

Award For TPM Excellence, Category A

1. Company, Plant/Factory Profile

1.1 About Owens Corning

Owens Corning is a publicly traded company on the New York Stock Exchange (NYSE: OC), the headquarter based in Toledo, Ohio, posted 2021 sales of \$8.5 billion and current employs about 19,000 people in 31 countries around world, founded in 1938, an industry leader in glass fiber insulation solutions business (ISB), Roofing and Asphalt (R&A), glass fiber Composites Solutions Business (CSB), has been on Fortune 500® list for 67 consecutive years.



Our products range from glass fiber used to reinforce composite materials for transportation, electronics, marine, infrastructure, wind-energy and other high-performance markets to insulation and roofing for residential, commercial and industrial applications. Now, OC has become a Broad-Based Company Recognition, we aspire to build market-leading businesses; global in scope - human in scale.



1.2 Sustainability in OC-TPM

At Owens Corning company, TPM is the way we drive our operation to ‘Zero’ – zero accident, zero defect, zero loss. This is what we call operation excellence. We introduce TPM since Y2012 in Composites Business, and in Y2017, made huge strides in launching and implementing TPM throughout 3 business.

1.3 About L’Ardoise Plant

Owens Corning L’Ardoise Plant started in 1972 with focus on fiber glass related products, mainly assembled roving. Its products: which nowadays also include Wet Used Chopped Strand have been exported to countries all over the world; with 95% of the products been sold in Europe. Products are mainly used in markets such as wind energy, automotive and building materials. The plant is recognized for ISO certifications in quality, safety and environment.





Plant Main Information

Occupied area	270000 m ²																																																											
Startup time	1972																																																											
Total headcount	290																																																											
Annual output capacity	96 ktons																																																											
Market distribution	Europe (95%)																																																											
Product application	Wind Energy, Pipe, Automotive, Tank, Boat, Electric equipment, etc.																																																											
Product range	<div style="text-align: center;"> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">65%</th> </tr> <tr> <th>Weighting</th> <th colspan="3">Sizing</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Product Mix</td> <td>111A/SE1200/WS2000/SE4850/R25H/PSS1000/PS4100/ST2070</td> <td>600 Tex 1200 Tex 1880 Tex 2400 Tex 3000 Tex 4800Tex 7000 Tex 9600 Tex</td> <td>15% 22% 4% 34% 2% 11% 4% 8%</td> </tr> <tr> <td></td> <td>Tex control LOI control Bobin Weight Packaging Bulk and Creel pack</td> <td></td> </tr> <tr> <td colspan="4">Main parameter:</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">35%</th> </tr> <tr> <th>Weighting</th> <th>Sizing</th> <th>Fiber diameter</th> <th>Cutting size</th> <th>%</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Product Mix</td> <td rowspan="5">777B/790C/WS2301</td> <td>6,5µ</td> <td></td> <td>3%</td> </tr> <tr> <td>10µ</td> <td></td> <td>32%</td> </tr> <tr> <td>11µ</td> <td>6 mm</td> <td>12%</td> </tr> <tr> <td>13 µ</td> <td>10 mm</td> <td>22%</td> </tr> <tr> <td>15µ</td> <td>13 mm</td> <td>30%</td> </tr> <tr> <td></td> <td>23µ</td> <td>18 mm</td> <td>1%</td> </tr> <tr> <td colspan="5">Main parameter:</td> </tr> <tr> <td colspan="5" style="text-align: center;">Fiber diameter Cutting size No long fiber LOI control</td> </tr> </tbody> </table>	65%				Weighting	Sizing			Product Mix	111A/SE1200/WS2000/SE4850/R25H/PSS1000/PS4100/ST2070	600 Tex 1200 Tex 1880 Tex 2400 Tex 3000 Tex 4800Tex 7000 Tex 9600 Tex	15% 22% 4% 34% 2% 11% 4% 8%		Tex control LOI control Bobin Weight Packaging Bulk and Creel pack		Main parameter:				35%				Weighting	Sizing	Fiber diameter	Cutting size	%	Product Mix	777B/790C/WS2301	6,5µ		3%	10µ		32%	11µ	6 mm	12%	13 µ	10 mm	22%	15µ	13 mm	30%		23µ	18 mm	1%	Main parameter:					Fiber diameter Cutting size No long fiber LOI control				
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Process technology	RM – Melt – Forming – Winding – Ovens – Packaging - FG																																																											
Major equipment	Glass furnace, Batch house, Bushing, Winder, Oven, etc.																																																											
Major achievements and recognitions	ISO 9001/14001/45001 certification; JIPM Excellence Award																																																											

