REQUIREMENTS	SOURCE / WHY	COMMENTS
Swapfiets		
The e-Kick can be stored efficiently in the racks in the warehouse	Warehouse Berlin has a e-Kick rack which needs to be available for all roll-out locations (outside my scope)	
The e-Kick can be transported by a swapcar to the Swapfiets Member	Swapfiets way of working	Ask Floris about all transportation issues
The e-Kick needs to be a recognizable Swapfiets product	Swapfiets Brandbook	Brittney knows everything
The e-Kick has a blue front tire	Swapfiets Brandbook	PANTONE 2995
The Swaps/Customer/Year for the e-Kick is 2 for the e-Kick 2.0	Swapfiets KPI's for team Product	
e-Kicks are distinguishable from each other	Looking at Original 1, members need to know which bike is theirs. (bike color, stickers, colored bells)	Make it as defined requirement, for example, with 10,000 e-Kicks the chanches of parking them next to ieachother is x%. therefore we need 5 different colours.
The user instructions can be explained in 2 minutes	Based on my personal Store and Field experience and on the feedback from the e-Kick test day	
On the e-Kick is a place to put a non removable barcode and QR-code	With this each e-Kick can be registered in Hok and linked to a member.	non removable - under clear coat
The e-Kick is easy to use	All features of the e-Kick are self explanatory or can be explained by a Swapfiets employee in under 2 minutes. Next to that must the driving experience not differ from a normal kick-scooter, this way of driving is easy to use.	
The e-Kicks defects are detectable by the Swapfiets member	Looking at the Swapfiets app, members are able to check the defects. So all defects must be clustered in checkboxes	not in scope
The e-Kick is visually different than the sharing company scooters	Swapfiets Brandbook/ marketing strategy	Brittney knows everything
Manufacture		
The series size of the e-Kick 2.0 is 10,000		
The e-Kick is manufactured by Typhoon (China)	the e-Kick 1.0 is already manufactured by this company, I have to keep in mind that some parts are very expensive to redesign because of the dies already made. The folding mechanism and the base plate mainly.	
Use		
The e-Kick can be parked outside for 1 month	Looking at the life pattern of the user, the e-Kick can be parked somewhere outside while the user is not coming back for a month. For example when he is on vacation.	still working no rust
The e-Kick can be locked to a regular bike rack	Most cities are adapted to bike usage, we must take advantage of that by making the e-Kick compliable with bike parking spots.	
The e-Kick has a cable lock	The e-Kick must be attachable to something else. By just locking the wheels, thieves can still easily carry it away.	
The e-Kick is only allowed on the cycle paths or lanes. If absent the main road is accepted.	German approval eFKV § 11	not in scope
The e-Kick is transportable by car	User scenarios	
The e-Kick can be taken along on the public transport	User scenarios	
The e-Kick is for 1 person use	German approval eFKV § 11	check
The e-Kick can be charged in an 3 story high apartment	Customer journey	
The e-Kick can be carried for 100 meters	User scenarios: When taking it along with the public transport, some part of the station are not ridable or contain stairs. Here is carrying the only option. This must not injure the user.	
The e-Kick is easy to carry	Based on the customer journey the e-Kick must be easy to carry with one hand by for example using a grip or shoulder strap.	
Regular		
The e-Kick lifespan is 6 years	Swapfiets business model says that a product devalues in 6 years	check

The maximum weight is 55kg	German approval eFKV § 1 lid 5	Is this not too heavy to take along in the train or car?
The maximum weight of the e-Kick is 18kg	Comparing it with the Segway Max G30 who has significantly more range (60km) and therefore a heavier battery which has a weight of 19,1kg Next to that is the maximum comfortable one arm carrying weight for P50 male 18kg (Stanton, Hedge, & Brookhuis, 2004, pp. 13.4-13.20)	
The maximum e-Kick dimensions are: 700mm W, 1400mm H, 2000mm L	German approval eFKV § 1 lid 4	Are this the dimensions of the e-Kick 2.0?
Only 1 new e-Kick type will be introduced	Interview Store lead Berlin: If the members are given too much options, they will start comparing which results in unsatisfied members. Therefore the amount of e-Kick versions needs to be as low as possible.	check
The e-Kick has a minimum range of 25km	This is the average range of existing products in market, next to that is the average trip on an electric kick-scooter 3-5km. Looking at the user perspective, range is very important. But do they really need it?	no change in spec
The users are correctly informed about the range if the e-Kick	A lot of users expect the e-Kick to reach 30 km while only using the Sport mode. This 30km range is only under ideal circumstances.	
The e-Kick can be fully charged in 6 hours	Average charging time of existing products in market	no change in spec
The e-Kick is IP56 protected against dust and water	Most retail sold kick-scooter don't have warranty for use in wet weather. Swapfiets is all about taking away the customers problems and delivering them the service of mobility, even when it is wet outside. Therefore the e-Kick needs to be water resistant IP56.	How to validate this? Is this a requirement for the supplier
The e-Kick is foldable	Based on the future use scenarios (train and car transport) it must be foldable.	check
The e-Kick is hufterproof	Looking at the sharing kick-scooters, the design is made to last on the street. The retail-sold kick-scooter have some fragile components. The e-Kick must be able to withstand rough user usage and is not easily vandalizable. The users want a reliable product which they can safely park on the street. Next to that wants Swapfiets that the e-Kick can withstand some damage from heavy use, this keeps them on the streets longer and the Swap/Cus/Year low	
Main parts		
The tires are solid	There is a balance between Swaps/customer/year and the riders comfort. Looing at the data of the amount of frat tires it will dramatically impact the Swas/cus/year. Therefore solid tires are the way to go.	leave out of scope
The e-Kick has a bell or a warning signal	German approval eFKV § 6	
An Insurance sticker is on the e-Kick, if possible, located under tail light	German approval eFKV § 2 lid 2	
The e-Kick has an aluminium frame	The e-Kick 1.0 has this material because it is highly resistant to corrosion. Next to that does the manufacturer only work with aluminium or magnesium alloy. (The last one is very expensive but lighter)	check
The steering angle is limited to 150°	Limiting the steering angle to 120 degrees decreases the change of falling while driving through a pothole. (Garman et al., 2020, p. 7) https://www.youtube.com/watch?v=nJf-MedhAeA&ab_channel=DroneCampsRC	check
The e-Kick has 2 hand brakes	During the e-Kick test day, the e-Kick with the 2 hand brakes was clearly preferred over the single- or no- handbrake version.	check
The e-Kick has 2 brakes that work independently	German approval eFKV § 4	
The e-Kick has no rear wheel foot brake	Potential high failure part (checked with youtube, Benjamin, and Malcom)	
All nuts and bolts don't come loose while using the e-Kick	Swapfiets helpdesk analysis, own experience and the mechnic interview pointed all out that a lot of bolt come loose during driving. This is not acceptable and needs a solution	
Safety		
Helmet use is promoted by Swapfiets	German approval eFKV § 7 lid 6e	not in scope

