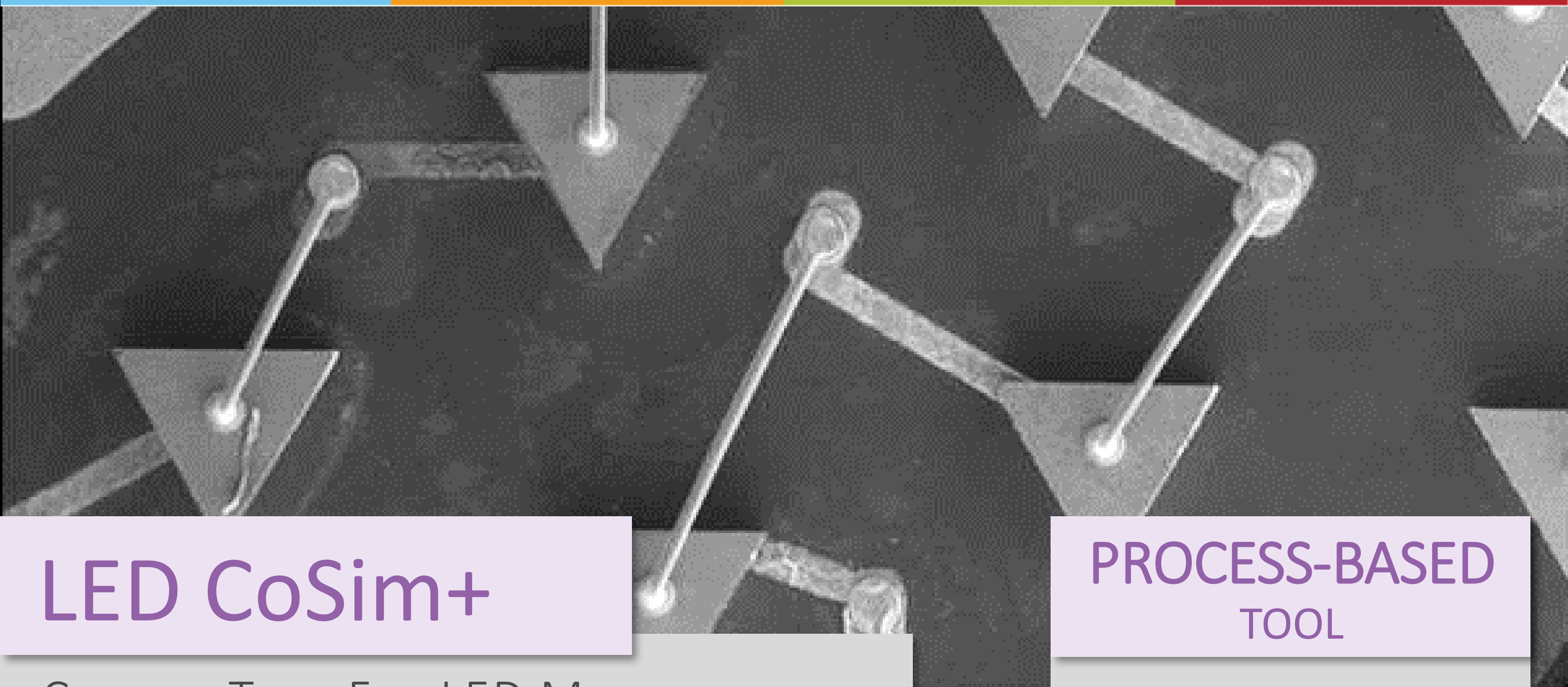
SYSTEM Plus CONSULTING

Reverse Costing & Technology Analysis **TOOL**



LED CoSim+

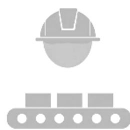
Costing Tool For LED Manufacturing

COMPLETE AND POWERFUL TOOL DESIGNED FOR THE LED COMMUNITY

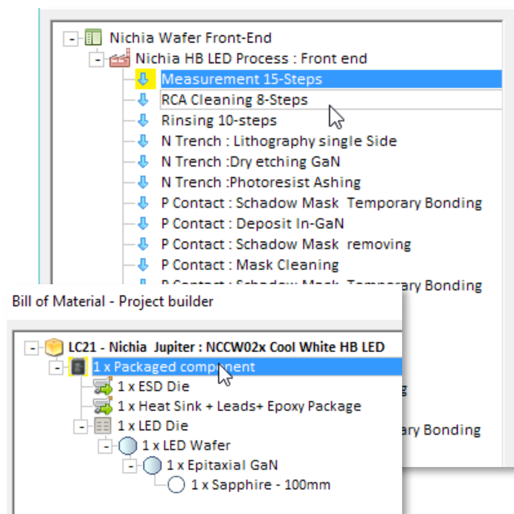
Due to their particular manufacturing processes, including GaN epitaxy and dedicated packaging, LED device costs can be difficult to estimate. Regular LEDs, High Brightness LEDs and Ultra High Brightness LEDs all involve very different process steps.

LED CoSim+ is a unique and very flexible tool for evaluating the cost of any LED process or component, already used by manufacturers and end users.

With the possibility of storing steps and process flows in libraries, this new version dramatically reduces the duration of the cost evaluation.



Step by step, describe your process flow to get a detailed manufacturing cost analysis.



PROCESS-BASED TOOL

Why do you need this tool?

- Optimize your manufacturing cost
- Challenge your own production / process choices
- Create a business plan
- Change your fab and process
- Evaluate economic feasibility
- Simulate your equipment's operating cost

Who should buy this tool?

