PHILIPS

sense and simplicity

When reliability meets green: Econova LED TV

Filip Van Brugghe
Philips Innovative Applications, Brugge

EISA AWARD Best Product 2010-2011 GREEN TV Philips 42PFL6805

NOVEMBER 23RD|2010 CONFERENCE ON ENVIRONMENTAL TECHNOLOGY LOCATION: OFFICIERSCASINO SOESTERBERG
PLOT CONFERENCE 2010
TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

The design of the 42PFL6805H TV started with the end in mind. It is a TV with the lowest energy consumption without compromising on picture quality. In a timeless full aluminum body. Designed to be used over and over again. Where you never have to replace batteries anymore.

Where eco meets design

ECO DESIGN

EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

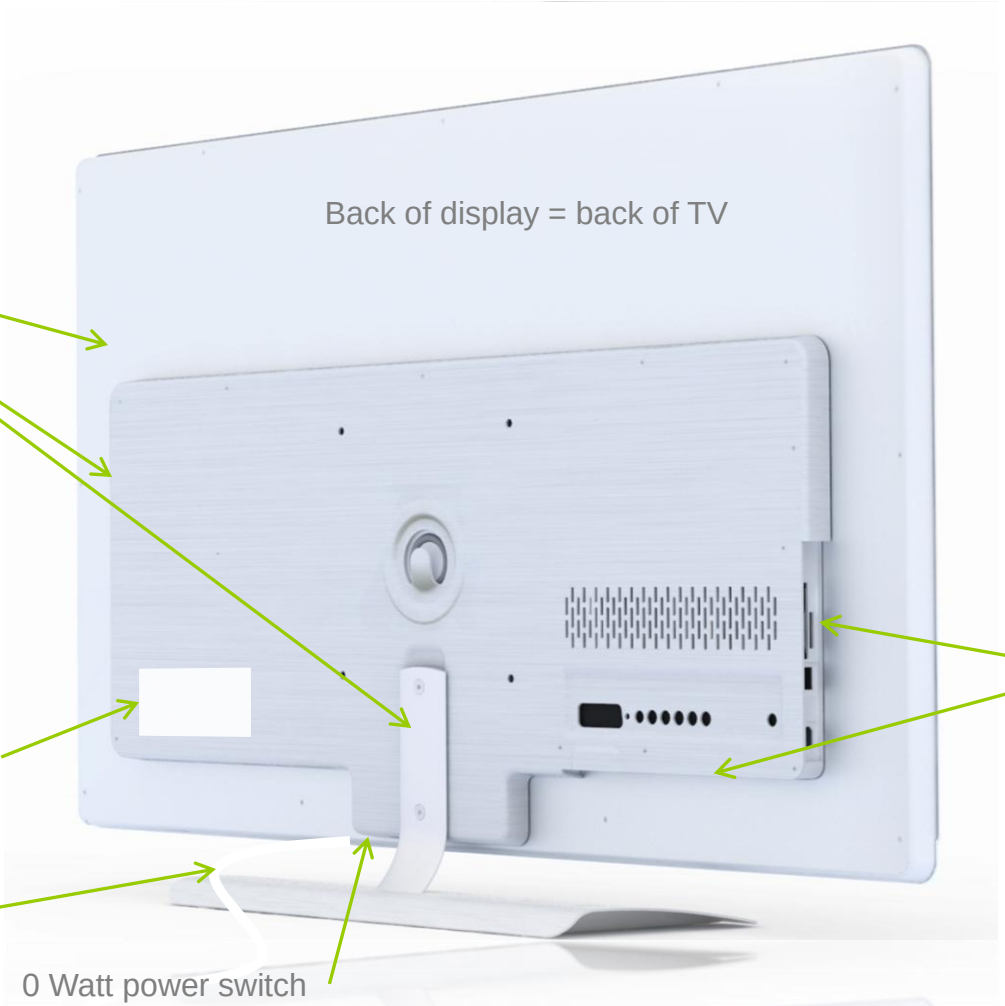
ECO Design / *OVERVIEW FRONT*

EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

ECO Design / *OVERVIEW BACK*



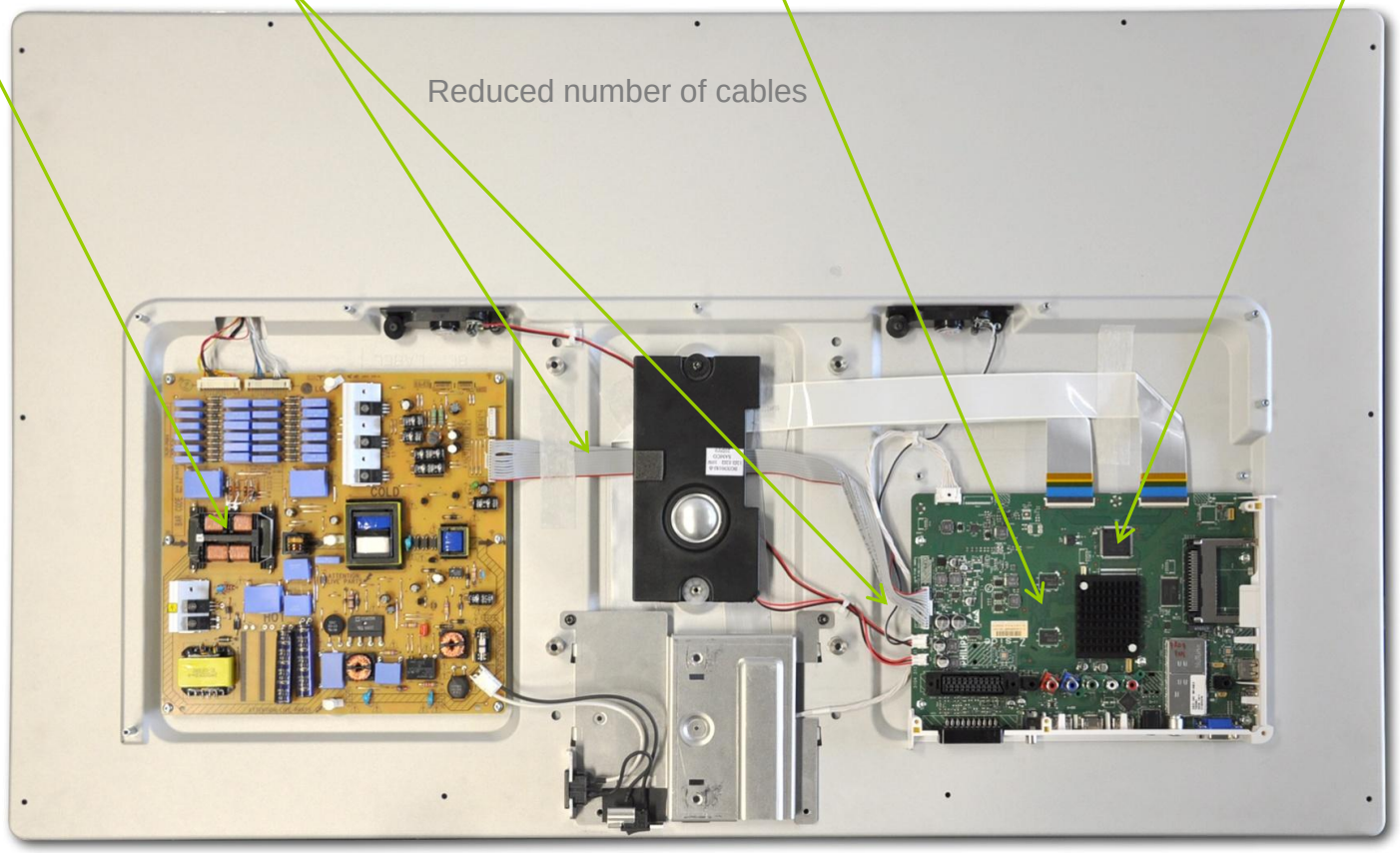
EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