2. Milestone on the Journey of Manufacturing Excellence

2.1 Why We Do TPM

With TPM program implementation, recognized through the Excellence Award, we have improved the results of our plant to reach our best performance level. TPM is our program to continue winning in our challenging situation:

- Europe is facing high inflation and instability, our cost control through loss eradication is critical.
- We are in a market with strong competition, the quality of our products is essential.

- Adoption of new technologies is critical for our company to get benefit of automation and digitalization.
- At Owens Corning, “our people and products are making the world a better place”. Making our Plant sustainable by reducing its environmental impact is critical.

With such challenges in front of us, we must have strong execution and discipline. TPM with strong pillars involves all our employees around our vision of our Plant “sustainably agile”.

TPM in L’Ardoise is our way of working to consistently improve our performance.

2.2 L’Ardoise Plant TPM Journey

L’Ardoise Plant is one of the biggest fiberglass plants in Europe. Two years after furnaces rebuilt, in 2016 the plant introduced TPM to achieve our competitiveness goals.

TPM journey started with a pilot in the winding area where Safety, Quality and Productivity losses were the highest in the plant.

We use TPM methodology to manage the plant with significant progress since 2016. In 2019 we drive all 8 pillars with all the employees deeply involved in TPM activities. The way of working changed. Pillar activities, loss elimination and cost management are part of the normal daily work.

In 2020, we received JIPM Award for Excellence, validating development of our employees through TPM. We continue to deepen our understanding and spreading methodologies throughout the plant. We have increased skills within the shifts, have improved our governance, and our operational results continue to progress. For the first time, we are now working on AM step 5 in the packaging.

We have achieved 0 accident in 2023 and reached best in class Net Efficiency level for our business with a performance over 93,3 % in 2023.

Now, we want to continue challenging ourselves to improve our cost position in the volatile environment we face. We want to expand our program to reach JIPM TPM Consistency Award with consistent application of TPM principles, methodologies, and tools.

3. Benefits Achieved

3.1 Tangible Results

Safety is a core value in Owens Corning organization, The engagement of the teams through hazards notification, PJHA, BBS, allow us to reach 0 accident in 2021 and to decrease our First aids number by 75%.

TPM elevated plant performance by improving equipment reliability and employees' competency. From 2016 to 2023, the NE (Overall plant net efficiency) increased by 5%, with a record in November at 93,7%.

We have made huge effort in cost management to reduce the impact of the inflation, integrating cost management in our Daily Management System. We have multiplied activities to reduce breakdowns and improve quality of the spare parts to use less of them, we have also adjusted consumable consumption to reduce waste.

Regarding defects rate, we hit record in Cost Of Non Quality, below 9\$ per Ktons of product, thanks to FI initiatives strongly maintained through Daily Management System.

3.2 Intangible Results

After Excellence Award, we consistently grew operators through AM step 4 and 5. Transfer of knowledge from PM specialist to AM team has been ensured through creation of training benches and jointly fixing of tags. Our operators are now able to share their knowledge to others Owens Corning plants in Europe, showing their engagement and motivation, but also outside the company, through local Operational Excellence Group from the region.

Since Excellence, shift leaders developed abilities to identify phenomena and eliminate losses: they are now able to lead FI activities like Quick Kaizen and QC story.

