New solutions for a PV circular economy:

results from the H2020 projects CABRISS and ECOSOLAR

CABRISS

How to separate the components of end-of-life PV modules for further use

Wolfram Palitzsch, Loser Chemie GmbH

Why we deal with recycling technologies

1. Disposal problems have been the subject of specialist conferences in the industry for many years
2. Producers push for solutions (B2B calls)
3. Political constraints (EU directive WEEE)
4. Non-Chinese producers of specialty materials specifically ask for raw materials from recycling
5. Own offers, which contribute to the improvement of the resource efficiency of enterprises, immediately find acceptance on the market

But for many "waste" the technologies are missing ...

WP[1] – Objectives

- Objective 1.1

Collecting representative samples of PV wastes

(a) first and second generation of panels, ✓

(b) Si cells fractions, ✓

(c) Si water diluted slurries/sludge ✓

- Objective 1.2

Defining the most appropriate dismantling and extracting methods corresponding to the different sources of PV waste ✓

- Objective 1.3

Developing innovative cost-effective methods for the extraction of silver, indium, silicon… ✓

WP[1] – LOSER - latest challenges & solutions

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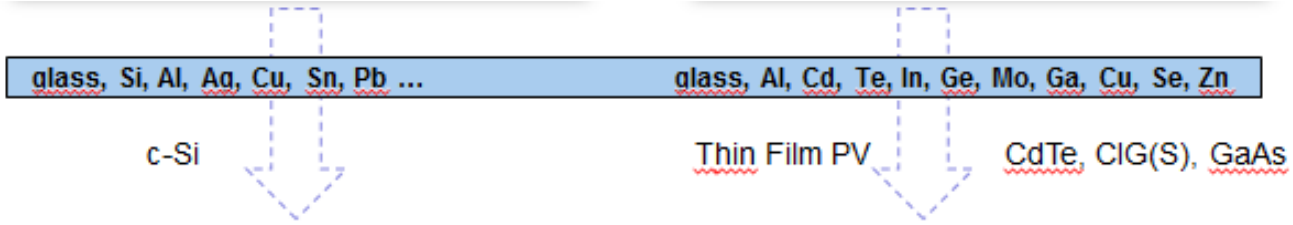
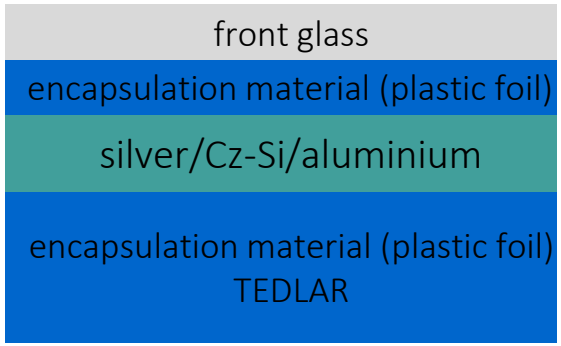
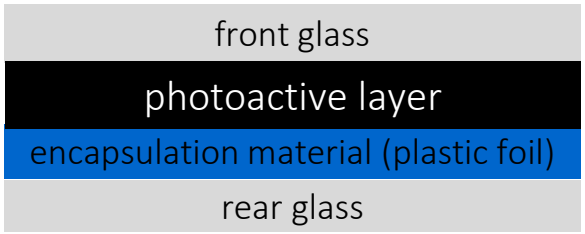


