Abstract - Polychrome, gilded, and embossed leather was considered an attractive covering for decorative furnishings and walls in American Gilded Age mansions. These specialty European leathers originally crafted in the 17th and 18th century were either repurposed in the 19th century for the American market or, new versions of them were crafted following evolving 19th century technologies. By the 21st century, with a decreased demand for these decorative leathers, the craft traditions had become a forgotten art. The 2003 decision to replace 1,400 square feet of polychromed embossed leather in a gilded age boardroom presented an opportunity to visit the atelier to discuss and document the decorative finishing process. This presentation shares through a photo essay how one workshop has revived this traditional craft for the 21st century marketplace. Decorated leathers are produced using a combination of traditional techniques and contemporary materials. The presentation will also address how these leathers were prepared and mounted for long-term preservation needs using current materials and methods.

Título - FUSIÓN DEL SIGLO XXI CON UNA EDAD DE ORO, LA SALA DE REUNIONES FORTUNE 500
Resumen – El cuero policromado, dorado y repujado era considerado como una cubierta atractiva para los muebles decorativos y las paredes de las mansiones en la Edad de Oro Americana. Esta especialidad en cuero europeo, originalmente manufacturado en los siglos XVII y XVIII, fue reutilizada en el siglo XIX para el mercado americano, o bien, se crearon nuevas versiones de dicha especialidad empleando tecnologías desarrolladas durante ese siglo. En el siglo XXI, con una disminución en la demanda de estos cueros decorativos, las tradiciones artesanales se han convertido en un arte olvidado. En el año 2003, la decisión de sustituir 1,400 pies cuadrados de cuero repujado y policromado al interior de una sala de reuniones de la Edad de Oro, presentó una oportunidad para visitar el taller con la finalidad de discutir y documentar el proceso de acabado decorativo. Esta presentación comparte a través de un ensayo fotográfico, cómo un taller ha revivido esta artesanía tradicional para el mercado del siglo XXI. Los cueros decorados se producen usando una combinación de técnicas tradicionales y materiales contemporáneos. La presentación también indicará cómo estos cueros fueron preparados y montados para las necesidades de preservación a largo plazo, utilizando materiales y métodos actuales.

Titre - INTÉGRER LE 21E SIÈCLE À UNE SALLE DE RENCONTRE DE LA PÉRIODE GILDED AGE
Résumé – Le cuir polychrome, doré et repoussé était considéré comme un produit de recouvrement attrayant pour les meubles décoratifs et les murs de somptueux manoirs américains de la période Gilded Age. Ces cuirs européens spécialisés, fabriqués au 17e et 18e siècle, ont été adaptés au 19e siècle pour le marché américain et de nouvelles versions ont été fabriquées en utilisant des technologies du 19e siècle. Au 21e siècle, la demande pour
1. INTRODUCTION

The American Gilded Age was an era of conspicuous spending that spanned from the 1870s until just before the First World War. Named the Gilded Age after the title of a contemporary novel co-authored by Mark Twain, great wealth was consolidated among a fortunate few industrialist families led by patriarchs who considered themselves “nature's noblemen”. The families built scores of princely country residences that would rival the palaces of Europe and be compared to Kublai Khan's Xanadu. One of the decorative elements employed to visibly reinforce the desired sense of power, wealth, and grandeur was gilded and embossed leather. It was used lavishly on the walls and furnishings of these impressive surroundings. Examples of America’s Gilded Age castles open to the public include the Breakers, the Elms, and Chateau-sur-Mer in Newport, Rhode Island, the Biltmore Estate in Asheville, North Carolina, and Hearst Castle in San Simeon, California.

1.2. HISTORICAL BACKGROUND

A similar level of grandeur that served as a hallmark of prestige and purpose was found in the executive boardrooms of the industrialist corporations of the period. These rooms, as exemplified by the MetLife boardroom, were crafted with multi-toned, coffered gold ceilings and included walls of hand-tooled leather, parquet floors, and intricately carved mahogany wainscoting and fireplace surrounds (fig. 1). They typify the elegance of design and superb craftsmanship of the era and illustrate the wealth and enduring stability of the company. The desire to preserve the architectural aesthetic of the boardroom led to preservation efforts throughout the history of this Fortune 500 company.