Strong governance of the Steering Committee allowed us to:

- Monitor and adjust Pillar activities to execute Plant Roadmap
- Develop strong coordination and collaboration between Pillars
- Drive elimination of losses with systematic approach.

4. Key of Manufacturing Excellence

Policy deployment is our process to define our goals and engage the team. It is a yearly process part of the governance of the steering committee of the Plant.

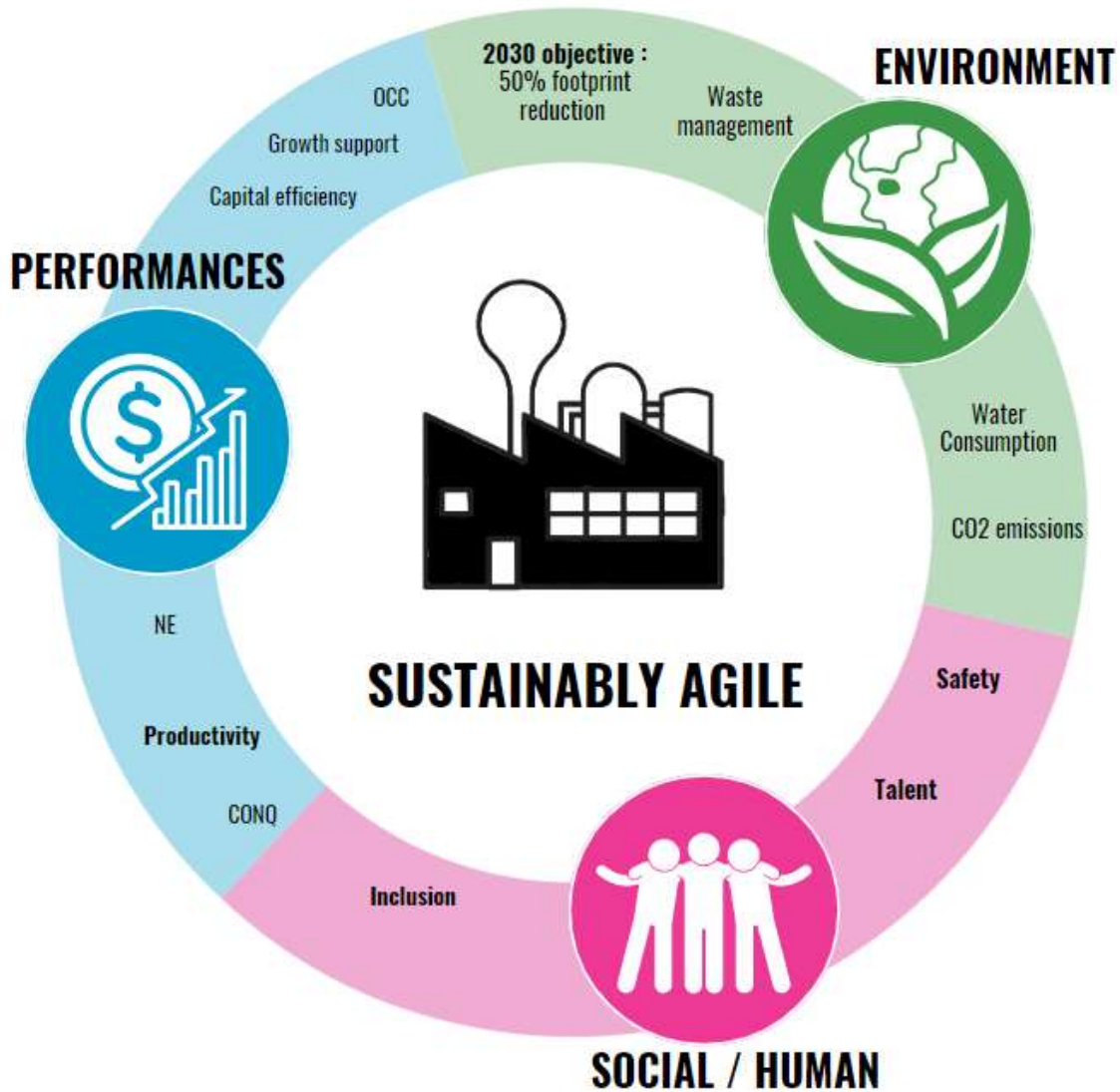
Based on Company strategy and expectations, we have defined our Vision Mission to win on the market. The Policy deployments allows us to translate Vision and Mission in indicators and activities for Pillars' teams to eliminate losses through projects and natural team to maintain through Daily Management System.