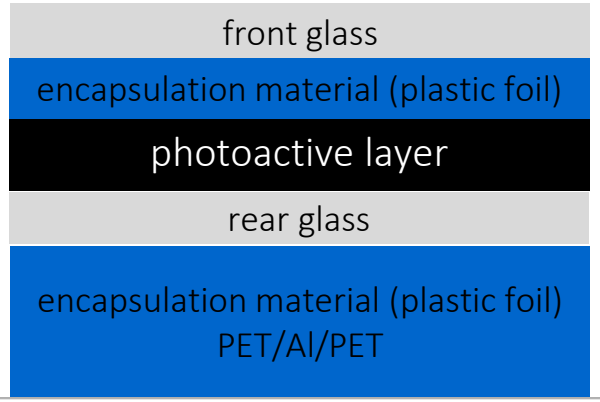


type 3

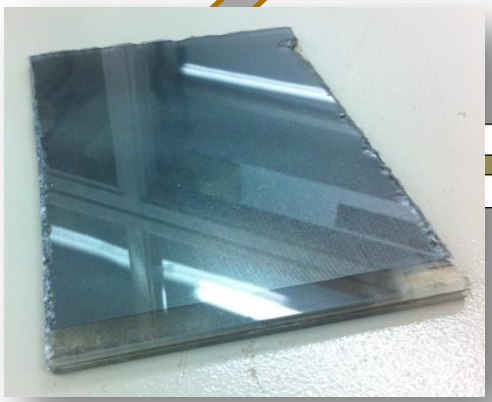
type 1

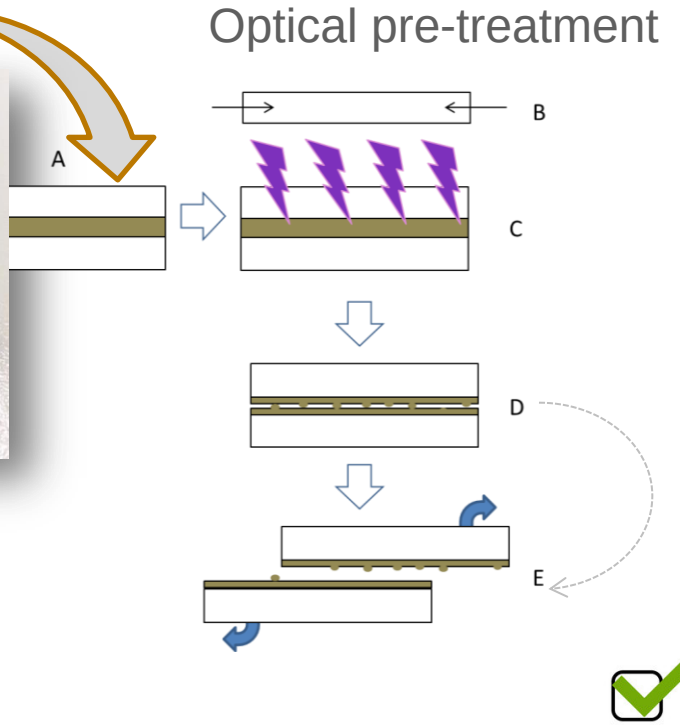