- Marketing executives
- Process managers
- R&D engineers
- LED equipment suppliers
- Purchasing managers

LED TYPES

White
Color
UV
IR
Laser

PACKAGING

Phosphor Deposition
Ceramic, IMS
Leadframe Substrates
Flip-Chip, CSP
Molded Lens
etc.

SUBSTRATES

GaN on Sapphire
GaN on SiC
GaN on Silicon
GaN on GaN
GaAs
etc.

TECHNOLOGIES

Nichia
OSRAM
Lumileds
CREE
SETi
etc.

DATABASE

Equipment
Substrates
Materials
Wafer fab units
Assembly units
etc.

MAIN FEATURES

Describe the product

Add every process step

Enter the manufacturing location and supply chain

Calculate the manufacturing cost, compare up to 5 scenarios and choose improvements

Multiple process flows

Any LED process flow can be simulated with hierarchical description for multiple dies or processes, across an unlimited number of process steps or process flows.

Multiple conditions and supply chain

You can set up the tool with your own conditions, including location, clean room class, process type and subcontracting operation parameters.

Results are fully open-format

Modify or export final results, build reports with any Excel workbook.

Safely workgroup-compliant

Secure multiple access, data sharing and data integrity.

Support and updates available

Results Home page | Previous Results | Next Results | Previous Scenario | Next Scenario | Toggle display mode Year / Unit

Step Family	Process Sequence / Operation	Equipment	Yield	EQUIPMENT COST (USD / Wafer)	CLEAN ROOM COST (USD / Wafer)	LABOR COST (USD / Wafer)	CONSUMABLE COST (USD / Wafer)	TOTAL COST (USD / Wafer)	Active Equipment needs	Actual allocated Equipment	Equipment UpTime
screenshot Osram GaN on SiC Blue LED for New LED Wafer			96.7%	63.02	18.15	25.21	44.21	150.60	Optimal Mode 51733 Wafer / Year		
	OSRAM 50mm Epitaxy GaN on SiC Blue		**98.41%**	**34.68**	**10.36**	**8.14**	**33.86**	**87.05**			**<=80%**
Epitaxy	Epitaxy GaN : Bake-Out	GaN MOCVD Epitaxial Reactor	99.00%	7.63	2.29	1.79	1.74	**13.45**	1.089	1.361	80%
Epitaxy	Epitaxy GaN : Temperature Ramp	GaN MOCVD Epitaxial Reactor	99.90%	1.91	0.57	0.45	0.44	**3.36**	0.272	0.340	80%
Epitaxy	Epitaxy GaN : Nucleation Layer	GaN MOCVD Epitaxial Reactor	99.90%	5.72	1.71	1.35	1.30	**10.09**	0.816	1.021	80%
Epitaxy	Epitaxy GaN : Buffer layer	GaN MOCVD Epitaxial Reactor	99.90%	0.43	0.10	0.08	8.95	**9.57**	0.049	0.062	80%
Epitaxy	Epitaxy GaN : N layer	GaN MOCVD Epitaxial Reactor	99.90%	5.01	1.50	1.18	12.83	**20.52**	0.715	0.893	80%
Epitaxy	Epitaxy GaN : Active layer MQW	GaN MOCVD Epitaxial Reactor	99.90%	10.17	3.05	2.39	5.94	**21.55**	1.452	1.814	80%
Epitaxy	Epitaxy GaN : P layer	GaN MOCVD Epitaxial Reactor	99.90%	3.81	1.14	0.90	2.66	**8.52**	0.544	0.680	80%
	Osram GaN on SiC Blue LED : Front end		**98.22%**	**28.34**	**7.79**	**17.07**	**10.35**	**63.55**			**<=80%**
Cleaning	RCA Cleaning Multi-Steps	Wafer RCA Cleaning Bench	99.90%	0.92	0.92	0.91	0.59	**3.34**	0.525	0.657	80%
Cleaning	Rinsing Multi-steps	Wafer RCA Cleaning Bench	99.90%	0.16	0.16	0.19	0.00	**0.51**	0.090	0.112	80%
Measurement	Measurement Multi-Steps	Measurement : Generic equipment	99.90%	0.48	0.23	0.54	0.01	**1.26**	0.327	0.408	80%
Deposition	PVD-Titanium (Ti)	PVD Sputter Reactor	99.90%	0.90	0.18	0.67	0.26	**2.01**	0.256	0.320	80%
Lithography	Lithography single Side	Single side stepper	99.90%	0.70	0.09	0.43	0.23	**1.45**	0.100	0.125	80%
Etching	Wet Etching Titanium	Wet Etch Bench	99.90%	0.06	0.14	0.72	0.01	**0.93**	0.163	0.204	80%
Removal	Photoresist Ashing	PR Removal	99.90%	0.28	0.14	0.78	0.03	**1.23**	0.200	0.249	80%
Lithography	Lithography single Side	Single side stepper	99.90%	0.70	0.09	0.43	0.23	**1.45**	0.100	0.125	80%
Etching	Dry etching GaN	RIE Reactor - new range	99.90%	14.26	3.20	3.35	0.69	**21.50**	2.035	2.544	80%
Removal	Photoresist Ashing	PR Removal	99.90%	0.28	0.14	0.78	0.03	**1.23**	0.200	0.249	80%
Deposition	PECVD-Oxide	PECVD Reactor	99.90%	0.45	0.09	0.46	0.05	**1.04**	0.128	0.160	80%
Lithography	Lithography single Side	Single side stepper	99.90%	0.70	0.09	0.43	0.23	**1.45**	0.100	0.125	80%

CONTACT

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