In 1928, the original 1894 leather wall coverings were replaced due to advanced deterioration caused by red rot. In 1958, the boardroom was dismantled and its effects stored until it could be recreated in a new location in 1960. Another set of leather wall coverings was crafted at this time. In 2004, the company once again dismantled the boardroom in preparation for its second intact relocation to a new building. Contractors were engaged to remove the gilded coffered ceiling and hand-carved mahogany wainscoting and tile fireplaces. Sources were identified to reproduce yet another set of wall leathers.

The acknowledgement that the traditional hand-crafted process for making gilded leather was a forgotten art guided reproduction decisions. The primary concern of the client was to respect the historical integrity of the boardroom.
Design specifications for the reproduction leather wall coverings were developed through archive research, field documentation, and materials testing. Archive research found limited documentation on the history of the boardroom. An article with a black and white photograph in the popular press celebrated the completion of the boardroom in 1894 as “probably the grandest of its kind in the United States,” a place which would “invite calm deliberation on the part of its occupants” (Phillips 1894). Company archives included a second undated black and white image and a late 20th century, colored image of one end of the room. Board minutes in the late 1920s recorded a dollar amount ($5,750.00) and an authorization “to reline and apply new hand tooled leather” (MIC 1928).

The recognition of the boardroom as an emblem of the company’s historical continuity prompted the publication of a pamphlet in 2000 to chronicle the 1960s relocation project. The pamphlet highlighted the detailed workmanship and modifications to architectural space that preserved the boardroom’s integrity yet provided for modern comfort and convenience with state of the art lighting and sound system fixtures. A timeline of major events follows:
1894: Installation of leather in original boardroom.
1928: Installation of new leather in original boardroom.
1961: Re-installation of woodwork and installation of new leather panels in new location.
2004: Removal of woodwork
2005: Re-installation of woodwork and installation of new lining and new leather in new location.

Fig. 2: The boardroom during disassembly. The 1960s-era leather was installed on apparently unprimed plywood. Courtesy of ArtCare Resources.

1.4. FIELD DOCUMENTATION

Site examinations by ArtCare Resources assessed the condition and installation process of the existing 1960s leather wall coverings. Assessments indicated that unlike the handcrafted 19th century processes, this rendition was consistent with 1960s printing methods and employed a cellulose nitrate lacquer for a protective coating. The overall design suggests an amorphous paisley motif that is mirrored in opposition within four quadrants of a large rectangle and edged at the top and bottom of the walls with narrower border panels of a modified design. The panels were abutted edge to edge and directly adhered to an unprimed plywood substrate with a starch-based adhesive. This mounting medium was suggestive of a “steam adhesive”, a concentrated wheat starch developed in the 1950s and 60s to install the solid vinyl wallcoverings then replacing oilcloth in the commercial market.
Measured drawings of the 1960s-era boardroom were taken by many trades in order to re-install existing woodwork, decorative architectural features, and the wall covering with precision. Close coordination was necessary because the dimensions of the new tooled leather and the new wall surface had to match within tight tolerances.

Lack of clear documentation of the 1890s and 1920s patterns, poor aging characteristics of the 1960s leather exacerbated by the use of alkaline cleaning products, and the inherent fire hazard of the cellulose nitrate varnish influenced the decision to reproduce a new set of leather wall coverings. The goals were: (1) to reproduce the gilded embossed leather from a 1960s sample, (2) to minimize long term preservation risks from manufacturing processes, the boardroom environment and maintenance routines, and (3) to develop mounting methods that would allow the potential removal of the leather.

1.5. REPRODUCTION PREPARATION

After a dry mechanical removal of the 1960s leather from the walls, two representative panels were sent to the Lutson Goudleder atelier for sample preparation.