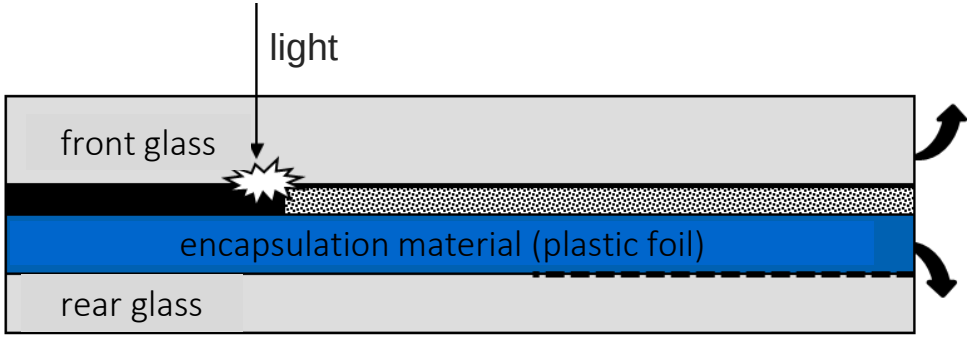
type 2



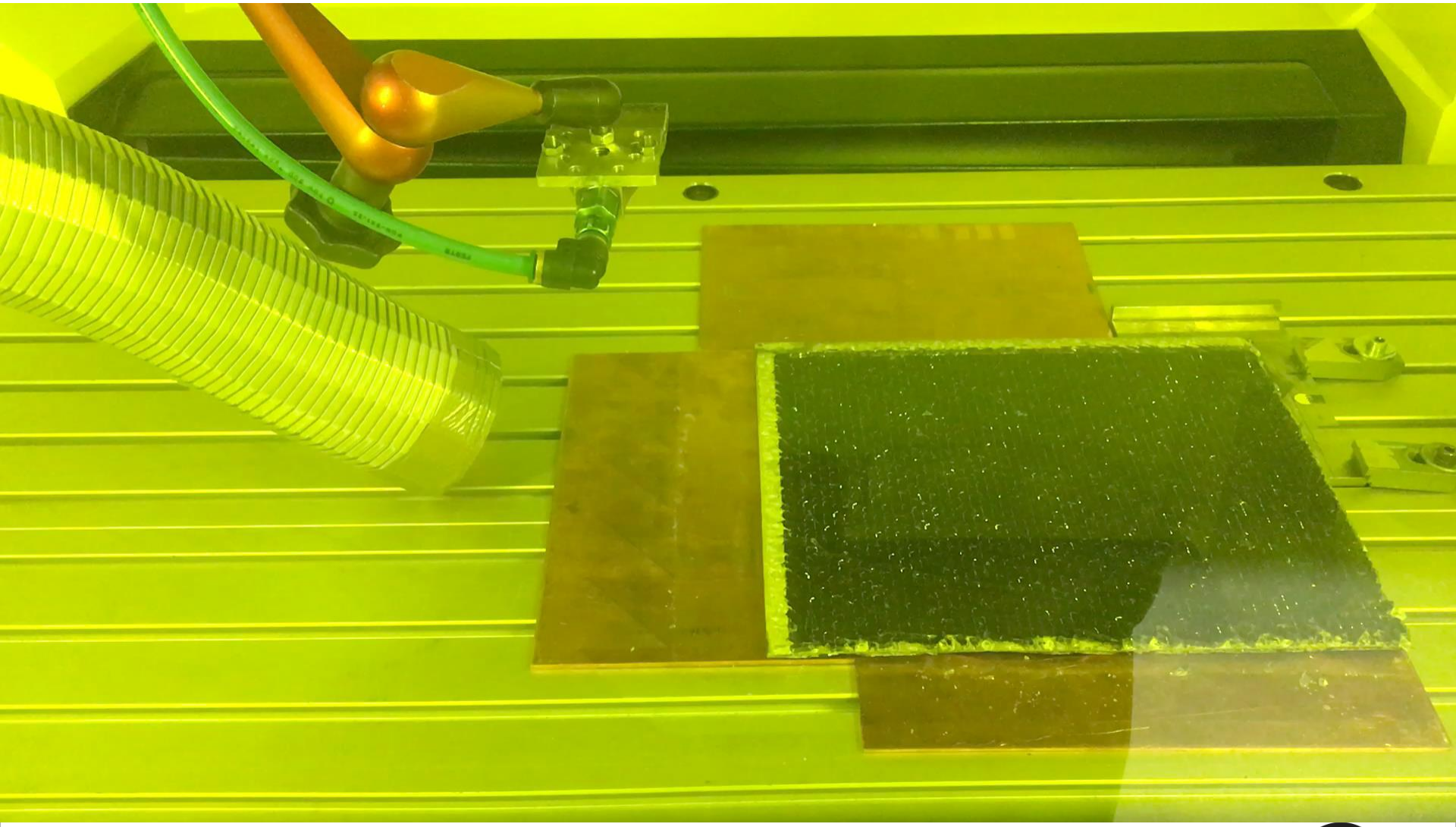
WP[1] – LOSER - latest challenges & solutions