ECO Design / *OVERVIEW INSIDE*

Halogen free supply Halogen free cables Halogen free Signal processing board Integrated display electronics



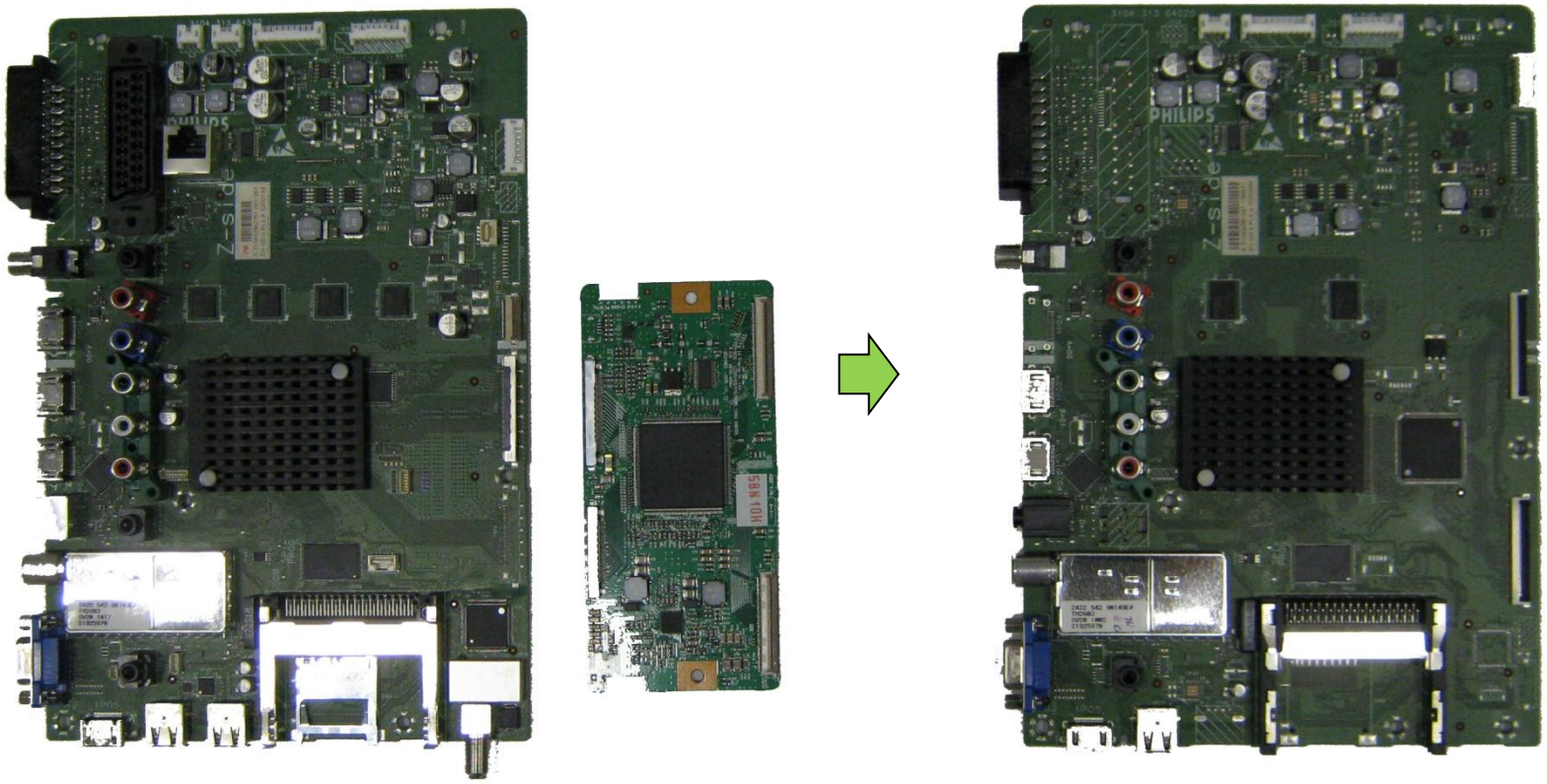
EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

NOVEMBER 23RD|2010
CONFERENCE ON ENVIRONMENTAL TECHNOLOGY
LOCATION: OFFICIERSCASINO SOESTERBERG
PLOT CONFERENCE 2010
TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

