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## **Productive Draping: The Making of and Research Behind The Performative Curtaining Project**

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# Productive Drapery: The Making of and Research Behind *The Performative Curtaining Project*

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The Productive Drapery project is a multidisciplinary investigation intended to correct architecture and create better interiors. Historically drapery has been utilized to block and filter light, provide privacy, and mend construction to minimize drafts. Picture windows, popular in American mid-century tract homes, caused drapery to be utilized to further “right” architecture. They were situated for exterior symmetry, but generated difficult to inhabit imbalanced interiors, wall to wall curtaining was implemented as a correction. Contemporary urban glass towers, with floor to ceiling glazing, have further exacerbated this problem. The task of Productive Drapery, unlike Petra Blaisse’s spatial curtaining for the site-specific and spectacle, is to address and rectify quotidian interior issues in multiple conditions. Those caused by large expanses of glass as well as obstructions created by HVAC elements found in more typical construction.

We continue to develop a taxonomy of conditions that address the pragmatics of drapery via analogue and digital methods. This praxis research is an extension of the theoretical inquiries found in the expanding body of knowledge for Interior Design. Through the manipulation of prototypes, we test pedestrian ideas of domesticity and create new textile based interiors. Fabrication methods encompass, hand sewing, machine sewing, smocking, folding, pleating, and embroidery. Materials include, various textiles including, woven, knit, and felted as well as conductive thread, thin film photovoltaic and smart textile assemblies.

The Productive Drapery prototypes provide context for window treatment beyond the decorative, adapting to frame views, compressing and expanding to meet changing spatial and climatic conditions. Illuminating Curtaining’s historically performative role also questions issues of home goods consumption. In combining the tasks of decorative objects; lights/curtains, picture frames/curtains, these prototypes provide an edited cohesive environment extending the definition of interiority and human habitation.

Additional Key Words and Phrases: Textile, Textile History, Interior Design, Interior Architecture, Architecture, Design History, Interior Design History, Architectural History

## 1 INTRODUCTION

The curtain, with its inherent transformability is proving capable of bridging the great schism between architecture and interior design through a capability to generate more habitable environments. The divide between architecture and interior has been recognized since the 18<sup>th</sup> century when upholsterers and architects diverged in their appreciation for the hard verses the soft and the permanent verses the impermanent. The disciplines eventually grew even further apart with the emergence of the professional interior designer in the 19<sup>th</sup> century where architects felt that their well-articulated spaces were corrupted by the hand of the upholsterer or decorator. The design of the interior had arguably been subjugated to that of architecture even by some of its greatest proponents including Edith Wharton and Ogden Codman Jr., who preference the design of the architecture to that of the interior [1].

A recent surge in interior design scholarship and a growing body of knowledge has begun to remedy the inferior station of the interior and embrace its temporal quality with its ability to connect to the inhabitants and to mediate space seasonally [2-8]. Both Joel Sanders and Lois Weinthal address curtaining, from differing stances, as a means to better connect the professions; Sanders does so figuratively and Weinthal more literally. Both point to the ability of the curtain to have more responsibility than merely the decorative. According to Sanders, “Whether rigid or malleable, found on the inside or the outside, the surfaces of our buildings work like the clothing that covers our bodies; both are coded to enable us to articulate the various identities that we assume every day [9].” Weinthal contends that curtains provide a transformative quality to architecture, allowing inhabitants to customize light, temperature, and adjust boundaries, resulting in a potential reconsideration of the professional boundaries between architecture and interior design [10].