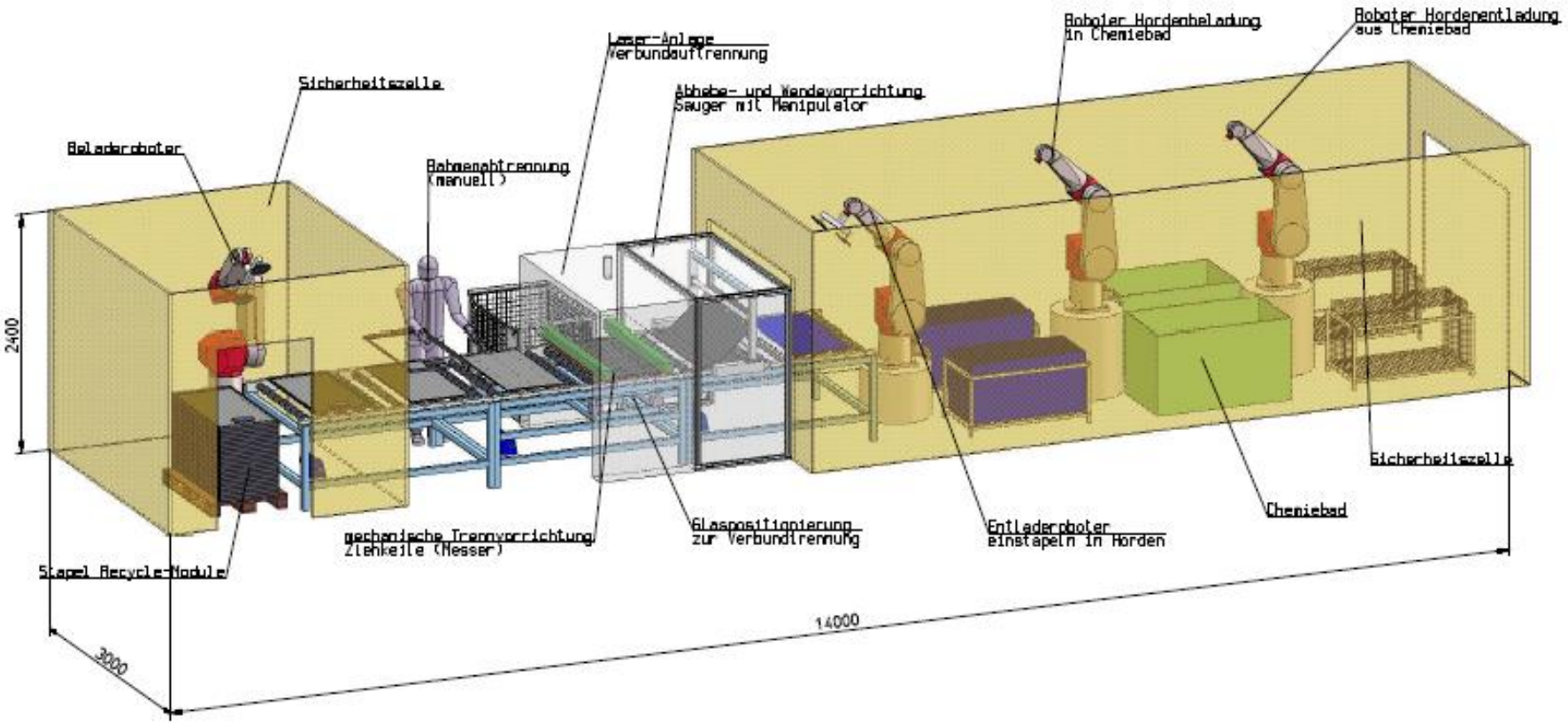


WP[1] – LOSER - latest challenges & solutions

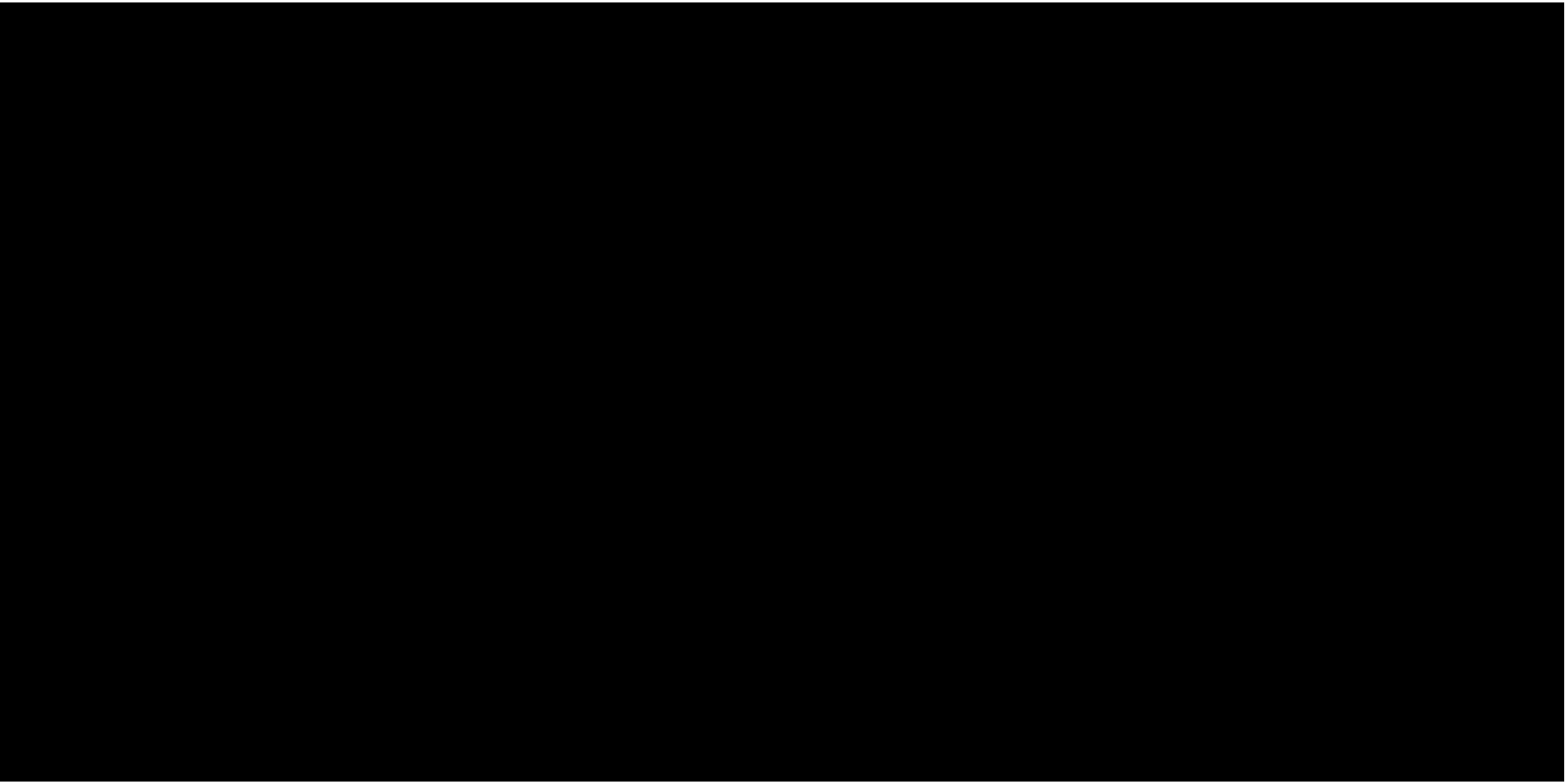


WP[1] – LOSER - latest challenges & solutions

A demonstration plant was needed
to produce enough materials for the other Cabriss partners !