ECO Design / INTEGRATED DISPLAY ELECTRONICS



EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

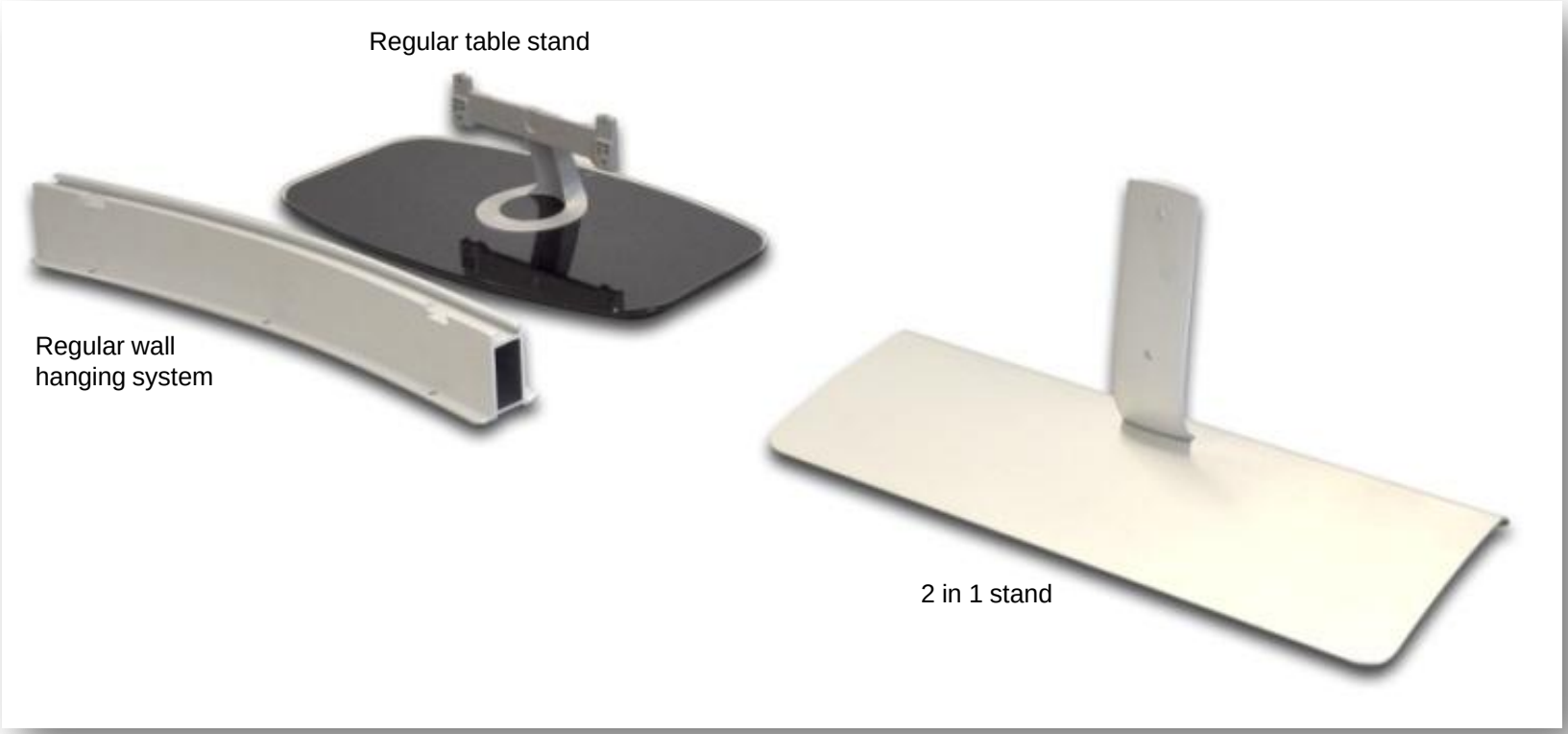
NOVEMBER 23RD|2010
CONFERENCE ON ENVIRONMENTAL TECHNOLOGY
LOCATION: OFFICIERSCASINO SOESTERBERG
PLOT CONFERENCE 2010
TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

Eco design / 2 IN 1 STAND

More and more people are hanging their TV on a wall. To avoid that people thrown away the stand, the 2 in 1 stand has been developed combining the functionality of a regular table stand with the functionality of a regular wall hanging system.



EISA AWARD Best Product 2010-2011 GREEN TV Philips 42PFL6805

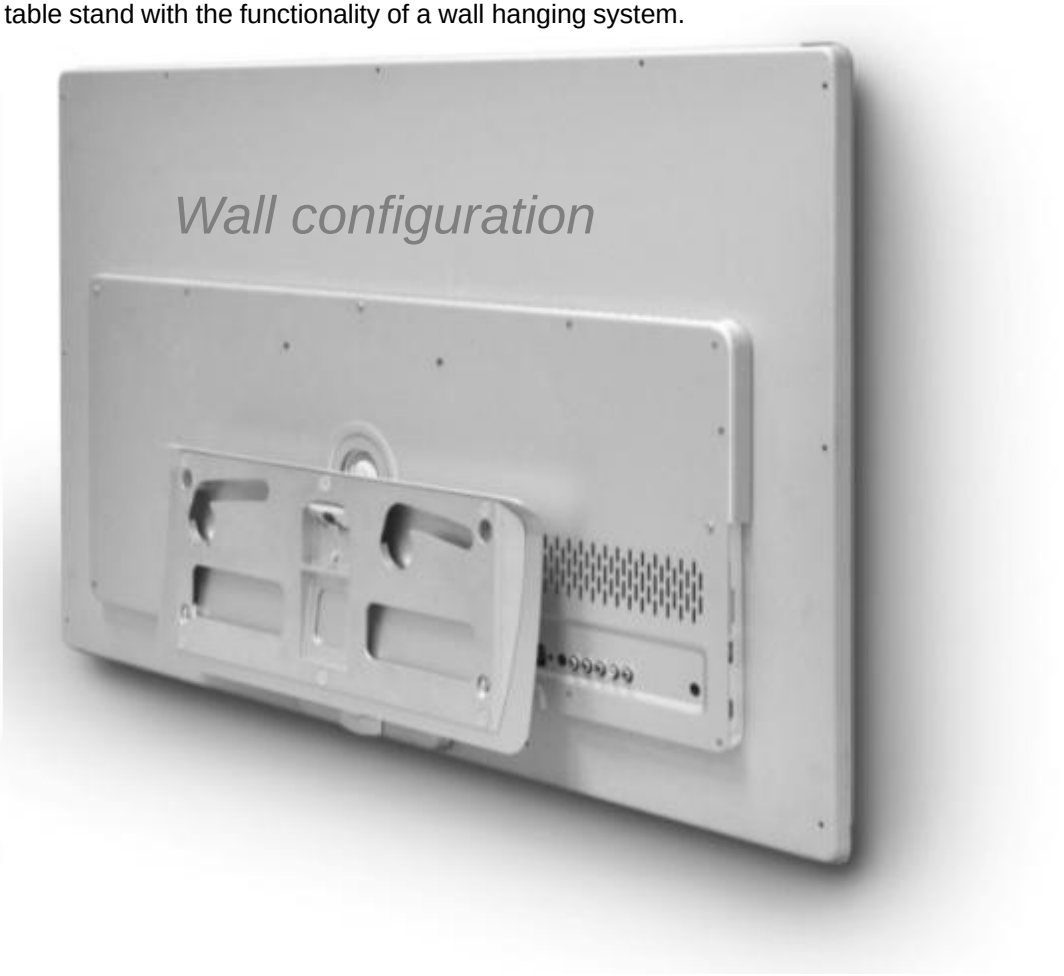
NOVEMBER 23RD|2010 CONFERENCE ON ENVIRONMENTAL TECHNOLOGY LOCATION: OFFICIERSCASINO SOESTERBERG PLOT CONFERENCE 2010 TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