Educate the members: Wear a helmet and maintain a safe speed!	(City of Austin, 2018)	not in scope
No sharp parts on the outside of the e-Kick	German approval eFKV § 7 lid 6e	Define scharp
No outer parts in the kicking way of the e-Kick	During the e-Kick test day, two participants did hurt their ankles by kicking against the rear axle nut. Next to that looking at kick-scooters in the market, most of them have these nuts hidden.	check
The throttle must return in Off-mode within 1 second after it is released.	German approval eFKV § 7 lid 7e	Is 1 second enough?
The folding mechanism is not allowed to fold during a ride	German approval eFKV § 7 lid 5. Also the mechanics from warehouse Berlin predict some member injuries due to this folding mechanism.	nice
Repairability		
The e-Kick can be repaired with the standard toolkit of a bike mechanic	The manufacturer is asked to only use standard allan key bolts and not use special types we need special tools for. https://docs.google.com/presentation/d/1a4F0ub70TYPkl4yN-z3otn8f09Ci74-f8JIfSyT8V6s/edit?usp=sharing	current toolkit https://docs.google.com/spreadsheets/d/1XwMgb_Spozar5DizVmlZ5EpyMrgeIds4JfSKgqg7pNc/edit?usp=sharing
Frequent failing parts are easily accessible and replaceable	Based on the Swapfiets Helpdesk analysis and the User survey	
The e-Kick has as as small amount of detachable parts as possible	Keeping the amount of spare parts low improves the logistic process of the warehouses.	risk inventarisation
The lifespan of each individual part is at a minimum of 6 months	To keep the amount of Swaps/customer/year low, a failing part must be prevented. Looking at a Deluxe7 with a S/C/Y of 1.4 and assuming an electric vehicle will have a higher risk of failure, the 6 month period was determined.	check
Electric components		
As many cables as possible are invisible	no water access, better protected against failure and vandalism.	
A problem inventorisation for the electric components is possible	At the Warehouse Berlin visit the mechanics pointed out they need to inventarize what part is broken. However, is this really necessary? Is by just replacing the elctrical part the issue solved?	
The motor has a power limit of 500W	German approval eFKV § 1 lid 3	keep current motor so out of scope
The e-Kick has a battery power indicator	A user needs to get an indication of the range he can do, also if the battery is chaging/charged or not.	check
The e-Kick has not hackable	The Segway Max was hackable via Bluetooth, so by getting rid of Bluetooth, the e-Kick is not hackable	
Ergonomics		
The handbrakes are lined up with the arm direction of P50 male	At the e-Kick test day almost all participants recommended to adjust the hand brake angle in a more comfortable position in line with their arms. This results in an easier reaching to the brakes which makes it safer.	top
The e-Kick dimensions are according to standing posture P50 male	At the e-Kick test day the dimensions of the different kick-scooters different. The participants preferred the higher models because of their streight up position. This e-Kick needs to be targeting the western population and must satisfy the average (P50) western european man (85% of users is man)	top
Speed		
The e-Kick has a maximum speed of 20km/h	German approval eFKV § 1	
The e-Kick has a minimum speed of 6km/h	German approval eFKV § 1	
The e-Kick is able to drive at a constant speed of 8km/h (pedestrian mode)	German approval eFKV § 1	

Lights		
The e-Kick has a white front light	German approval eFKV § 5	
The e-Kick has a red rear light	German approval eFKV § 5	
The e-Kick has a rear reflector	German approval eFKV § 5	
The e-Kick has side reflectors	German approval eFKV § 5	
Environment		
The e-Kick is resistant to cold weather	Swapfiets gives their customers the service of mobility unregarding weather circumstances. The e-Kick needs to fullfill this purpose. Next to that it is a competing advantage looking at the current retail market for electric kick-scooters.	define cold
The e-Kick is resistant to hot weather		define hot
The e-Kick is resistant to rainy weather		
The e-Kick can be driven through puddles	IP56 water resistant	
All parts withstand vibrations of rough terrain	Online newsposts, youtube reviews, the e-Kick test day, user interview all tell you the same thing: electric kick-scooters with solid tires are not handling high frequency vibrations while driving. This results in a low comfort experience and a higher failure rate of e-Kick parts.	