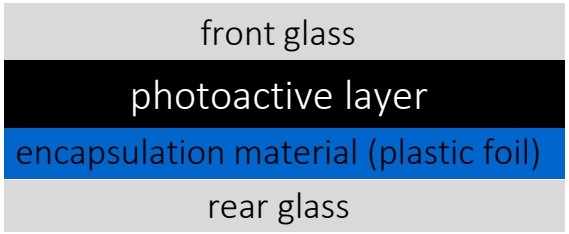


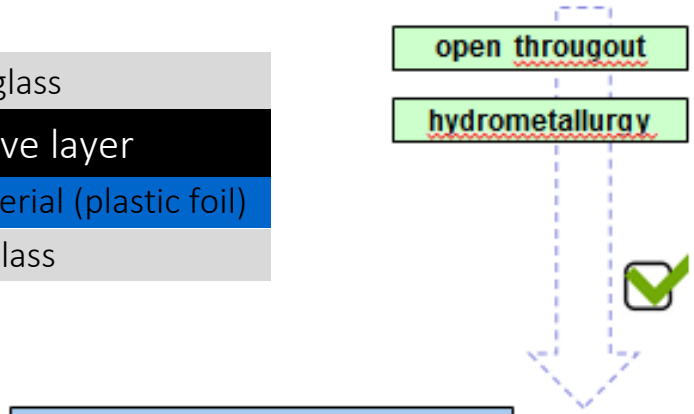
WP[1] – LOSER - latest challenges & solutions

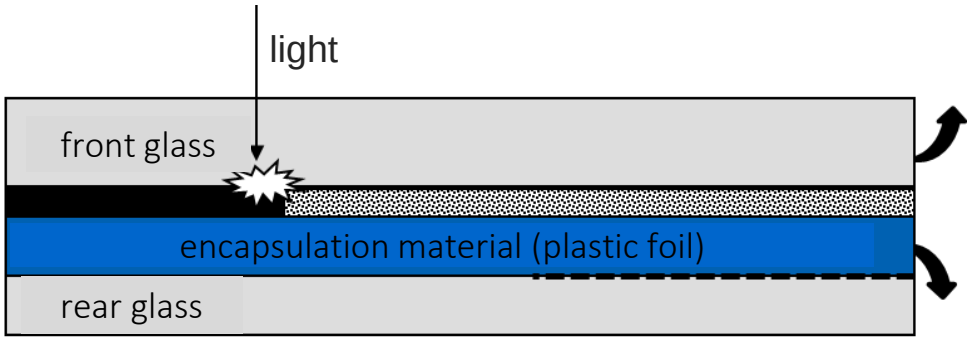


WP[1] – LOSER - latest challenges & solutions

type 1

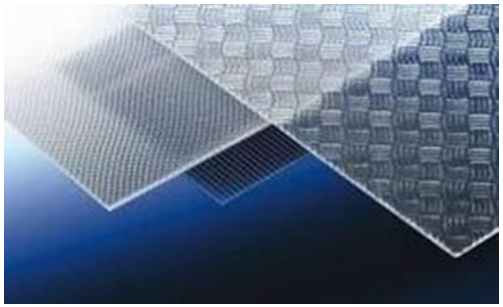




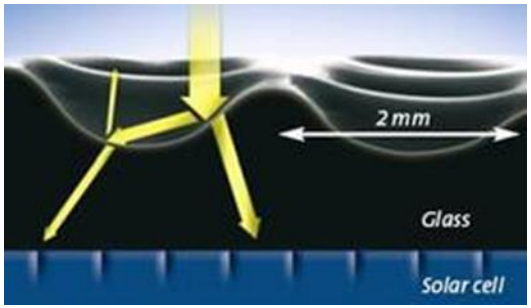


WP[1] – LOSER - latest challenges & solutions

But laser didn´t work for types 2 and 3, because of a special structure of solarglass !