Eco design / 2 IN 1 STAND

More and more people are hanging their TV on a wall. To avoid that people thrown away the stand, the 2 in 1 stand has been developed combining the functionality of a regular table stand with the functionality of a wall hanging system.



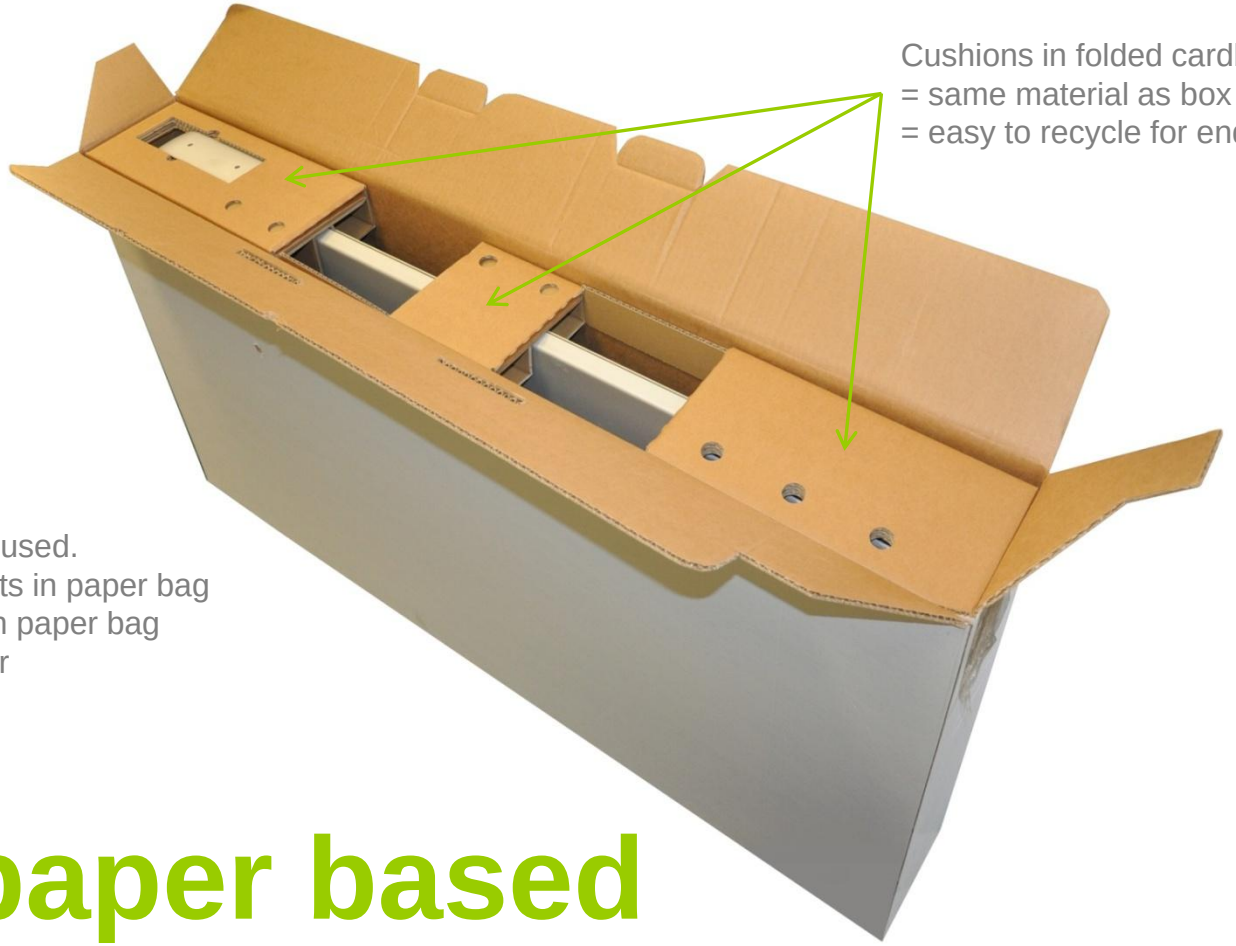
EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

NOVEMBER 23RD|2010
CONFERENCE ON ENVIRONMENTAL TECHNOLOGY
LOCATION: OFFICIERSCASINO SOESTERBERG
PLOT CONFERENCE 2010
TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

ECO Design / *OVERVIEW PACKAGING*



Cushions in folded cardboard
= same material as box
= easy to recycle for end customer