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## 2 ISSUE AND CONTEXT

*The Performative Curtaining Project* is a multidisciplinary investigation that intends to work in collaboration with architecture in order to generate better interiors. Historically, curtains have been understood to block and filter light, provide privacy, and to mend construction by blocking gaps hence minimizing drafts [11]. The history of curtains and their relationship to the cultural constructs of the interior is surprisingly limited. Designer Thomas Jayne puts forward a summation of the history of curtains in the introduction of *The Well-Dressed Window: Curtains at Winterthur*:

“... that textiles in general were extremely expensive, appearing in probate inventories along with silver as the most valuable tangibles in the house. Fabric was so expensive that it was not used on windows until the seventeenth century, when new production methods allowed the wealthy to have curtains in select locations. The first were single flat panels only as large as the size of the opening, and they pulled to just one side. later in the century, modish people made the panels in two pieces, or pairs. In the eighteenth centuries, curtains became more elaborate as fabric became less expensive. Their wide adoption, however, was slow, only the wealthy had notable curtains until well into the 1800’s [12].”

### 2.1 The Curtain and Interiority

Curtains have a well-articulated history of performative application and have not been not limited to the covering of windows. The notion that curtains are performative and not merely decorative or a demonstration of wealth and societal position is articulated by F. A. Moreland, in his book *Practical Decorative Upholstery* [13]. He describes a textile application, rather than hardwood, for residential interior doors. Moreland purports that interior door curtains “allow a freer circulation of air and more even temperature throughout the house”. In *Culture of Comfort*, Katherine Grier cites the invention of the door curtain or portieres and heavy window draperies in the Victorian age as a means to dampen sound, quoting Ethel Spencer, “When I think of the winters of my childhood, they have muffled sound and camphor smell that came with our velour curtains [14].”

By the early twentieth century the curtain had come under attack, mostly by the doyen of decorative arts Edith Wharton. In her manifesto written with Ogden Codman Jr., *The Decoration of Houses*, the chapter on windows banishes drapery from the well-bred house and promotes shutters as a compromise to filtering light, privacy and some temperature control [15]. Though by the mid 20<sup>th</sup> century, the development of the picture window caused curtaining to be utilized to correct (“right”) architecture. The large picture windows in the front façade of American suburban tract homes were situated for the sake of symmetry but generated interiors that were imbalanced and difficult to inhabit, wall-to-wall curtaining was utilized to correct these issues [16]. The advent of the modernist urban glass tower with floor to ceiling glazing further exacerbated this problem. The task of *The Performative Curtaining Project* addresses and rectifies such urban interior issues caused by large expanses of glass as well as obstructions caused by HVAC systems more typically found in pre-war apartment buildings.

Petra Blaisse, arguably influenced by Adolf Loos’ 1903 curtain-immersed bedroom for his wife Lina Loos and Lilly Reich and Ludwig Mies van der Rohe’s Velvet and Silk Café of 1927, has been a key figure in reinstituting curtaining into contemporary architecture and design. A territory she has critically explored in her essay *Curtain as Architecture*. This essay is pinnacle in the modernist understanding of curtains as performative constructs of the interior [17]. Blaisse’s method of description, a cataloguing of the functions that the curtain must perform, expands the definition of a curtain from a wealthy client’s indulgence to an equal partner in the function of an exemplary interior. This essay along with a series of functionalist descriptions from Victorian parlor drapery have been a critical guide in examining a new kinetic and participatory place for curtains in a contemporary interior. While Blaisse’s curtains address spatial articulation, *Performative Curtaining* prototypes investigate contextual issues specific to an interaction between the window with its surrounding interior condition and the user. Additionally, Blaisse designs to the site specific and the spectacle, however *Performative Curtaining* aims to address the everyday and function in a multitude of conditions.

### 2.2 The Curtain and Architecture

In addition to Blaisse’s curtain work within the interior environment, curtaining has also been embraced in the field of architecture with critical projects that shift the hierarchical

consideration of the curtain. Shigeru Ban's 1995 Curtain Wall House and Hertl Architekten's 2010 Aichinger House, both invert the physical location of the curtain from interior to exterior, while Kennedy and Violich Architecture's (KVA) 2008 and 2013 Soft House's increase the responsibility of the curtain, both interior and exterior. Each of the projects raises the accountability of curtaining and better substantiates the critical relationship between interior and exterior through the curtain device. Ban's Curtain Wall House establishes the curtain as the true exterior wall. While an inner confined interior is potentially fully separated from the elements by a thermal break glass wall, it is a literal curtain wall that forms the exterior façade. The malleability of the curtain causes a temporal separation between a confined interior to a far greater connection with the city [18]. The inhabitable expanse between the curtain and the glass thermal break is at once interior and exterior, part of the house and part of the city.