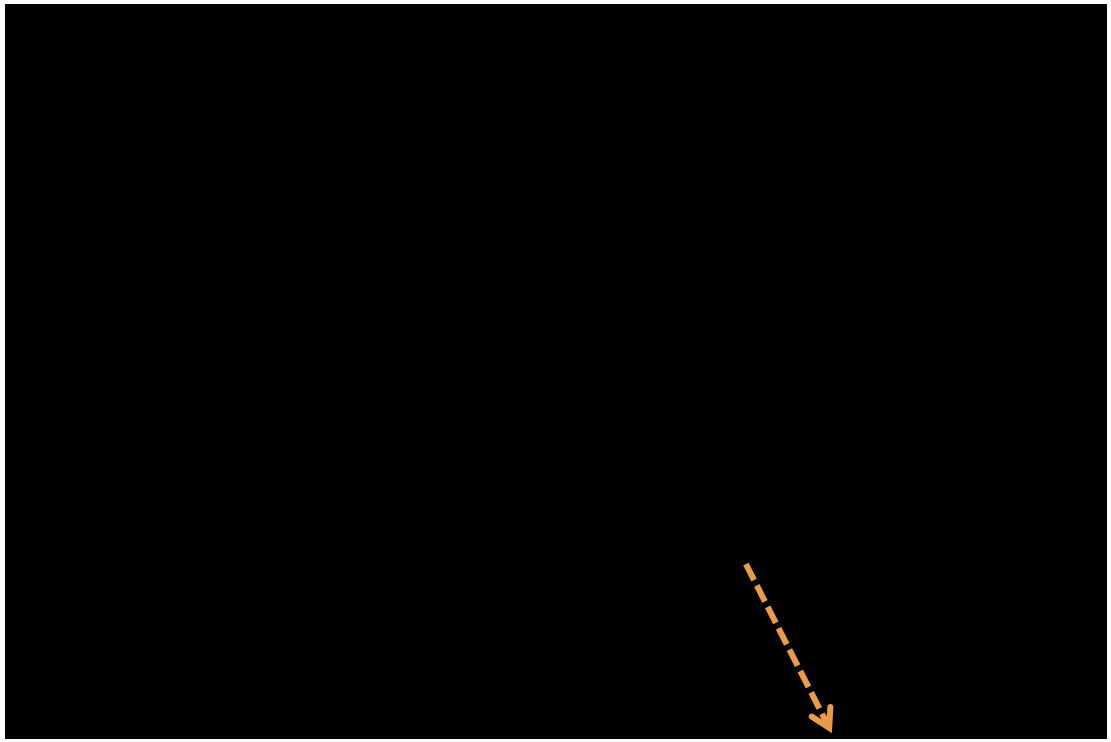
front glass
encapsulation material (plastic foil)
Silver/Cz-Si/aluminium
encapsulation material (plastic foil)
TEDLAR



front glass
encapsulation material (plastic foil)
photoactive layer
rear glass
encapsulation material (plastic foil)
PET/Al/PET

WP[1] – LOSER - latest challenges & solutions

But a special new technology helps to separate layers and to clean the glass:



front glass

encapsulation material (plastic foil)
TEDLAR

encapsulation material (plastic foil)
silver/c-Si/aluminium

WP[1] – LOSER - latest challenges & solutions

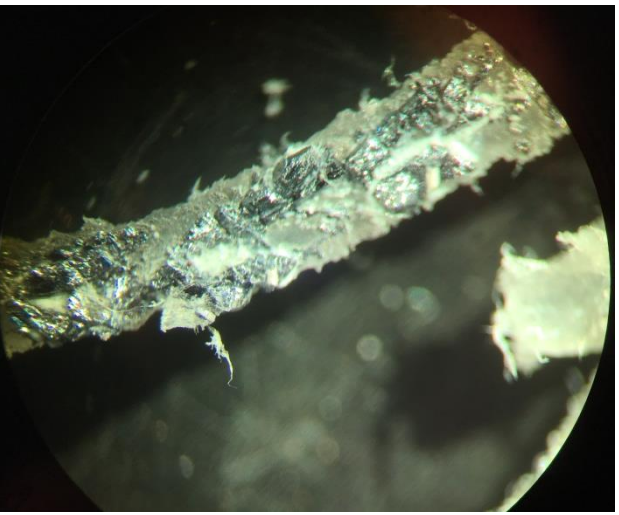
But a special new technology helps to separate layers and to clean the glass:

WP[1] – LOSER - latest challenges & solutions

encapsulation material (plastic foil)