No more plastic is used.
- Stand components in paper bag
- Remote control in paper bag
- Dust bag in paper

100% paper based

EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

NOVEMBER 23RD|2010
CONFERENCE ON ENVIRONMENTAL TECHNOLOGY
LOCATION: OFFICIERSCASINO SOESTERBERG
PLOT CONFERENCE 2010
TESTING FOR SUSTAINABILITY

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

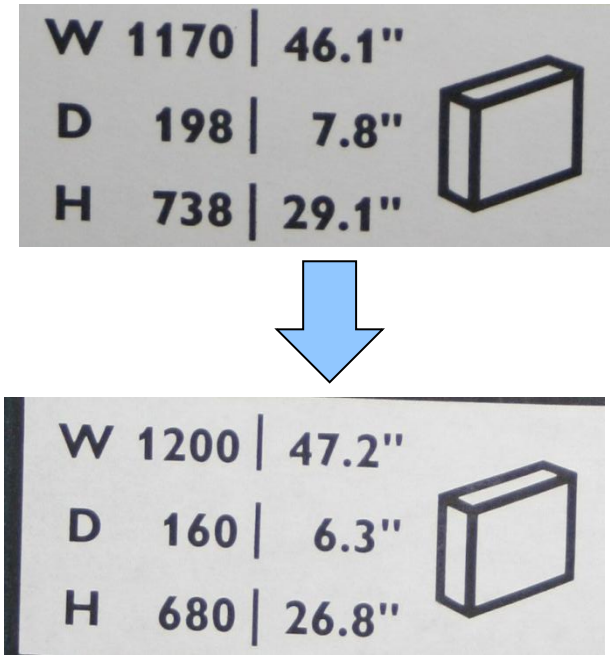
ECO Design / *PACKAGING*

EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

ECO Design / *OVERVIEW PACKAGING*

234 TV's per mega trailer



480 TV's per mega trailer

PHILIPS

ECO Design / SOLAR REMOTE

- **Powered by light.** The remote is charged by the solar cell, even for indoor light conditions. For those users who keep the remote in very low light conditions, the battery has capacity to keep it working for a number of months. If there is a persistent shortage of light, an indication on the TV is given when the remote's battery is running low.
- **No battery replacement.** The remote has one rechargeable battery (Lithium Ferrite battery) in which the light energy is stored. This battery lasts the whole product life.
- **Energy efficient power management**. The optimized energy consumption of the electronics results in a low energy need and thus maximum usability of the remote.
- **Materials.** The top plate is made from recycled aluminium. No additional finishing has been added to the plastic housing.

EISA AWARD Best Product 2010-2011 GREEN TV Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

ECO Design / *GREEN USER INTERFACE*

All Energy related features are directly accessible via a dedicated Eco button on the remote control.

One push on the remote control's ECO button brings up a shortlist with all the major power consumption related features.
The user can instantly see what is enabled through the addition of the Green tick mark behind each feature.

PHILIPS

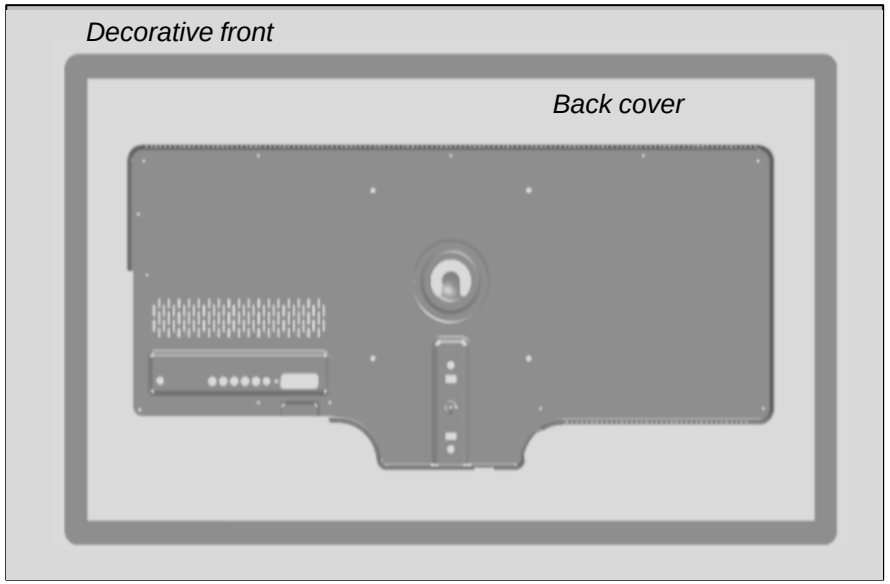
ECO Design / MATERIALS

ALUMINIUM

Housing. All large housing parts (51% of total set weight) are made from aluminium. The main advantage from an environmental point of view is that aluminium **'will be' recycled (not 'can be')** at end of life. In addition, 70% of all used aluminium in the 42PFL6805H is recycled aluminium.The production energy of recycled aluminium is only 5 to10% of producing virgin aluminium. That's why Philips has strived to use as much as possible recycled aluminium.

Design. Aluminium is an authentic material and is very well perceived from a design perspective. **Design and eco, a perfect combination.**
In addition, **aluminium has very goods cooling properties** resulting in a small amount of cooling slots needed, a secondary design advantage.

