
CLAD
REX
We Start With Your Finish

OVERVIEW

Clad-Rex, Inc. is North America's most innovative producer of decorative and functional metal finishes, featuring vinyl-coated (clad and laminated are synonymous) and prepainted. We have almost 50 years' expertise in dependably supplying highly attractive, durable, and cost-effective finishes in steel and aluminum. Our distinctive surfaces enhance the appearance, functionality, marketability and value of our customers' products.

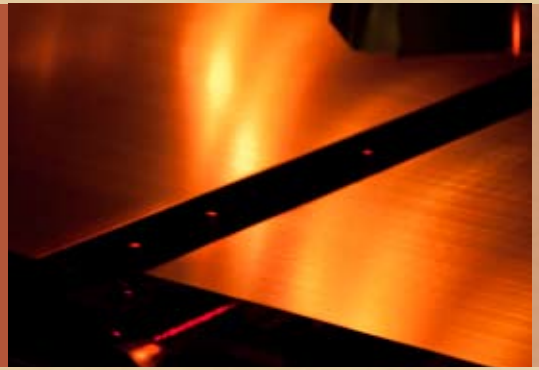
The premier producer of vinyl-laminated metals in particular, Clad-Rex offers an enormous, exciting, and ever-expanding palette of beautiful colors, patterns and textures. We can impart the look and feel of vibrant and subtle colors, exotic woods, rich leathers, handsome marbles and other dramatic stones, warm fabrics and cool metallics. Our coatings are highly durable and permanently bonded to the metal substrates; they're optimal for both indoor and outdoor usages.

While our products are top-of-the-line, they're surprisingly cost-effective and will likely reduce your total raw material expenses.

Clad-Rex offers resquared blanks, full-size sheets, slit coils and master coils produced to customers' exact sizes and quantities. We excel at small-volume and rush orders — with terrific economy. Materials are securely packaged and delivered to your plant, ready for fabrication or assembly. Our stocking programs are dependable, and Just-In-Time (JIT) deliveries run like clockwork.

Our technical expertise can be of vital help to your product design/development, marketing, and manufacturing staffs. We welcome the opportunity to discuss ways Clad-Rex can enhance your company's products — and success.

ABOUT US



steel sheets travel thru laminating oven

applying vinyl film upon steel

metal shearing – center bay

For almost 50 years, Clad-Rex has been pioneering and leading the metal coatings industry in variety, quality, reliability and value. Our three senior managers bring to bear over 100 years of combined knowledge and experience in this field. Clad-Rex is perfectly positioned to serve as your primary or single source for vinyl-clad, prepainted, powder and other coatings, especially given our …

- vast technical, application, and operational expertise
- supply program know-how
- trusted, reliable relationships with metals and coatings suppliers
- financial/capital abilities to fully maintain customers' large and rapidly-changing inventory needs

Headquartered in Chicago, Clad-Rex's central plant location offers quick, convenient logistics for customers throughout the U.S., Canada, and Mexico. We can also ship to Central and South America, Europe and Asia.

We carry substantial steel and aluminum inventories, with "Class 1" quality. Our cost-effectiveness and supply stability are reinforced through decades-long relationships with qualified steel, aluminum, vinyl, paint, and other suppliers.

A battery of metal shears supplements our coating capacities. We're masters in producing resquared sheets and blanks, including small sizes and stringent dimensional tolerances.

Clad-Rex is quality-obsessive. It's the focus of every department, employee and process. We're especially dedicated, since our performance is reflected – literally – in our customers' products. Our packaging quality is of the highest standards – goods arrive in pristine condition at customers' plants. Our production employees are true craftsmen, taking genuine pride in their work. Customer orientation, coupled with expert, courteous support, extend throughout our ranks.

Just-In-Time (JIT) stocking programs enable us to fully synchronize shipments with customers' production timetables, assuring uninterrupted supplies while minimizing their costs-of-possession.

Clad-Rex is honored to be consistently awarded "top supplier" rankings from a number of our most quality-intensive customers, including appliance, store fixtures, automotive, and building products manufacturers and fabricators.

We have an ongoing commitment to product research and development, technological innovation, and process control improvement. This devotion furthers our range of products, services and quality.

Our finishes are user-friendly and ecology-clean. Clad-Rex is committed to environmental safety. To that end, our equipment, materials and operations are in full compliance with all EPA guidelines. Moreover, our metals and laminates are highly recycled and/or recyclable.

Wondering about our company name? "Rex" is the Latin word for "king" … and we treat our customers like royalty.