silver/Cz-Si/aluminium

adding of a solution
of aluminiumchloride
and adding some water



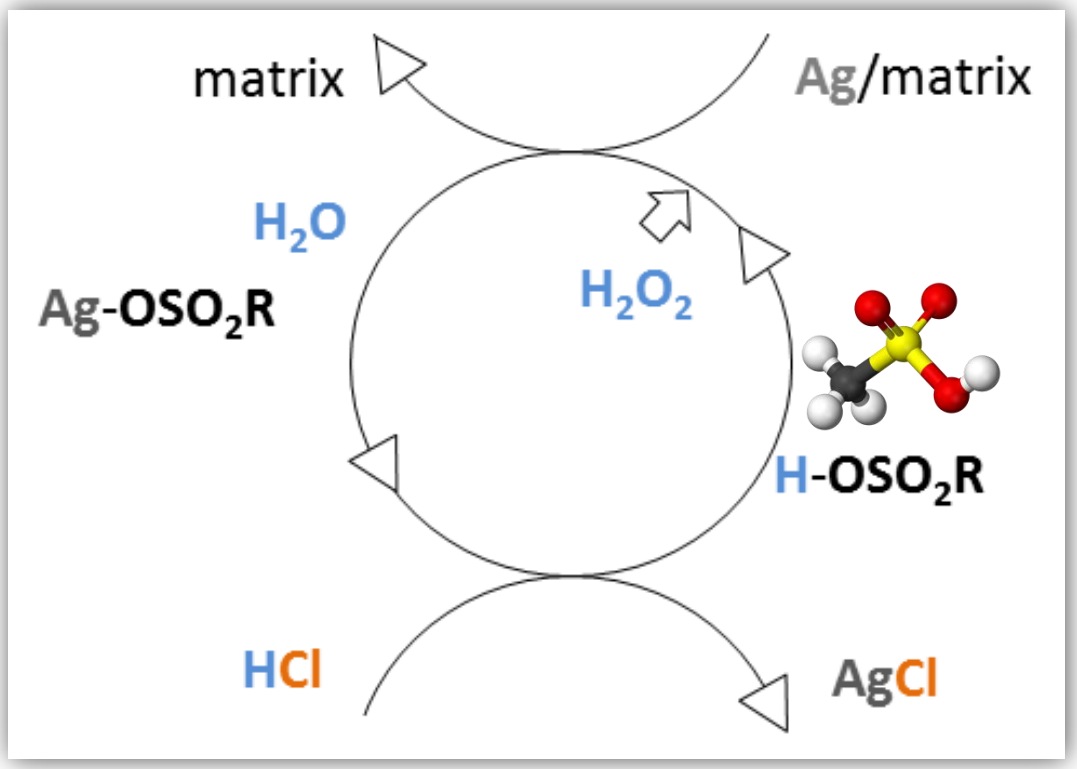
PAC usable for
waster water treatment

silver/Cz-Si

encapsulation material (plastic foil)

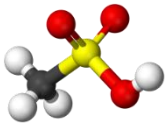
WP[1] – LOSER - latest challenges & solutions

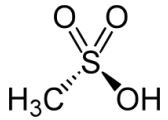
The separation of the silver follows the MSA-technology:



XRF check: 1.7 kg Ag / t

Methane-**S**ulfonic **A**cid





WP[1] – LOSER - latest challenges & solutions

What about the **type 2**.