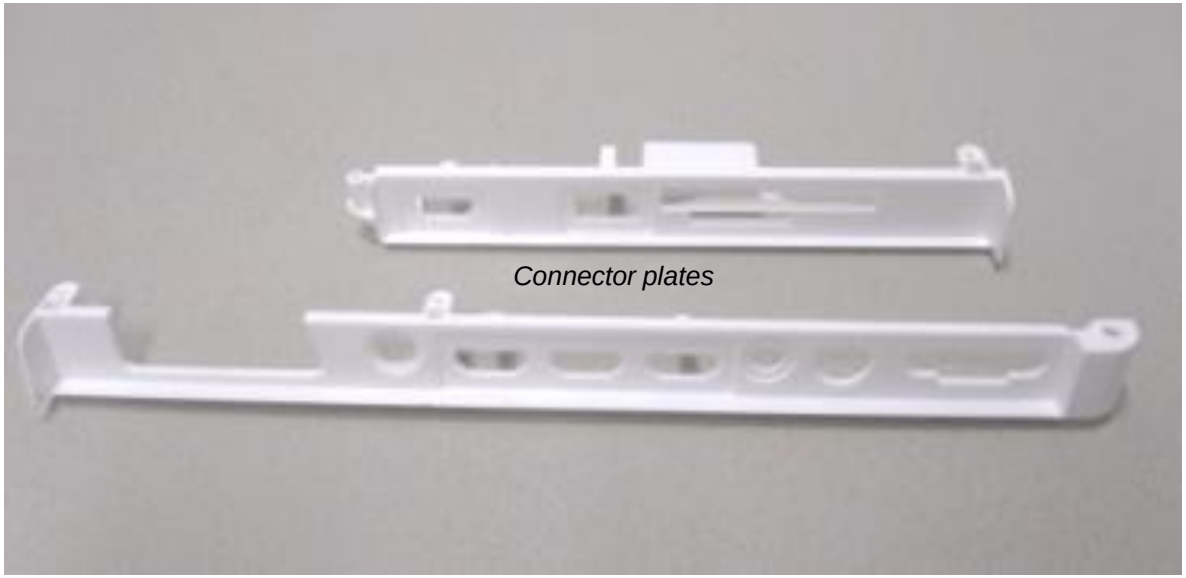
Backcover and front cut from same plate (nesting).
In traditional manufacturing, making the decorative front would result in a large inner parts being scrapped. For the 42PFL6805H project, **we made the backcover out of this inner part.** The limited amount of scrap that is left, is melted again into fresh aluminium with the same properties, but with only a fraction of the initial production energy required.



ECO Design / MATERIALS

PLASTIC

Only 3% of total weight is plastic. Since most large housing parts are made from aluminium, only 3% of the total weight is plastic. Also here an effort is made to reduce the environmental impact by using recycled grades where possible. The connector plates (see picture) for example are made from **96% post industrial recycled PC**. Of course all these plastics are halogen free.



Connector plates

PHILIPS

Where eco becomes reliable

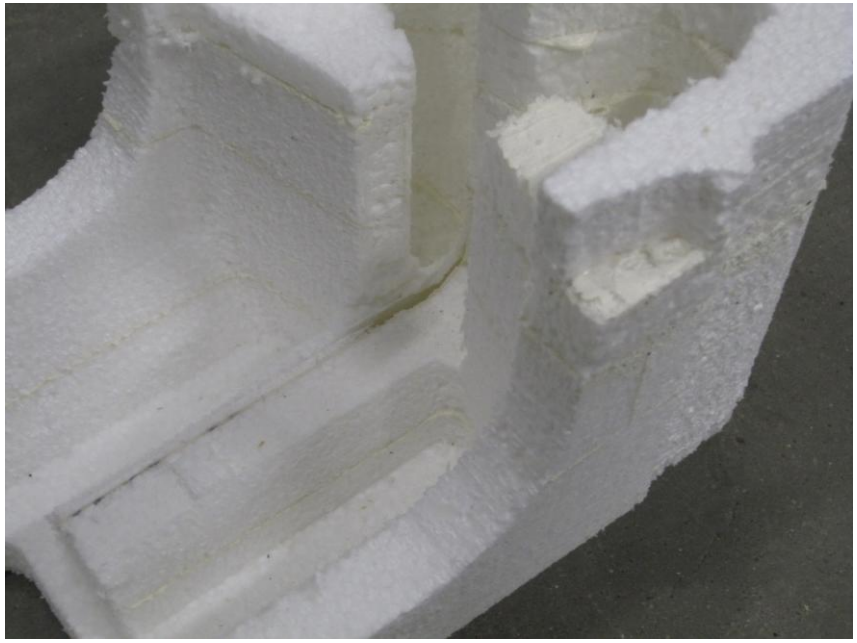
RELIABLE DESIGN

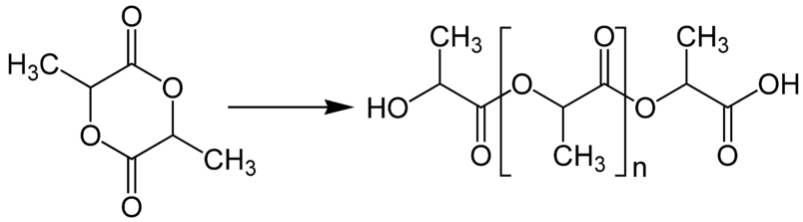
EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

Packaging / ALTERNATIVES: PLA (POLYLACTIC ACID)