Hertl Architekten's Aichinger House also inverts the curtain from an interior to an exterior condition. The curtains, unlike Ban's, are set directly in front of the glass façade, without a habitable space between. They can be drawn and held open with a tieback, to allow light and view, much as they would on the interior. The designers, however, chose to further exploit textile for its thermal properties in addition to its light blocking capabilities. The large expanse of exterior curtaining not only provides privacy but also deflects sunlight and reduces solar gain [19]. Arguably, the full building curtaining functions as a substantive thermal barrier as there are no breaks from ground to roof for drafts to enter the interior environment.

Kennedy and Violich Architecture's (KVA) Soft Houses, locate curtains both within the interior and exterior, they additionally imbue the curtain with an entirely new responsibility. The initial proposal was for a residence within which soft structures replaced traditional built walls. The curtains integrated thin film photovoltaic to harvest solar energy and then distribute it to power the house. KVA has since built a series of four row houses in Hamburg, Germany that extend this initial research. The Hamburg townhouses employ the soft textile wall system with integrated LEDs. The power in this iteration is collected by a series of photovoltaic textile ribbons on the building's exterior that harvest the energy while also forming an exterior-interior condition [20].

### 3 METHOD: THE PERFORMATIVE CURTAINING PROJECT INTENTIONS

*The Performative Curtaining Project* curtain prototype investigations learn equally from the interior and architectural curtaining histories and case studies.



Fig. 1. The Performative Curtaining Project process studies.

*Performative Curtaining* research analyzes a taxonomy of window conditions, including double hung, picture window, industrial loft, glass tower window walls, sliding window, and casement window. The catalogue of architectural fix conditions includes window air conditioner, through the wall air conditioner, open window, baseboard heating, draft at window edges, asymmetrical picture window, draft at floor, and framing and controlling views. With *The Performative Curtaining Project*, we have initiated the design and fabrication of a series of conditions that address the pragmatics of drapery via analogue and digital methods. This praxis research is an extension of the theoretical inquiries found in the expanding body of knowledge for interior design. Through the manipulation of prototypes, we have begun to test pedestrian ideas of domesticity and to create new textile-based interiors. Fabrication methods encompass hand sewing, machine sewing, smocking, folding, pleating and embroidery. Materials comprise woven, knit, and felted textiles, as well as conductive thread, photovoltaics; and smart textile assemblies. Prototyped typologies to date include *Retractable Curtaining*, *View/Furniture Curtaining*, *Snap/Switch Curtaining*, *Illuminating Curtaining*, and *Thermal Curtaining*. The curtaining prototypes were fabricated and tested in New York City, though the typologies are appropriate to international urban conditions.

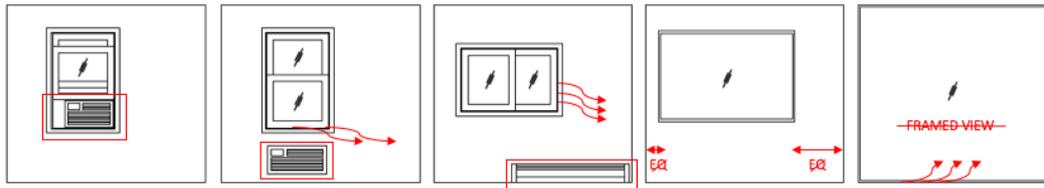


Fig. 2. Catalogue of architectural fix conditions.

### 3.1 Retractable Curtaining

*Retractable Curtaining* is intended to meet existing conditions; resolve issues caused by heating, ventilating, and cooling (HVAC) elements; respond to season and climate; frame views; and correct overexposure due to large glass expanses within the interior environment retractable adaptation.

