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1. D2.3 Report on product selection methodology

1.1 Objective and data analysis

This deliverable has the objective to develop a methodical approach for the selection of representative products for the subsequent product conformity testing. The approach consisted of the selection of 60 TV models for the first batch, 40 TV models for the second batch and, based on the findings of the test results from batch 1 and 2, a third batch of 62 TV models was tested. A total of 201 TVs units have been planned for the physical testing activities. The list of models for the 3rd batch was not planned initially, since it was dependent upon the rate of non-compliance of the two first batches.

For the purpose of the project, it was initially decided to select 2 sets of 60 TV models each, to select batch 1. The reason for this decision is twofold:
First of all, the consortium includes three test laboratories and the allocation of 20 TV models per test lab for the first batch was mutually agreed upon during the kick-off meeting. A second set of 60 TVs, selected based on the same methodology, would ensure a fast supplementation of similar products in case that one model of the first set is for some reason not available anymore or cannot be purchased. Depending on the test results, some products of the first batch might need to be purchased again for conformity testing (3 additional units tested in a second testing step in case of suspected non-compliance) or new products from the selected second batch can be purchased for first testing. The 2 sets of 60 TV models approach therefore ensures complete coverage of products for the physical testing.
The second reason is the result of the market analysis (see Deliverable 2.2, available on the project website). The market analysis showed the diversity of the European market in terms of manufacturers and brands that are offered. Accordingly, in the selection of the first batch, the focus has been placed on covering the most representative products, while the second batch has a focus on the full range of available products, to be representative of the diversity of the existing market. The third batch will cover criteria developed as part of a learning process and points of interest developed during the previous batches.
According to available data and the Amazon bestseller list, almost 60% of the EU market is covered by a few A-brands including Samsung, LGE, Sony, Toshiba, Panasonic, Philips, Thomson and TCL. The remaining 40% consist of devices from about two dozen other brands, including a handful of brands from the Turkish manufacturer Vestel.

The TVs offered by these manufacturers are covering all typical screen size segments with a slightly increasing market share of medium and larger TVs. In terms of technology, LCD LED TVs are currently the most dominant display technology (2012 and 2013 data). Plasma and LCD CCFL are only accounting for about 4% to 6% of current sales. Although some OLED TVs have been presented at trade shows and entered the market, this technology is slowly reaching an order of magnitude and therefore remains a product of the near future. In consequence, the selection of products for testing will mainly focus on LCD LED and Plasma TVs, however two OLED TVs will be tested under the third batch With respect to display resolution and aspect ratio, the market analysis indicated that Full-HD in 16:9 is becoming the baseline. Still, there are HD-ready TVs available in the smaller size segments. The introduction of TVs with even higher resolutions such as QF-HD and 4K just started. These products for early adopters are correspondingly more expensive and not yet mainstream.

Connected or Smart TVs are an important trend and such products have already been placed on the market. This trend is reflected by an increase of average product price in the medium size TV segments (32” to 42”) over the last year. The cost factor is a relevant selection criterion for the European market. The publically available market data from GfK indicate that basic economic conditions in a particular EU Member State considerably influence the buying behavior of the customers. It is therefore not surprising that the customers in the economically strong Member States are purchasing larger and more expensive (A-brand) products. But in markets such as UK, France and Germany, low-priced products can also be found in the bestseller lists.

With respect to the energy efficiency classes, the Amazon bestseller lists indicate that the majority of products are Class A and only a few older models belong to Class B. Unfortunately energy efficiency labeling data could not be retrieved for all the products from the national Amazon websites. As a result of batch 1 and 2, TV models with high energy efficiency classes were selected for batch 3, since this category was underrepresented before.

1.2 Selection methodology

Against the background of the conducted market analysis, it has been decided not only to cover the representative products based on sales figures and bestseller lists (first batch), but also the full spectrum of products and brands available on the European market (second batch). Due to the discrepancy between models planned for retesting to reach the total number of 201 TV models, and products that actually went to step two testing, it was decided to conduct a 3rd round of physical testing. Selection criteria for batch 3 encompassed aspects that were underrepresented in the previous two batches and provided the possibility to focus on key points of interests learned from the previous batches, such as for instance models with twin/triple tuners.

As a result, the product selection for the 1st batch of 60 TVs models comprises a 60% share of A-brands and 40% share of other brands. This will ensure that we cover the representative market in terms of unit sales. The 2nd batch of the study intends to check compliance across all brands. The third batch will cover all brands that were recently placed on the market and which have not been tested in batch 1 and batch 2, as well as A-brands.

Following the results of the 1st batch testing (multiple testing of suspected non-compliant products is possible), the 2nd and 3rd batches will complement the analysis and aim at a full spectrum of products and brands offered on the European market, by including models with lower market shares which have not been tested in the 1st batch.