Fig. 3: Close-up photo of boardroom leather, 2004. The best specimens of the large panels and border panels were labeled, stripped from the walls, and sent to the atelier to be used as models. Courtesy of ArtCare Resources.
2. MATERIALS ANALYSIS: COATING

Current technologies and the adoption of international standards for tanning have standardized how embossed and gilded leather is produced in Europe for 21st century markets. The Lutson Goudleder process to emboss, gild, and hand-color the vegetable tanned full grain calf, interprets 17th century methods from Ghent, Belgium, using proprietary combinations of artist’s materials and commercially available products. Visual inspection of the Lutson samples and a prepared cross-section of the reproduction leathers were taken to identify craft procedures and material variables, and to assess forward-looking preservation concerns (fig. 4).

Specimens of each coating layer (2, 4, and 5) and a light scraping of the surface coating (6) were analyzed for chemical composition using infrared microspectroscopy. According to a report prepared by the materials analysis firm, infrared spectra showed features consistent with the following materials: (2): adhesive coating = acrylic resin; (4): yellow coating = shellac; (5): clear coating = alkyd resin; and (6): surface film = wax or waxy coating (Martin 2004).

The use of synthetic resins introduced non-traditional components and provided evidence of an evolving process. Analysis also indicated that the acrylic resin layer (2) is bulked with silicate materials, a new component possibly to aid in leveling depressions in the leather surface. Consistent with traditional techniques, the shellac layer (4) imparts a gold color to the aluminum foil layer. Another introduced material is the use of an alkyd resin (5) as a protective coating. Alkyd resin coatings are clear, tough, and flexible, and protect the shellac layer from abrasion. The coating is particularly helpful as these leathers in different designs are also marketed for table-top coverings and wearable art which need to be resistant to the risks from frequent use and cleaning requirements.

A specimen of the metallic layer was analyzed for elemental composition using elemental microanalysis. The resulting x-ray spectrum showed features consistent with chlorine and lesser amounts of aluminum and silicon suggesting the presence of an aluminum-coated, polyvinyl chloride or another chlorinated polymer film. A continuous polymer carrier film was not evident in the cross-section, but an on-site visit confirmed the use of a foil attached to a polymer carrier film.
Fig 4: The cross-section examined under ultra violet light illustrated six layers: (1) leather, (2) adhesive coating, (3) metallic layer, (4) cracked yellow coating, (5) clear coating, and (6) thin film. Courtesy of Orion Analytical LLC.

2.2. PROCESS DOCUMENTATION

The analytical results were supported by an on-site consultation to photo-document the embossing and decorative procedures and materials. The process starts with the craftsman coating the original leather sample with Vaseline petroleum jelly and taking a polyurethane casting of the textured design. When the urethane mold is released from the leather, the mold is dusted with red powder and set aside while a hard casting wax is warmed, poured and leveled in a frame support.
The urethane negative cast is pressed into the wax and removed, leaving some red pigment to identify where impressions in the wax cast need additional detailing with hand-tooled copper dies. Once corrections are made, a second polyurethane mold is made from the hand-finished wax casting. This urethane casting is used to emboss new leather panels. In preparation for insertion into a hydraulic press, the reverse of the urethane casting is reinforced with fiberglass cloth and epoxy resin, and a rigid casting plate. As a unit, this is hinged to a flat metal underplate, forming a sandwich-like folder that aligns the leather when inserted into the press. With over 400 leather sections to be embossed, multiple castings were necessary due to wear and tear.

In preparation for embossing, a natural tan, full-grain, calf skin is tinted with a brush application of a brown/black polyurethane and latex glaze. The coating modifies the color of the leather and serves to adhere the gold foil to the leather during the embossing process. The tinted leather is inserted into the folder with the grain side facing the mold. A gold foil laminate is placed foil side against the grain layer and the folder is closed, sandwiching the mold against the foil and the leather.

To create the pattern, the unit is drawn into a hydraulic press pre-heated to approximately 90 degrees centigrade and kept under pressure for approximately two minutes. Variations in pressure, temperature, time, and leather density produce slight differences in the depth of the
relief on each section. The holder is then removed from the press and allowed to cool. As the glaze/adhesive cools it contracts, creating a fine spiderweb pattern of visual imperfections as the foil tears and folds around the contracting resin. These intentional blemishes expose the underlying tinted coating and contribute to the aged appearance.

Once cooled, the artisan peels away the carrier film from the foil, and the foiled leather is ready for a brush coating with tinted shellac. The shellac layer, once dried, is coated with the polyurethane/latex glaze to further antique the overall appearance and to provide a tooth for the selective decorative hand finishing with oil glazes (fig. 6).

