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Gauzy Ltd. a new industrial development approach in PDLC technology

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KEYWORDS

PDLC; gauzy; LCG; business model; LTE

Introduction

During the past three decades, the industrial development and commercialisation of Polymer Dispersed Liquid Crystal (PDLC) technology has been in continuous evolution worldwide. In this period, when the industrial evolution of the field has been the subject of cycles of progresses and setbacks, it has witnessed the appearance and disappearance of many PDLC film and glass producers. Currently, there are over 15 PDLC film manufacturers and many more glass suppliers worldwide, creating a business turnover of more than \$360million.

During the first two decades, the global growth of the field had not been according to much anticipation. Only the past decade has witnessed a surge of worldwide demand and rapid growth. The most important factors responsible for the slow industrial growth of PDLC technology during the early development period had been the price, patent and, most of all, the business strategy of PDLC film producers. The details of the evolution history and market status of PDLC technology have been reported elsewhere [1,2].

The business models of the current PDLC film producers are either based on: a) the sales of film products to the glass processors without any transformation or installation knowledge and involvement to the final PDLC glass product or b) those who are also producing PDLC glass in-house, approach the end-use market alone. Besides these traditional business models, we identified a newcomer in the field with a different business model, namely Gauzy Ltd., which is briefly dealt with in the report.

Gauzy profile

Gauzy Ltd. is a new start-up company, which had been first founded in 2009 and since 2014, began development, manufacturing, and commercialisation of PDLC

film and glass technology. The company headquarters is in Israel and its main offices in Germany and the USA. During the past 4 years, Gauzy has consolidated its worldwide business in Europe, the USA, South America, Canada, China, Singapore, Australia, and the Middle-East.

Gauzy owns and operates the state-of-the-art R&D and manufacturing facilities and its innovative products are embedded in many top brand installations through its worldwide partnership networks. Until now, Gauzy has invested over \$11 million in its R&D laboratory, manufacturing facilities, sales, marketing and business infrastructure. The company is in continuous expansion and currently has over 50 employees worldwide, including R&D, manufacturing & operation, marketing & sales management and administration.

Gauzy develops, manufactures and commercialises diverse LCG® brand products through its worldwide glass partners for various applications and in diversified markets, including construction, automotive, energy, electronics, appliances, hospitality, healthcare, entertainment, retail and more.

Gauzy business model

The three decades' industrial evolution on PDLC technology has witnessed cycles of progress and setback, which had caused a drastic change in the global landscape of this field. This change has resulted in replacing few large corporates with numerous small PDLC film manufacturers that currently dominate and indirectly affect the worldwide PDLC glass businesses.

During its initial industrial development period, from the late 1980s and early 1990s, few large companies took the lead on technology according to a common business model based on manufacturing and commercialising single mass PDLC film and glass products for the exclusively switchable privacy market.

Following the setback period in the late 1990s that had been triggered by patent litigation, high price, over-estimated market forecasts and unrealistic business model, the major large players had phased out their industrial PDLC activities. During the revival period since the early 2000s, the industrial activities in the field had been gradually dominated by many small players.

During the past decade, due to limited investments and an unrealistic business approach, the small players in the field have not been able to contribute to the growing market demands and anticipated global expansion of the PDLC business. The lack of strategic partnerships, proper market access, and supply chain, as well as the competitive technologies, have resulted in that the current PDLC global market share is only 14% of the total 'smart glass' [2]

Although recently some PDLC film producers gradually began to introduce other versions of the same product, such as coloured, retrofit, projection screen films to their product portfolio, these are mainly variations of the same PDLC products. In addition, the implication of traditional business model has shown to be incapable to diversify PDLC technology and products to other potentially larger demanding markets.

To overcome the abovementioned limitations, Gauzy has implemented a new business model based on the integration of upstream R&D, product diversification and manufacturing with downstream commercialisation and

business promotion through glass processor and end-use partners. This business model has provided the opportunity to create and control a sustainable supply chain and direct access to both traditional and larger emerging markets worldwide.

Among the issues that construct Gauzy's new business model, here we only provide a brief account of two of the most important factors of Upstream Innovation and Downstream Partnership:

Upstream innovation

The Gauzy's technology innovations and manufacturing of diversified new products are the key upstream factors in Gauzy's business model. These factors are integrated to downstream commercialisation, not only for traditional privacy market but also for wider emerging applications in construction, transportation, energy, entertainment and display markets.