The list for product selection was defined in form of a methodology consisting of multiple criteria that were approved by the ComplianTV consortium. The pre-selection could not be based on full randomness (e.g. through a random selection software) to ensure relevant coverage of all aspects of interest. Indeed, given the above criteria and the restriction on the date of placement on the market, a wider selection of products to enable a random model selection was not possible, partly due to the lack of the full picture of the market and the fact that it is very dynamic. For instance, for batch 3, having to consider the distribution of screen sizes, the type of (A and non-A) brands, the distribution of brands, the distribution of declared EEC values and different technology options, the number of television devices placed after May 2014 is leading to an already limited list. In fact, some older models were included since for a few options, the number of TVs available was not sufficient, since otherwise, double/triple tuners, A++ models and the OLED technology would not be covered as intended. Sub-randomisation for all TV models selection was thus not possible.

The full lists of all TV models in the three batches, as well as the corresponding test laboratory, can be found on the ComplianTV website (www.compliantv.eu).

1.2.1 Product selection: 1st batch of TVs

According to the findings of the market analysis, we allocate 60% of the models share to the bestselling brands (A-brands). For the 1st batch of 60 TVs models, this is an equivalent of 36 products from 8 brands (see Table 1-1 below for details).
With respect to the display technology of the 60 TVs models in the 1st batch, 57 models will be LCD and 3 models will be Plasma. Only one TV model will be a LCD with CCFL backlight, while all others will be LED backlight.
In terms of display size segments, we reflect the current market development and take the pragmatic approach of allocating 25%, i.e. 15 TVs models, to each of the four screen size segments (<32", 32", 33"-42", >42"). It is intended to distribute the selection to as many individual screen sizes as possible. For the 1st batch, TVs with screen sizes <16" and >55" are excluded.

Table 1-1: TV selection matrix for the 1st batch (A-brands)

Brand	Number of TVs	Share of total (in %)
Samsung	9	15.0
LGE	6	10.0
Sony	4	6.7
Toshiba	4	6.7
Panasonic	4	6.7
Philips [TVP]	3	5.0
Thomson	3	5.0
TCL	3	5.0
Subtotal	36	60.0
Other brands	24	40.0
Total	**60**	**100.0**

The remaining 40%, i.e. 24 TVs models, will reflect the actual market situation only partially and include already a broader spectrum of brands with small market share (see **Table 1-2** for details). However, this list is not yet fully comprehensive in terms of the full spectrum of brands and products available on the market.

Table 1-2: TV selection matrix for the 1st batch (non A-brands)

Brand	Number of TVs	Share of total (in %)		Brand	Number of TVs	Share of total (in %)
Sharp	2	3.3		Hisense	1	1.7
Finlux [Vestel]	2	3.3		TechniSat	1	1.7
Medion [Vestel]	2	3.3		Odys	1	1.7
Grundig	2	3.3		SEG [Vestel]	1	1.7
Telefunken [Vestel]	2	3.3		Nevir	1	1.7
Sunstech	2	3.3		Dyon	1	1.7
Loewe	1	1.7		Xomax	1	1.7
Hannspree	1	1.7		Funai	1	1.7
Subtotal	14	23.3		Haier	1	1.7
Other brands	10	16.7		Reflexion	1	1.7
(sub)Total	**24**	**40.0**		***(sub)Total***	**10**	**16.7**

1.2.2 Product selection: 2nd batch of TVs

Due to the findings of the 1st batch, the 2nd batch covered a wider spectrum of products and brands rom the European market. As shown in **Table 1-3**, the share of A-brands was significantly reduced to 30% (instead of 60% in the 1st batch). Additionally, the second TV brand list was extended with brands such as Orion, Blaupunkt and Nevir which have not been covered in the 1st batch (see **Table 1-4**).

Table 1-3: Draft TV selection matrix for the 2nd batch (A-brands)

Brand	Number of TVs	Share of total (in %)
Samsung	3	5.0
LGE	2	3.3
Sony	2	3.3
Toshiba	1	1.7
Panasonic	1	1.7
Philips [TVP]	1	1.7
Thomson	1	1.7
TCL	1	1.7
Subtotal	12	30.0
Other brands	28	70.0
Total	**40**	**100.0**

Table 1-4: TV selection matrix for the 2nd batch (non A-brands)

Brand	Number of TVs	Share of total (in %)	Brand	Number of TVs	Share of total (in %)
Sharp	2	3.3	Hisense	2	3.3
Finlux [Vestel]	1	1.7	TechniSat	1	1.7
Medion [Vestel]	1	1.7	Odys	1	1.7
Grundig	1	1.7	Lenco	1	1.7
Telefunken [Vestel]	1	1.7	Nevir	1	1.7
Sunstech	1	1.7	Dyon	1	1.7
Loewe	1	1,7	Level	1	1.7
			Funai	1	1.7
Subtotal	8	43.3	Haier	1	1.7
Other brands	20	26.7	Reflexion	1	1.7
(sub)Total	**28**	**70.0**	Orion	1	1.7
			Tristan Auron	1	1.7
			Grunkel	1	1.7
			Blaupunkt	1	1.7
			Seiki	1	1.7
			Dual	1	1.7
			Kendo	1	1.7
			CHANGHONG	1	1.7
			Akai	1	1.7
			(sub)Total	**20**	**26.7**

In terms of display size segments, the same pragmatic approach as for the 1st batch, was taken, allocating 25%, i.e. 15 TVs, to each of the four screen size segments (<32”, 32”, 33”-42”, >42”). The intention was to cover as many individual screen sizes as possible and we also included screen sizes <16” and >55” in the 2nd batch.