Glazes are prepared using commercially available artist’s oil paints and extenders. The artisan, guided by a template, hand-stipples the amber and green colors allowing the gold foil to shimmer through the glazes. Slight variations in the hand-stippling, edge feathering, and the production of individual batches of glaze produce a unified but lightly mottled hand-crafted appearance. Glazes are allowed to dry for several days before a final protective tinted alkyd coat coating is brush applied. A final coat of a natural hard wax is the last application. Once the wax layer is dry and buffed, the panels are ready to be shipped for the installation process.
3. LEATHER PREPARATION AND BACKING

Prospective mounting of the leather panels raised concerns about the risk of dimensional changes and loss of relief due to contraction or expansion of the leather from the water based adhesives and primers. These issues were considered by noting traditional methods of working with embossed wallcoverings. In the late 19th century, highly decorated embossed papers of Japanese origin, called “leather papers”, were backed with cotton scrim to stabilize the material during hanging. Similarly, early versions of Lincrusta, a deeply embossed and durable wallcovering, also used scrim in the late 1870s.

Following these protocols, installation trials tested the benefit of applying a backing to the leather to stabilize the size and shape during installation. The application of a backing also provided a physical means to remove the leather from the walls intact. Medium-weight cotton muslin, polyester heat set fabric, and a polyester, plain weave fabric were tested. The medium-weight plain weave, known as poly muslin in the trade, was chosen due to its dimensional stability in contact with moisture from the adhesives and its ability to release from the wall and the leather without damaging the leather.

To prepare the individual panels for mounting on the wall, the flesh side of each leather panel was rolled with an undiluted, clay-based, strippable adhesive. A sheet of polyester fabric was hand pressed onto the reverse of the leather panels. Panels were weighted between blotters to accelerate drying. Multiple exchanges of dry blotters wicked moisture away from the leather, sped the drying process and maximized control over subsequent dimensional changes to the leather. Even with these controls, contraction was as great as a quarter-inch in each dimension over a two-week drying span. Moreover, it was observed that the leather panels continued to contract and expand in reaction to changing humidity levels in storage and workshop areas.

The leather panels emerged from the backing processes with a ragged fabric outer edge, not unlike a “deckle edge” from handmade paper production. This selvedge protected the panel during transport and was trimmed just before installation on site.

4. WALL PREPARATION

The testing extended to materials used for preparing the wall surface. The unusual amounts of leather (257 regular panels and 150 border panels) placed health and safety parameters on the installation process. The following were tested as sealants for the birch laminate: Fabulon Crystal, Sancure 878, and MicroChamber, a carbon-based paint. The water based Fabulon product was the preferred choice due to sealing, sanding and application qualities.
Fig. 7: The robust concrete/plywood substrate was specified to forestall wall shifting which had compromised the previous installation. Courtesy of WallpaperScholar.Com.

5. MOUNTING ADHESIVES

Beva 371, Beva D-8, methyl cellulose, zin shofu cooked wheat starch, and strippable and non-strippable clay-based commercial grade adhesive were tested. The criteria for evaluating the adhesives were: compatibility with the leather and birch substrate, adhesion, reversibility, toxicity, handling, ease of use, and prospects for long-term stability. Attention was also paid to release qualities in the event of a facility water incident. Testing involved mock-ups using all test materials on wallboard and 4' by 4' sections of birch marine plywood.

A clay-based strippable adhesive was chosen for the installation process based on field performance reviews of commercial clay adhesives over a 30-year span, conversations with company chemists, and testing results for ease of strippability. Unlike the non-strippable clay-based adhesive that ruptured the wallboard top films and flesh side of the leather upon removal, the strippable formulation crystallized after curing causing the film to shatter, allowing a clean release at the wall/polyester fabric interface. Conversations with company chemists confirmed that the clay-based adhesives consist of corn starches, kaolin clays, sodium nitrates, fungicides and bactericides. The clay is inert, but provides non-compressible solids and bulk which help to
anchor materials to the wall.