Although PDLC is Gauzy's core-business technology, its multidisciplinary R&D team has been also developing new liquid crystal technologies and products, such as Polymer-Stabilised Liquid Crystal (PSLC) based on smectic and cholesteric materials, as well as the newly licensed Suspended Particle Dispersion (SPD) technology.

Accordingly, Gauzy is developing a vast family of new generations of patented chromogenic technologies and products, among which are PDLC white, coloured and



Figure 1. Gauzy roll-to-roll PDLC film manufacturing line.



Figure 2. Gauzy LCG Product categories.



Figure 3. Gauzy electrical controllers.



Figure 4. Gauzy ATE System

patterned films, static and dynamic solar-control films, bi-stable and direct glazing films, and active and passive projection screens. The currently commercialised PDLC film products are described in the company's product section website [3].

Following the product scale-up and qualification, the new products are manufactured by a state-of-the-art and multifunctional roll-to-roll system with the capability of maximum roll width of 1.8 m in sheet, roll and cut-to-fit formats (Figure 1). Gauzy's developed and manufactured film and glass products are protected by a corresponding patent profile, which includes all LC technologies for privacy, solar control, and projection screen with online and off-line processes.

Gauzy has also embedded the knowhow of glass lamination of its LCG brand products for privacy, light and heat control, projection, and smart display applications. The company provides complete end-to-end solution services for delivery of ultra-low haze, low energy consumption, high transmittance, fast switching times, and highest optical performance of final LCG® products to the worldwide markets (Figure 2).

In addition, the company is also manufacturing its own patented electrical controller technology of Flex and MultiPlex modules (Figure 3) for on-off and dimming drive of all kinds and sizes for high-quality performance LCG® product range.

Last but not the least, Gauzy is consolidating her inventions through a strong portfolio of intellectual property rights (IPR), including 18 filed material and process patents in various stages of registration in the USA, EU, China, India, Brazil, and Israel. The company also has 12 utility models in various stages of registration in Germany and Japan.

Downstream partnership

Partnership with downstream global glass processors, fabricators, and installers is another key factor of Gauzy's new business model. The integration of this factor in company's strategy has allowed Gauzy with a unique opportunity to quickly expand her commercial and business activities worldwide. Through the partnership with local selected partners around the world, Gauzy provides a training, certification and turnkey program to its glass processors and installers on lamination, test, QC, and installation of LCG® product for end-use application.

The downstream partners are carefully selected, undergo extensive on-site training and receive the tools necessary to guarantee the verification and installation process of LCG® before and after glazing. Accordingly, Gauzy has developed and manufactured a unique proprietary Automatic Testing Equipment (ATE) to assist its partners for testing and qualification of LCG® before and after lamination and installation, to

ensure a plug and play process and warrant the final installed LCG® product.

ATE is fully equipped with software, hardware, optical and visual evaluation tools, which provides a complete solution to the most important parameters of LCG® fabrication and installation. The advanced and easy-to-use ATE guarantees the fabrication process and ensures the production of high-quality LCG® products for diverse end-use clients (Figure 4).

The partnership strategy through advanced training of partners with the ATE system has allowed partners to expand their business portfolio and confidence, which in turn, has provided both Gauzy and partners to expand their business rapidly in diverse worldwide markets and to stand out against competitions.

Conclusion

In this report, we presented the new business approach by Gauzy Ltd. on industrial development of PDLC film

and glass technology. We briefly described the company's business model and its advantages over the traditional strategy that are being practiced by others in the field. Upon its full implication, this business model seems to be the most appropriate approach to furthering the global expansion of business of PDLC technology.

Disclosure statement

No potential conflict of interest was reported by the author.

References

- [1] Hakemi H. Industrial development of plastic PDLC: is there a future? *Liquid Crystals Today*. 1998;8(3):7–12.
- [2] Hakemi H. Polymer-dispersed liquid crystal technology - industrial evolution & current market situation. *Liquid Crystals Today*. 2017;26(3):70–73.
- [3] Gauzy General Overview. [cited 2018 Jan 30]. Available from: <http://gauzy.com/pdlc.html>