The curtain, prototyped in 100% recycled PET felt, can be retracted both vertically and horizontally to accommodate varying structural and functional conditions. Unlike an off-the-shelf curtain that rarely has a precise fit to an existing interior condition, the base of the retractable curtain can be adjusted vertically to fit the given interior height. The curtain can be further retracted to retract above unit air conditioners, baseboard heating elements, and to allow airflow through an open double-hung window. Additionally, the curtains can be retracted internally to create view windows, adjusted to thicken around the window edges, and to puddle on the floor to minimize drafts. The curtains are also retractable from the top down, producing a clerestory window.

The operable openings in conjunction with the overall *Retractable Curtaining* capabilities empower the inhabitant of an urban interior to precisely frame view and control light. The modular versions can be expanded, reduced, or composed by combining multiple modules for urban interior conditions with large window expanses. Such accommodation is useful in urban glass towers where expanses of glass are not able to control view or light.

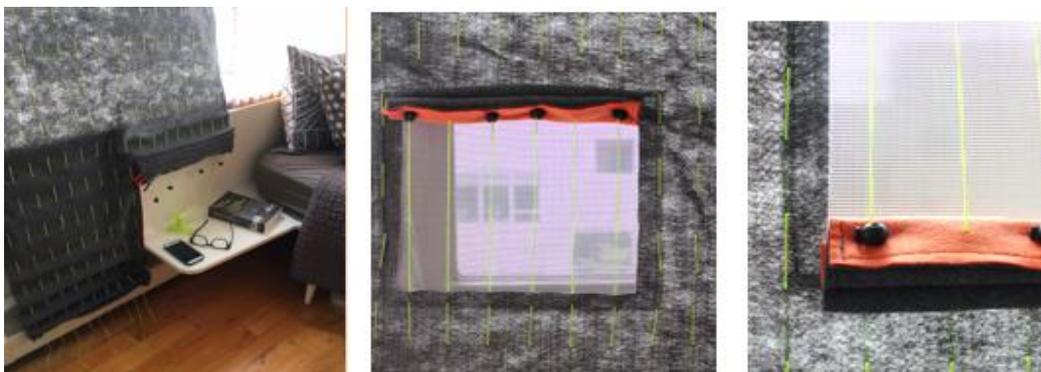


Fig. 3. Retractable Curtaining detail views.

### 3.2 View/Furniture Curtaining

*View/Furniture Curtaining* further expands curtaining's function to incorporate decor and furnishing. The canvas and felt prototype contain a series of openings that are reinforced with rigid felt surrounds and equipped with magnetic snaps for the attachment of functional inserts. This curtain continues the device of modularity as the inserts are systematized and interchangeable. The prototyped design contains multiples of one systematized insert that, through various folding operations, can perform three functions or be removed entirely. Firstly, as a shelf that recedes behind the curtain. The shelf can carry the weight of a framed photograph or object, hence integrating furnishing functionality. Secondly, simultaneously as a portal cover and functional pocket (capable of holding objects) on the front side of the curtain. Lastly, folded and secured above the portal, hence framing view. Such curtains reorganize the glass facade residential tower as a device for framing view, while simultaneously minimizing additional furnishing requirements, consequently reducing consumption. The curtain incorporates a modular retractable

extension piece and, like *Retractable Curtaining*, can be further customized as a larger modular expanse. As the interior is temporal, the addition of the retraction pieces allows this curtain to adapt to multiple locations, accommodate climatic changes, and adjust to meet obstructions.