6. INSTALLATION

Carpenters mounted marine-grade, birch veneer plywood sheets to a concrete block wall; metal fasteners were countersunk around the perimeter of each panel at eight inch intervals. Splines and fastener holes were filled and made smooth. The veneer surface was sealed with two barrier coats of an acrylic urethane coating. Once dried, it was coarsely sanded, vacuumed, and hand wiped. An application of an acrylic wallcovering primer (Prep-Coat) followed. The primed surface was rolled with a foundation coat of a clay-based strippable paste. Once dry, a second layer of clay-based strippable paste was rolled on the wall and a medium-weight polyester fabric adhered to the wall. After the fabric was dry, a thinned sizing of strippable clay was applied over the fabric to prepare a good foundation. This was allowed to dry overnight.

Installers utilized a laser-projected grid system based on the wall height of 180 3/8” to insure an exact fit of the leather panels. The full wall consisted of three courses of large panels and two courses of border panels. The design was centered on major wall spaces and engineered to be brought together over doors by double-cuts and in corners by kill points. Just before receiving the leather panels, wall mounted sections of dry fabric were again sized with a coat of strippable clay adhesive. While the wall adhesive was setting to the correct tack, an application of strippable clay-based adhesive was rolled onto the backing of the leather panels. Individually lined panels were then pressed into the paste, marrying the adhesive layers, using the grid system for guidance. The panels were smoothed with felt rollers and the edges rolled with wooden seam rollers to achieve proper contact. Edge losses were compensated with acrylic emulsion fluid paints (Golden). Where necessary, gaps along moldings were caulked with a small bead of tinted caulk (Phenoseal).

7. MAINTENANCE CONSIDERATIONS

The long term preservation of leather is influenced by its environment, exposure to light, and acidic and alkaline maintenance protocols. The mounting materials described here were chosen to promote the long-term preservation of the leather by minimizing volatile organic compounds and the direct contact of potentially hazardous materials. While unknown variables in the tanning process and application of commercially prepared coatings may influence the chemical and physical aging factors of the leather, a stable environment, air filtration, neutral cleaning agents that leave no residues, and use of wall materials with minimal off-gassing properties upon aging are anticipated to minimize the risks.
Fig. 8: The finished size of the constituent panels was reminiscent of the 19th century installation, which featured panels roughly 18” by 18”. Eight wall panels and eight border panels are shown here. Courtesy of ArtCare Resources.

8. CONCLUSIONS

This project has raised an awareness of the 21st century developments in the handcrafted traditions for gilded leathers. Through analysis and on-site observation, the authors have documented the introduction of synthetic materials and given thought to the installation risk parameters to better promote the long-term preservation of contemporary hand tooled gilded
leathers. An advantage of the contemporary processes is the extended life expectancy of the leathers due to the ability to control environmental conditions and airborne pollutants. Another advantage is that international standards for leather tanning reduce the risks of the chemical deterioration that has plagued 19th century and earlier gilded leathers. However, contemporary methods of production impose a set of unexplored aging parameters with the introduction of a variety of synthetic polymers. A documented approach and a thoughtful embrace of modernity can improve dialog among those entrusted with conserving tradition.

ACKNOWLEDGEMENTS

The authors wish to thank Frederick Poppe, Principal of Lutson Goudleder, Prec d'Adour, France, for graciously permitting access to his workshop; Building Conservation Associates, New York, for their help with field documentation and archival research; and James Martin of Orion Analytical, LLC for permission to quote from his report.

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MIC. 1928. Real Estate Committee Minutes, September 6, 1928. Metropolitan Insurance Company Archives.


SOURCE OF MATERIALS

Fabulon Products
101 Prospect Ave. N. W.
Cleveland, OH, 44115
Fabulon Crystal acrylic urethane coating

Gardner-Gibson, Inc.
P. O. Box 5449
Tampa, FL, 33675
433 Strippable Heavy Duty Clay Adhesive

Golden Artist Colors, Inc.
188 Bell Road
New Berlin, NY 13411
Golden Fluid Acrylics

North American Plywood Corporation
12343 Hawkins St.
Santa Fe Springs, CA 90670
Euro-birch marine plywood

Phenomenal Brands
2400 Boston Street, Suite 200
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