The results from this batch raised additional aspects which were included in the product selection for the 3rd batch.

1.2.3 Product selection: 3rd batch of TVs

For the selection of the 3rd batch, a variety of criteria was applied, to ensure a wide coverage of all relevant factors learnt from batch 1 and 2.

For the 3rd batch, additional criteria were added and included, such that only models put on the market after April 2014 were selected for the list. This was one key lesson learnt from the previous batches, to avoid shortage of supply in case of step 2 testing, as experienced in batch 1 and 2. One problem faced during the previous batches, was that a few models were no longer available for step two testing, because certain models were outdated and taken off the market. Based on this first criterion, the second step was to look for brands, that were not covered in the previous two batches and which fulfilled the date of placement criterion mentioned before.

As a third step, models with high energy efficiency class such as A++ were selected, since this EEC was underrepresented in the two previous batches. As in batch one and two, four screen size segments were defined, and an even split between them was aimed. As a last step, a deliberate search for models with advanced technology, such as twin and triple tuners, was done and such models were included into the list. A slightly extended list remained, and was shortened based on the availability of the different TV models in EU countries, based on GfK data. Only models that could be purchased in 2 or more countries were added to the list while the rest was taken out.

In terms of display size segments, the same approach as for the previous batches, was aimed, allocating 25% to each of the four screen size segments (<32", 32", 33"-42", >42"). However, due to the new interest in high EECs as well as Twin/triple tuner technology, the larger size segment of > 42" was increased, while the other three segments remained even.

Table 1-5: TV-selection matrix for the 3rd batch (A-brands)

Brand	Number of TVs	Share of total (in %)
Samsung	4	6.4
LGE	4	6.4
Sony	2	3.2
Toshiba	2	3.2
Panasonic	5	8
Philips [TVP]	7	11.2
Thomson	2	3.2
TCL	1	1.6
Subtotal	27	43.5
Other brands	35	56.5
Total	**62**	**100.0**

Table 1-6: TV- selection matrix for the 3rd batch (non A-brands)

Brand	Number of TVs	Share of total (in %)
Medion	1	3.3
Grundig	3	1.7
Subtotal	4	6.5
Other brands	31	49.6
(sub)Total	**35**	**56.5**

Brand	Number of TVs	Share of total (in %)
Akai	2	3.2
AvTex	1	1.6
Changhong	1	1.6
Digihome	1	1.6
Digiquest	1	1.6
Funai	2	3.2
BluSense	1	1.6
Gelhard	1	1.6
Generic	1	1.6
Haier	1	1.6
Hisense	1	1.6
Jaytech	1	1.6
JVC	1	1.6
Kendo	1	1.6
Linsar	1	1.6
LOGIK	1	1.6
Majestic	1	1.6
Manta	1	1.6
Marionola	1	1.6
Master	1	1.6
Miia	1	1.6
Nevir	1	1.6
Orion	2	1.6
Polaroid	1	1.6
SWEDX	1	1.6
Technisat	1	1.6
Techwood	1	1.6
(sub)Total	**31**	**49.6**

1.2.4 Round Robin Testing

In order to align the testing procedures and configurations among the three testing laboratories of the consortium, a RRT with one single TV set will be conducted. In accordance with the three testing laboratories, it was decided to perform the RRT with the LCD TV Dyon Omicron 24.

1.2.5 Product selection per laboratory

Along with the selection of the total TVs models, the allocation of different TV models for each laboratory was weighted against screen size and market price. Differences concerning the total budget among the three test laboratories were balanced during the three batches.

The purchasing of TVs from different retails have been challenging and the individual purchase lists had to be slightly revised at times. To support the purchase procedure for labs, TUB established a list of suggested e-shops for all models in the purchase list. One permanent problem was that one or more products from the provided list were no longer available or could not be shipped. To ensure a uniform practice of the revision of the procurement list without changing the selection methodology, the following approach was developed. If TV sets could not be shipped to the laboratories in Germany and the Netherlands (by the suggested e-shop from the purchase list), the following alternatives were applied, by order of priority:

1. A different supplier than the suggested e-shop, but in the same country was selected
2. The same TV model was purchased in the lab country from a different supplier
3. TUB was informed if a TV set is not available from an alternative supplier. TUB would then provide an alternative model which fits into the methodology.

More information
about the project activities
and all of its results
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