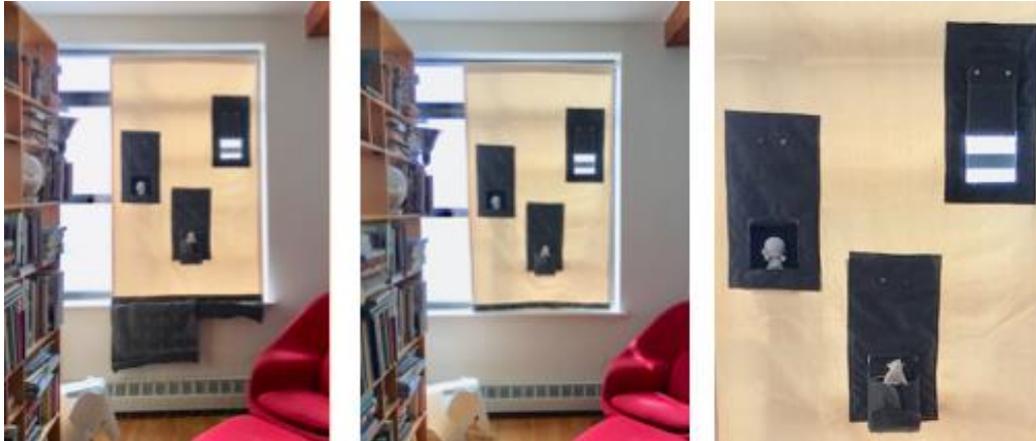


Fig. 4. View/Furniture Curtaining with retractable module, without retractable module, and inters detail.

### 3.2 Snap/Switch Curtaining

*Snap/Switch Curtaining* furthers the research from the previous two curtains. It not only incorporates furnishing, lighting, fenestration, but also is length adjustable. Inner portions of the panel can be folded open to allow view through the solar screen; the folding of the panel simultaneously forms a shelf and battery powered LED light fixture. The grid of snaps functions to support the folded shelves, to hang add on elements such as pockets, and to fold the curtain from the bottom or the side to create variations in height, width, and density. The panel is constructed from the same recycled PET felt as the previous curtains and can also be considered a module of a whole, readily expandable with the grid of snaps.



Fig. 5. Snap/Switch Curtaining open view and details.

### 3.4 Illuminated Curtaining

Derived from an experimental curtain designed by mid-century modernist lighting designer Richard Kelly, this is an attempt at giving a curtain a responsibility in addition to being a decorative object in an urban inhabitation. During the evening it provides a soft atmospheric illumination over a window opening and during the day it functions as a contemporary Roman shade. The combination of functions, light and shading is a necessary design tenant in a small urban habitat, reducing excessive consumption of consumer goods through multi-functionality.

The curtain is constructed from heavy weight canvas that is sufficiently stable as to maintain a planer effect when fully extended. This material is also substantial enough to support the organza lanterns that contain LED lighting embedded within the textile. The initial prototype has a series of chartreuse lanterns

but the colour will be variable in further iterations. The curtain will ultimately be constructed as a Roman shade where the lanterns will be integrated within the folds while drawn.



Fig. 6. Illuminating Curtaining in situ and lantern details.

### 3.5 Thermal Curtaining

Drawing on a number of historical precedents, the *Thermal Curtain* is an investigation into the performative nature of drapery “puddles”, the additional yardage that “puddles” at the floor in traditional curtain installations. The design of the Thermal Curtain mimics a lady’s wool coat with faux cuffs and bottom trim and pays homage to the probably deeply thermally sound Lina Loos bedroom. Normally thought of as a nod to extravagance, additional yardage of fabrics would equal additional cost for drapery. The traditional “puddle” actually can make a vast difference in combating drafts at the baseboard level. This curtain combats drafts in a blatant and intentionally obvious manner. It can be used at the base board level and the window sill level, also potentially as a portiere.