A strong loss identification process allows us to measure the gaps to our targets and to identify the proper initiatives to reach them. Cross functional teams are defined including natural team members to timely execute projects with Pillar support and accountability.

All employees are involved in the cascade of the Daily Management System to maintain performance and avoid any deviation to standard.

The strong governance through Steering Committee monitors and adjusts Pillar activities to ensure execution of Plant roadmap. The leadership team ensures strong presence on the shopfloor through Gemba to support employees in daily activities.

The leadership team of L'Ardoise plant is committed to implement TPM to a very high level and use TPM as the way to operate the Plant in order to improve cost position in the market, sustain and improve our operations and create the culture and working environment change needed to reach zero accidents, zero quality defects and zero loss.



We refresh our vision with the team, we target to make our **Plant sustainably agile**. We work on 3 mains axis: Performance / Environment / Social and Human.



<p>OC vision and mission</p>	<p>To build a sustainable future through material innovation</p> <ol style="list-style-type: none"> 1. Strengthen position in core products & markets 2. Expand our multimaterial system offering 3. Develop prefabricated & modular construction solutions 					
<p>L'Ardoise plant vision and mission</p>	<p>Vision: Sustainably Agile</p> <p>Missions:</p> <ol style="list-style-type: none"> 1. Social/human: develop talent, increase Inclusion & Diversity, Eliminate safety risks 2. Environment: reduce our footprint by reducing CO2 emission, Water consumption and improve waste management 3. Performance: improve cost management, improve productivity and Net Efficiency 					
<p>Plant objectives</p>	<p>Safety</p>	<p>Quality</p>	<p>Performance</p>	<p>Cost</p>	<p>Sustainability</p>	<p>Human</p>
<p>KPI/KAI (some)</p>	<p>Recordable First aid Near miss</p>	<p>Customer Complaint Repetitive Complaint IFR</p>	<p>NE% JE% CE% Breakdowns</p>	<p>Other Cash Cost Unit Cost Financial Productivity Project savings</p>	<p>Water & Energy consumption Glass landfill to CO2 emission</p>	<p>Skills gap Woman in Operation Absenteeism Operational Survey</p>



Pillar	AM Pillar	PM pillar	FI pillar	T&D Pillar
approach and activities	<p>Equipment running at optimal conditions with no Safety or Q losses</p> <p>Deployment AM activity in areas.</p> <p>AM upskilling of operators</p> <p>Increase abilities to find and solve abnormalities.</p> <p>Blitz approach to eliminate abnormalities</p>	<p>Zero breakdown through maintenance strategy and skills improvements</p> <p>PM Operators upskilling</p> <p>Improving the maintenance indicators through breakdowns and cost reduction</p> <p>Train AM team through AM Step 4</p> <p>Restore equipment's</p>	<p>“Zero Loss” mindset</p> <p>Improve performance through projects</p> <p>Develop loss trees through pillars</p> <p>Improve loss elimination through upskilling of the team</p> <p>Develop FI skills in natural team</p> <p>Develop and train advance methodologies and tools</p> <p>Drive Policy Deployment process with OA pillar</p>	<p>Provide knowledge and skills to work efficiently and eliminate losses</p> <p>Set of skill matrix/practices to identify the right skills to the right person and the right time</p> <p>Measure losses due to lack of skills</p> <p>Manage skills matrices</p>
Pillar	QM Pillar	EHS Pillar	OA Pillar	EM Pillar
approach and activities	<p>Eliminate external or internal defects</p> <p>Our product and service meet our customer's exact requirement</p> <p>Our process is capable and consistent.</p> <p>Develop QA/QX and QM matrices</p>	<p>“Zero incident” Everyone takes care of their own safety and safety of colleagues as being injured at the job is unacceptable.</p> <p>Create a safe workplace by developing a safety culture. We believe every accident is preventable</p>	<p>“Zero administrative Losses” through 5S and office TPM methodology</p> <p>Create a structured approach to search for and eliminate administrative losses.</p> <p>Drive Policy deployment</p>	<p>“Vertical Start-up” for all product and Equipment.</p> <p>Deliver new products meeting both customers and internal Business indicators</p> <p>Product and process development management process</p>