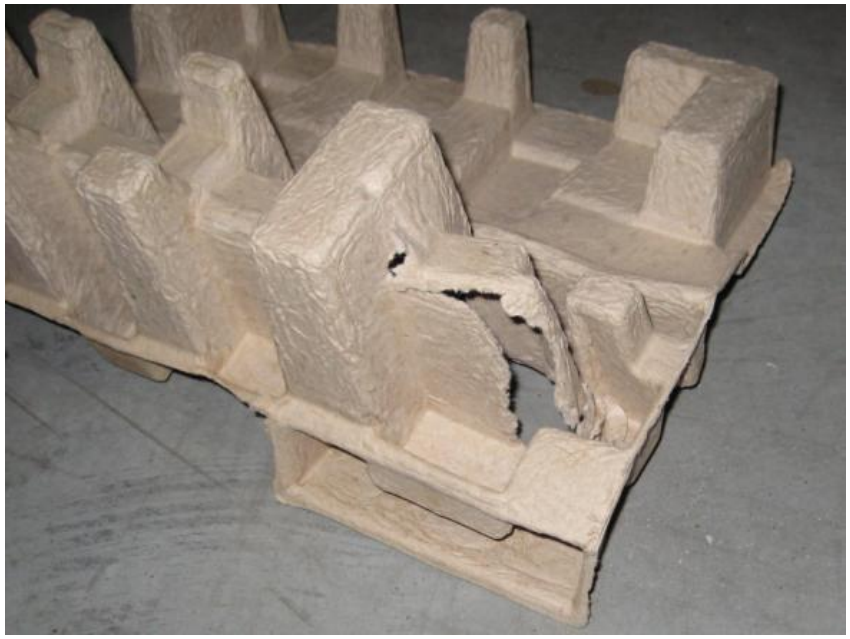


PHILIPS

Packaging / ALTERNATIVES: FOLDED CARDBOARD

PHILIPS

Packaging / ALTERNATIVES: PAPERPULP



PHILIPS

Packaging testing / VIBRATION TEST

- Simulation of transportation of TV

EPS	PLA	Folded cardboard	Paper pulp

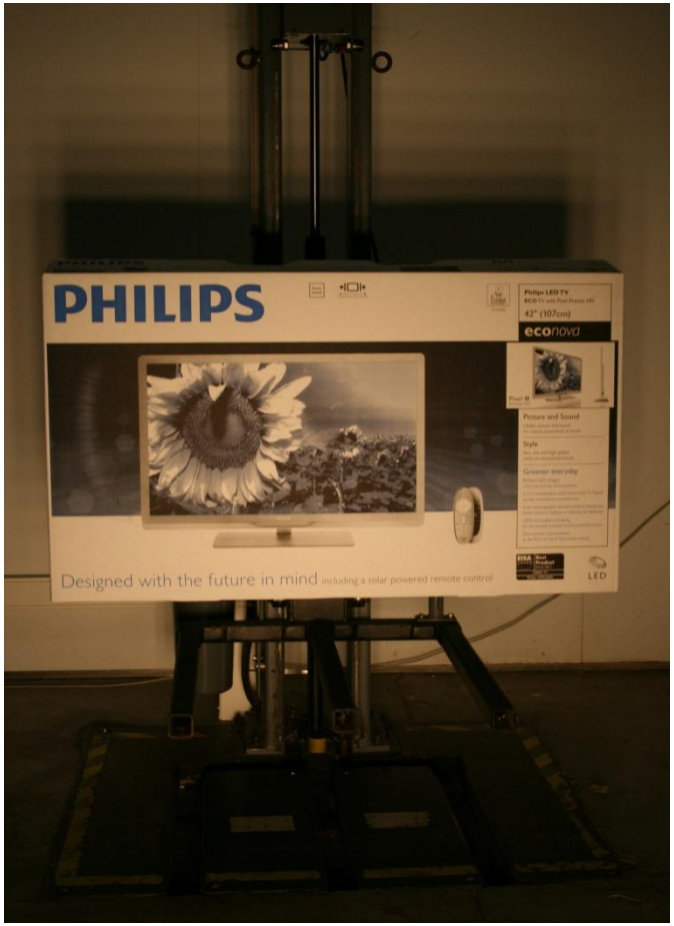
PHILIPS

Packaging testing / DROP TEST

- Handling simulation of TV

EPS	PLA	Folded cardboard	Paper pulp
	*		

* Density is not fully under control as a process parameter.



Packaging testing / STORAGE: TEMPERATURE TEST

- Storage simulation of TV

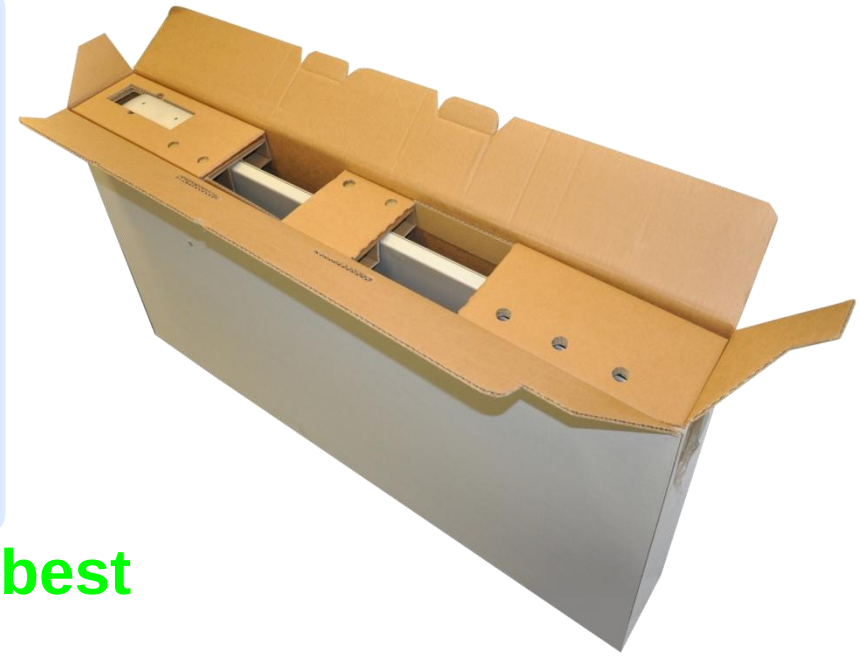
	EPS	PLA	Folded cardboard	Paper pulp
Dry heat		*		
Cold				
Damp heat		**		

* plasticizing of PLA

** fungal growth in humid conditions

Packaging testing / SUMMARY

	EPS	PLA	Folded cardboard	Paper pulp
Testing				
Cost				
“Green”				



In this case folded cardboard is best solution as “green” packaging

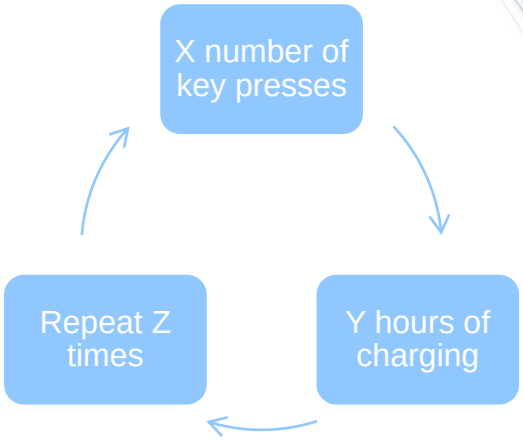
PHILIPS

Solar remote / RELIABILITY

- Goal:
  - no battery replacement
  - Charging thru light
  - Alternative charging thru micro USB