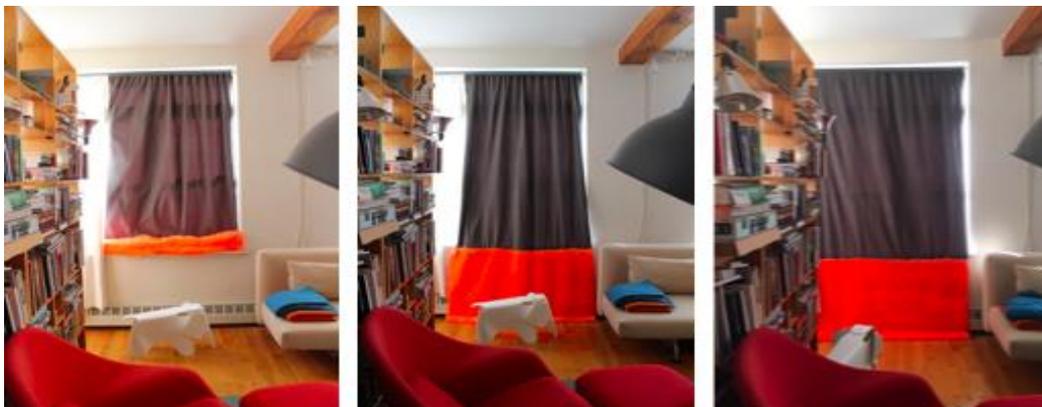


Fig. 6. *Thermal Curtaining* in situ.

## 4 OUTCOMES

### 4.1 Curtaining as a collaborator in reducing emissions

The idea of *Performative Curtaining* collaborating with the architectural envelope of the building is being developed through this praxis of curtaining prototypes in *The Performative Curtaining Project*. The interaction of the curtain panel to the building’s envelope is crucial to assessing draft transmission at the windows edge. The concept of “tight building envelope” is a major tenant of the Passive House movement and sustainable building criteria, this project would like to explore the potential of curtains engaging directly with the Passive House building assembly. New York City’s newly passed Climate Mobilization Act is poised to demand a 40% cut of all building’s emissions by 2030, the *Performative Curtains* can be a partner in reducing buildings’ emissions [21].

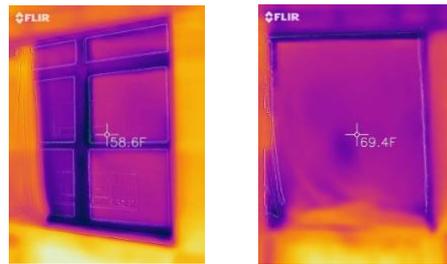


Fig. 7 Thermal imaging of bare window versus with Thermal curtain.

Our taxonomy of typical urban windows as well as a thorough understanding of drapery hanging mechanisms enables us to examine how a curtain can be used as a tool in creating a tight building envelope. Historically, in particular within Victorian households, elaborate valances could hide bulky drapery detail as well as create a seal at the top edge of the drapery to combat drafts from the upper window opening. Victorian drapery was notoriously excessive but the actual drapes in heavy velvet and wools allotted up two times the actual window width, which allowed the sides of openings to protect from drafts; the often derided drapery “puddle”, was not used to show off wealth by illustrating how much fabric one could afford, but was the first line of defense between a leaky baseboard and the interior realm.

The *Thermal Curtain* and the *Retractable Curtain* both have the potential to help the architectural building envelope create a more commodious climate. The *Thermal Curtain* is a play on the notorious drapery puddle and the Retractable curtain expands far past the window opening to cover potential drafts at the window’s edge. When monitored with a thermal imaging camera, both curtains, when deployed completely, heightened the temperature 10 degrees within the interior. The *Thermal Curtain* was greatly helped by the faux fur material that was employed to be a draft dampener at the bottom of the curtain. The *Retractable Curtain* also intended as a thermal combatant was able to add warmth by virtue of the double-sided felt falling past the side of the window up to 6 inches on either side and by the use of small discreet openings, made with solar mesh and detailed within the curtain with a 4-inch selvage around the textile portal.

