PET Name and signature of authorised person Reynaldo CHAPILLIER ARAD  		
19. Customs information Customs warehousing <input type="checkbox"/> Inward processing <input type="checkbox"/> Customs operator Control body or control authority (name, address and code) Customs Declaration Reference Number for customs warehousing or inward processing		
20. Verification of the consignment and endorsement by the relevant Member State's competent authority Authority and Member State: Date: Name and signature of authorised person Stamp		
21. Declaration of the first consignee This is to certify that the reception of the goods has been carried out in accordance with the provisions of Article 34 of Regulation (EC) No. 834/2007. Name of the company: Date: Name and signature of authorised person Stamp		

ORIGINAL

Mail from Stefan Scheidel (2020, April 21)

F

Appendix E: Unloading coffee at Vollers



Port Commodity Logistics. (2020, February 21). Retrieved April 09, 2020, from <https://www.vollers.com/>

Appendix F: Big bag handling



Handling of Big Bags. Schrage Rohrketten-system GmbH Conveying Systems. (2014, January 20). Big Bag Handling - superschnelle Schüttgut-Verladung [Video file]. Retrieved from <https://www.youtube.com/watch?v=FJ4UfeRcfNM>

Appendix G: Example car rack



VRA Car Racks. (n.d.). Retrieved April 12, 2020, from https://www.aclairshop.com/VRA_car_racks.php

Appendix H: Boeing 747-400



BOEING 747-400

MAIN CABIN DIMENSIONS

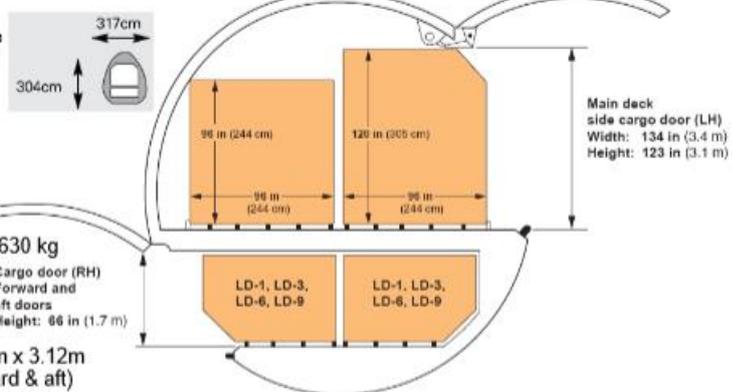
Volume main deck	21,347 ft ³ / 605 m ³
Volume lower deck	5,600 ft ³ / 159 m ³
Bulk Cargo	520 ft ² / 15 m ²

AIRCRAFT DATA

Wingspan	211'5" / 64,4m
Length	231'1" / 70,6m
Height	63'8" / 19,4m
Interior cabin width	20" / 6,1m
Max Payload	248.300 lbs / 112.630 kg
MTOW / MLW	396t / 302T
Max operating dist.	7120-8230 km

DOOR SIZES

Main cargo door	134" x 123" / 3.40m x 3.12m
RH cargo door width	104" / 2.6m (forward & aft)
Bulk cargo door	44" x 47" / 1,1m * 1,2m



Mail exchange with Janna Marie van Burgeler

Appendix I: Project transport planning (without equipment)

Number	16	20	CR	LD	Measurements	Weight	Test start	Test end
1				LD	4317x1783x1545	1251	27.10.2019	14.11.2019
2	16				4400x1841x1611	1353	27.10.2019	14.11.2019
3	16				4400x1841x1611	1338	27.10.2019	14.11.2019
4				LD	4482x1715x1466	1410	27.10.2019	14.11.2019
5				LD	4252x1759x1543	1316	27.10.2019	14.11.2019
6				LD	4252x1759x1543	1369	27.10.2019	14.11.2019
7				LD	4252x1759x1543	1300	27.10.2019	14.11.2019
8				LD	4252x1759x1543	1300	27.10.2019	14.11.2019
9			CR		4596x1828x1422	1400	27.10.2019	14.11.2019
10	16				4252x1565x1766	1500	27.10.2019	14.11.2019
11			CR		4252x1759x1447	1250	27.10.2019	14.11.2019
12	16				4223x1793x1691	1500	27.10.2019	14.11.2019
13			CR		4473x1706x1469	1159	27.10.2019	14.11.2019
14			CR		4310x1780x1420	1340	27.10.2019	14.11.2019
15			CR		4473x1706x1469	1159	27.10.2019	14.11.2019
16	16				4510x1830x1626	1496	27.10.2019	14.11.2019
17			CR		4644x1778x1482	1353	27.10.2019	14.11.2019
18			CR		4644x1778x1482	1353	27.10.2019	14.11.2019
19			CR		4310x1780x1420	1340	04.11.2019	15.11.2019
20	16				4905x1989x1719	2000	04.11.2019	15.11.2019
21	16				4905x1989x1719	2000	04.11.2019	15.11.2019
22	16				4905x1989x1719	2000	04.11.2019	15.11.2019
23	16				4252x1759x1542	1350	28.10.2019	08.11.2019
24	16				4252x1759x1543	1350	28.10.2019	08.11.2019
25	16				4527x1829x1659	1650	28.10.2019	08.11.2019
26	16				4527x1829x1659	1650		
27	16				4527x1829x1659	1650		
28	16				4527x1829x1659	1650		
29		20			5304x1904x1990	2136	28.10.2019	15.11.2019
30		20			5304x1904x1990	2178	28.10.2019	15.11.2019
31		20			5304x1904x1990	2066	28.10.2019	15.11.2019
32		20			5304x1904x1990	2150	28.10.2019	15.11.2019
	14	4	8	6				
1x 747F	7	4	8	3				
Remaining	7	0	0	3				

Mail exchange with Janna Marie van Burgeler

Appendix J: Typical car truck (open)



Autotransporte - Transport von Autos und Motorrädern. (2014, January 18). Retrieved March 31, 2020, from <https://www.kfz-mag.de/autotransporte-166173>

Appendix K: Labelling of hazardous material



UN 1203 Benzin. (n.d.). Retrieved April 2, 2020, from <https://www.gefahrgutbrumme.de/ADR/UN1203A.html>