	Through AM Steps Our people have the skills and commitment to ensure quality for our customers	Develop tools in natural team: PJHA, BBS, safety walk	process with FI pillar Support PM to reduce cost of the spare parts Deploy TPM in supply chain	Create standards to use methodologies in a systemic way.
Governance	Steering committee	Pillar meeting	Huddle Daily Management System	Gemba
	Weekly	Weekly	Shift to daily	Daily

5. Achievement Record

Company & plant name	Owens Corning Fiberglass France Co., Ltd.
TPM Slogan/Objectives	Identify, Analyze and Eliminate All Losses.

Category	Index (Calculation Formula)	Unit	Kick off/ TPM Started	2023	Target 2024	JIPM Use
S	Number of work-related accidents requiring days off work	Cases/ annually	5	0	0	
S	Number of work-related accidents not requiring days off work	Cases/ annually	126	24	20	
P	Productivity for main products	(Kg/hour)	242.5	235,8	248,7	
P	OEE (or Overall Plant Efficiency)	%	89.7	93,3	93,6	
M	Number of tags raised	Number	1221	21906	25200	
P	Number of breakdowns	Breakdowns/ annually	2160	36	60	
Q	Number of customer complaints	Number/Tons	0.22	0.25	0.3	
Q	In-line defect rate	Scrap	%	4.2	3.5	3.4
C	Cost index	Cost/Unit Cost/Kilogram	1	1.12	1.2	
D	Lead time in days	Days	8	7.5	7.5	



D	Delivery performance	%	92.8	92.8	93	
S	Safety index	Accidents per 100,000 operator hours	9.56	0	0	
M	Number of Employee Suggestions	Number/ Year	/	3608	3800	
Other	<p><Specify achievements not expressible in numerical terms></p> <p>1. Do you have a program where all employees can participate in TPM? Yes. All employees participate in the TPM program, through activities such as:</p> <ul style="list-style-type: none"> • Daily AM activities (Cleaning, Inspection, Tagging, OPL) • Losses elimination through Project/Kaizen activities • Daily Management System (Huddle) • Training other on Shopfloor or training centre • Weekly 5S activities <p>2. Do you have a program allowing employees to be recognized their achievements? Yes</p> <ul style="list-style-type: none"> • Quarterly incentive program to recognize collective achievements linked to SQDC KPI's • Each Trimester, bonus for the 3 best tags related to safety <p>3. Are top management involved in the audit/verification of completion of TPM pillar steps? Yes</p> <ul style="list-style-type: none"> • LPA Process audit and daily Gemba system (AM/5S/FI project/Safety) • AM Step audit performed by AM groups and Step Change Validate by Steering Committee Audit • OC Internal Assessment team audit, to check TPM progress, once a year, with OC TPM assessment standard <p>4. Are all pillar activity boards displayed and reviewed by top management? Yes. L'Ardoise Plant activity boards are displayed on the shop floor, owned by activity group and reviewed by Pillar Team Members.</p>					