#### 4.2 Drapery as a mediator of the ubiquitous window wall

Rem Koolhaas, in his chapter *Windows* in his book *Elements*, discusses the evolution of window glass from discreet puncture within a building envelope to endless transparency that envelopes the perimeter of a building. The Curtain has had much the same evolution, from minimal rectangular panel to Petra Blaisse’s epic spatial markers. We would like to propose Koolhaas’ technique of collapsing functions i.e. window as roof, window as wall, window as façade, window as ceiling as a comparable method of fabricating curtains. Collapsing of the curtain into the window condition is perhaps a remedy to the inhospitable curtain wall on the interior. In this project, the window has evolved into a façade and the curtain has assumed much of the responsibility at a domestic level as the portal window: filtering, light transmission, ventilation and framing. The Koolhaas diagram laments;

“Windows, the operable kind, offer not just a view of the outside world but the possibility of contact with it, passively in terms of feeling a breeze and listening to the noise of the outside world, and actively in terms of shouting or tossing something down to the street, or just sticking your head out and taking the air. Since the 20<sup>th</sup> century and the growing preference for enormity or panorama, more and more windows provide a view of the world, and not a physical connection to it [22].”

The 20<sup>th</sup> century all-glass wall has promoted a metaphorical expansiveness world view that has left behind a level of haptic intimacy, we can now employ our curtains as antidote. Physical engagement and manipulation are central to the concept of performative curtaining. *Retractable Curtaining*, *View/Furniture Curtaining* and *Snap/Switch Curtaining* all work in an effort to not only frame view. The three aforementioned curtains can be customized through multiple operable portals in order to respond to view, climate, solar intensity, and requirement for privacy.

### 4.3 Collapsing functions and critiquing domestic consumption

The contemporary window panel available at Ikea, Crate and Barrel, and West Elm has captured the urban dweller's pocketbook. In this praxis study of curtain typologies, the parameters of the off the shelf curtains, using the dimensions of 145 cm in width and 250 cm in length enables an assessment of the performative conditions of these dimensions. These dimensions are derived for the market as they are universal to a majority of urban dwellings. This dimension can be folded and packed to a manageable shipping size, approximately, 38 cm x 25 cm x 7 cm, and the size when unfolded can be manipulated by one person to hang. Using the measurements and attachment details of the average off-the-shelf panel has allowed us to challenge the given condition, by introducing a series of apertures in the curtain surface, adding materials and even lighting to the everyday curtain.

The discreet manipulation of the standard panel allows for curtaining that is more individual and interiorly functional. This collapsing of functions, that a curtain can become a party light, a curtain can be furniture, storage, or picture frame, puts forward the idea that these curtains could promote a consumption ideal of buying less since the product has two or more functions. No longer do you have to purchase a picture frame and a curtain panel, merely buy one and expand your interior sphere. By adding an additional function to each curtain, the disposability of cheap, off-the-shelf products might be avoided. These curtains are able to be in a variety of apartments and dwellings and can be reconfigured to adapt to new environments.

This curtain prototyping activity is addressing the everyday engagement of an urban inhabitant and the building envelope by making the curtains easily manipulable. The research examines domestic scale in the interior by interrogating the off-the-shelf dimensions. This ultimately creates a critique of the home store market place by collapsing small domestic functions into one marketable item.

## 5 FURTHER INVESTIGATIONS

Further prototyping of all *Performative Curtaining* typologies will consider intelligent and e-textiles. Research includes the implementation of fiber-based photovoltaics to capture energy and fabricate curtains with conductive threads to connect micro LEDs and batteries. Such abilities would enable us to integrate more sophisticated lighting, sound transmission (capable of creating and/or projecting sound), and elements for charging and powering mobile devices [23]. Additionally, further investigations will incorporate curtaining that spatially and materially facilitate the ready fabrication of habitable interior exteriors and exterior interiors.

## 6 CONCLUSION

The curtain, as evidenced, is well poised to bridge architecture and the interior spatially. Examining curtaining's historically performative role highlights issues of functionality and consumption. Prototyped and tested curtains provide context for window treatment beyond the decorative, adapting to frame views, and compressing and expanding to meet changing spatial and climatic conditions. In combining the tasks of decorative and functional objects (lights/curtains, frames/curtains, shelf/curtains), the *Performative Curtaining* prototypes implement an edited cohesive urban interior environment. These *Performative Curtaining* investigations are the beginning of a far more comprehensive body of research praxis.

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