Reliability tests

Charging / using remote



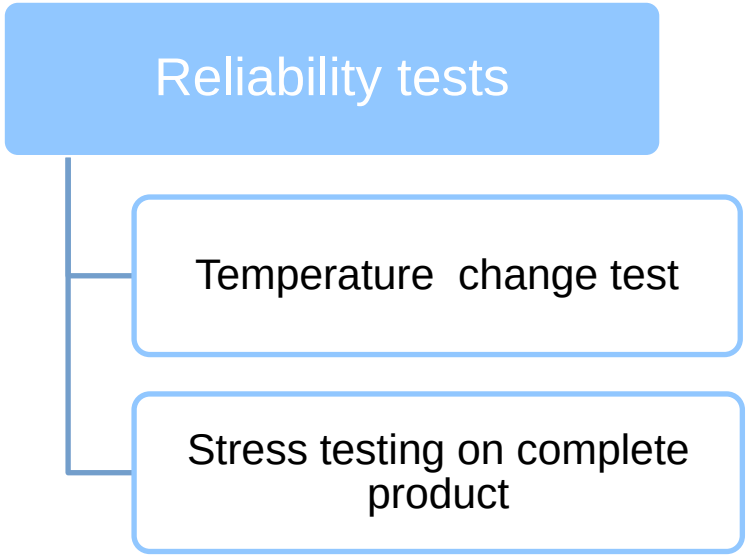
EISA AWARD Best Product 2010-2011
GREEN TV
Philips 42PFL6805

FHI PLATFORM OMGEVINGSTECHNOLOGIE

PHILIPS

Halogen free / RELIABILITY

Halogen free printed circuit board, plastics, cables,…



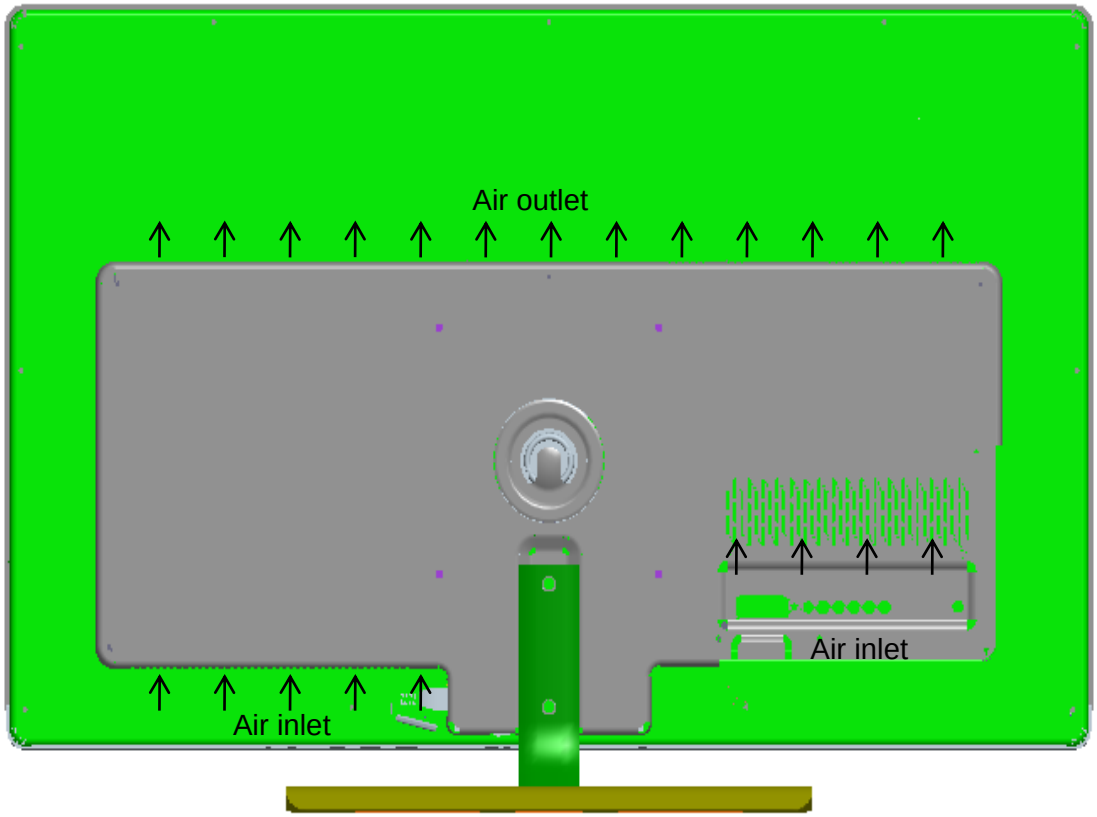
PHILIPS

Aluminium housing / RELIABILITY

- Small amount of cooling slots needed:
  - Good cooling properties
- Back display = back TV
  - Less parts
  - Less screws

Reliability tests

- Damp heat steady state
- Temperature step stress test
- Stress testing on complete product

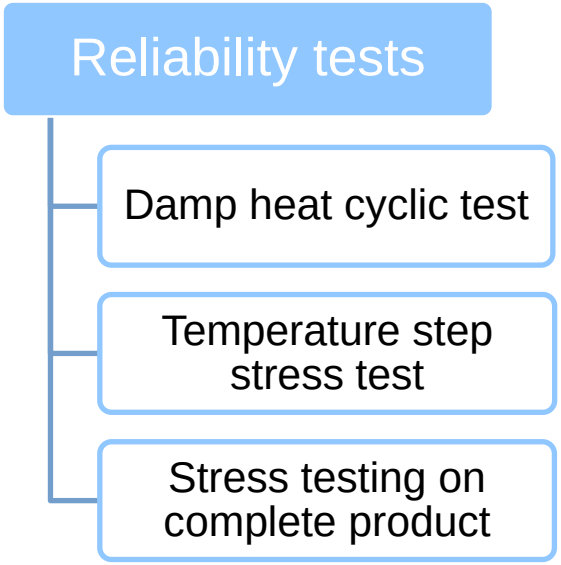


Components / RELIABILITY

- Less components
  - Higher reliability of total product

$$\lambda_{product} = \sum_{i=1}^{n} \lambda_{Component}$$

- Lower energy consumption
  - Lower temperature




PHILIPS