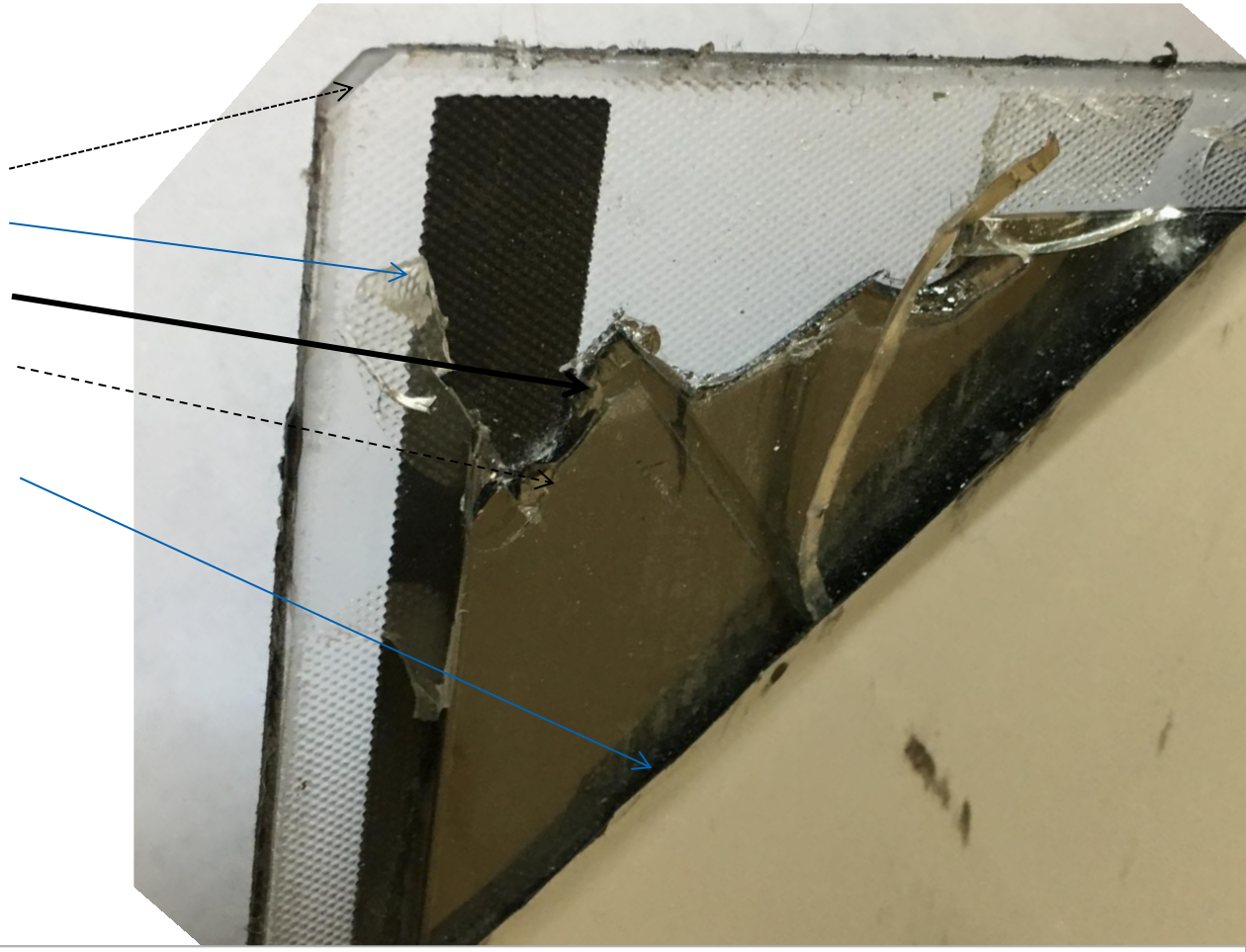
front glass

encapsulation material (plastic foil)

photoactive layer

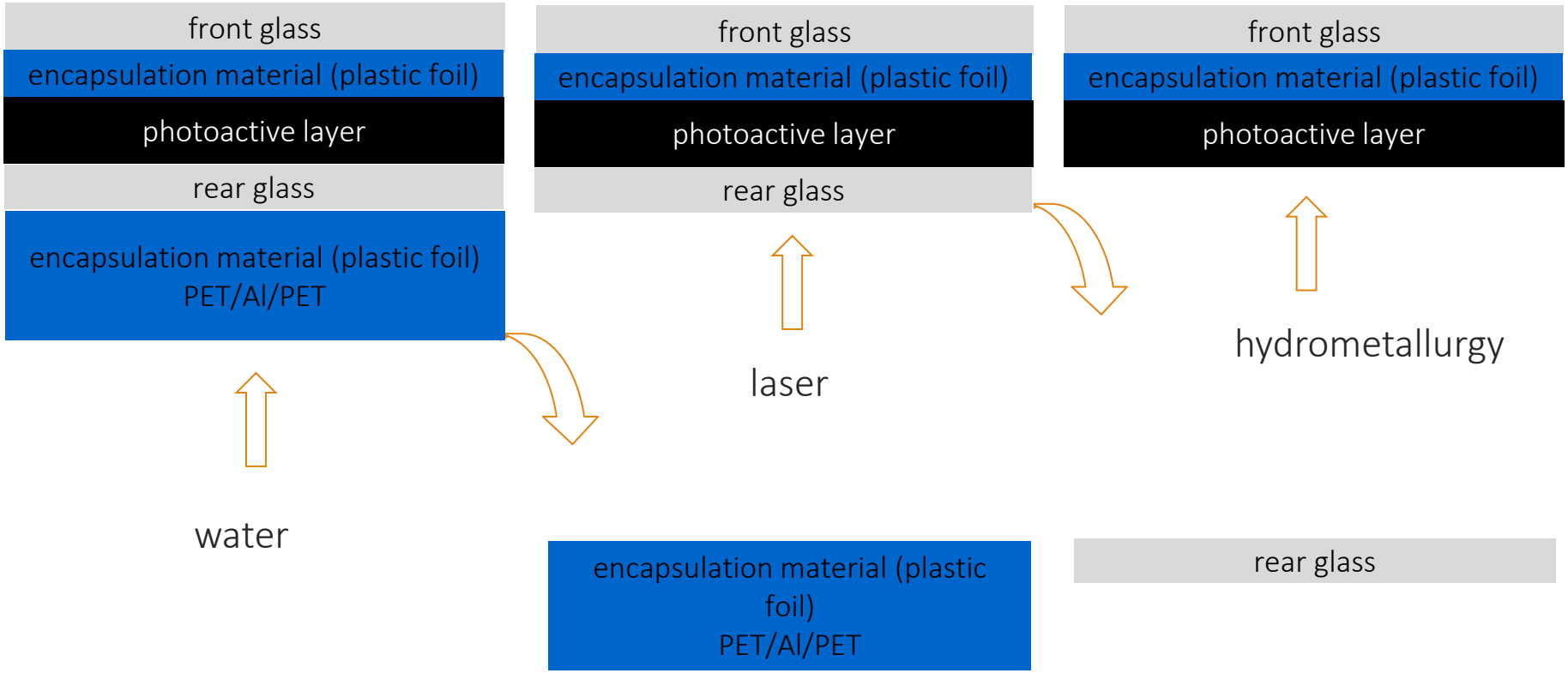
rear glass

encapsulation material (plastic foil)
PET/Al/PET



WP[1] – LOSER - latest challenges & solutions

The new technology helps also as pre-treatment to prepare **type 2** for laser…



Thank you !