PRODUCT FEATURES & BENEFITS

black textured vinyl roll

wood grain vinyl film

Precoated metals (the two principal forms are vinyl-clad and prepainted) eliminate the need for customers' in-plant liquid or powder painting. By purchasing Precoated, customers usually realize significant improvements in quality, cost savings, and production efficiencies. If you're currently painting in-house, or considering doing so, we'd be pleased to advise on your company's cost/value analysis.

Of the Precoated forms, vinyl laminates are "best in class." They provide superior aesthetics, durability and overall performance. While Clad-Rex is highly experienced in Prepainted metals, Vinyl-Clad is our strong suit.

VINYL-COATED FINISHES

We offer dazzling colors, pattern and textured finishes in various categories:

- Wood Grain
- Leather/Naugahyde grain
- Fabric & Carpet
- Embossed; stucco, pebble grain
- Metallic-Effects: steel, stainless steel, copper, brass, bronze, platinum, gold, silver, pewter. (All are available in standard or brushed effect.)
- Name/Logo imprinting

APPLICATION ADVANTAGES OF VINYL-COATED METALS

- Attractive
- Optimal coating quality and consistency
- Customizable design
- Enable product innovation and differentiation
- Durable – highly resistant to abrasion, peeling, tearing, texture loss, fading, stains, corrosion, chemicals, weather, moisture, household substances
- Flexible
- Temperature (hot or cold) insulation
- Sound-dampening
- Flame-retardant
- Non-toxic
- Electromagnetic and radio frequency resistance
- Fire resistance (self extinguishing)
- Fingerprint resistance
- Maintenance-free and easy to clean
- Environmental: vinyl contains post-consumer recycled content; recyclable and/or biodegradable after use

gray smooth vinyl roll

red leather-grain vinyl

coffee-colored smooth vinyl roll

white vinyl clad sheets awaiting shearing

Clad-Rex “Core Clad”

ECONOMIC BENEFITS OF VINYL-COATED METALS

- Eliminates your in-plant painting
- Increases productivity
- Reduces costs including labor, capital equipment, energy, materials, maintenance, environmental compliance, safety, insurance
- Conserves/frees-up plant space
- More economical in smaller quantities compared to Prepainted
- Normally faster production turnaround compared to Prepainted

METAL SUBSTRATE COMPATIBILITIES

Our products can be effectively and permanently applied to metal substrates including Cold Rolled, Galvanized, Galvalume, Aluminized, Electrogalvanized, Stainless, and Aluminum.

FABRICATION CAPABILITIES

Clad-Rex finishes are engineered for effective formability and are normally well-adapted to:

Pressbraking, Rollforming, Stamping, Perforating, Shearing, Piercing, Die-cutting, Crimping, Laser Cutting, Drilling, Punching, Beading, Folding, Drawing, Lockforming, Adhesive Bonding, Fastening, Wing Bending.

SPECIAL PRODUCTS

“Core-Clad”

Description: Two sheets of metal (steel and/or aluminum) bonded with a polyethylene foam core. Core thickness: 1/32" to 1/2".

Main Benefits & Features: color variety, corrosion protection of vinyl coating, lighter weight than solid metal with equal stiffness; insulation qualities; sound absorption (inside and outside)

Major Applications: food service appliances, walk-in coolers, HVAC equipment, evaporator and motor housing panels.

“Sea-Clad”

Description: Vinyl coated steel and/or aluminum sheets for marine (ships, gambling boats, oil platforms) joiner panels, walls and ceilings, with matching battens

Main Benefits & Features: flame retardant; nontoxic; available in all vinyl colors including white, black, beige, grey, woodgrains.

Our products are approved/certified by the US Coast Guard (USCG), American Bureau of Shipping (ABS), International Maritime Organization (IMO), and the Safety of Life at Sea (SOLAS) Convention.

VINYL-CLADDING MANUFACTURING PROCESS

cleaning line overview

sheets enter cleaning line

Vinyl coated metal is a value-added product in which vinyl film is adhesive-bonded to the surface of a metal sheet (usually Cold Rolled, Galvanized or Aluminum).

Here's the "abridged version" of Clad-Rex's manufacturing process …

STEP 1. CLEANING

Steel or aluminum sheets per customer specifications (thickness, grade, physical/chemical properties, etc.) are cleaned, brushed and dried to prepare their surfaces for coating in the following manner …

- *Stage 1* - Rinsed with hot water to remove surface impurities, dirt and oil
- *Stage 2* - Brushed to prepare sheet surfaces for cleaning
- *Stage 3* - Cleaned in a heated alkaline solution
- *Stage 4* - Rinsed twice using hot water
- *Stage 5* - Pretreated to improve adhesion
- *Stage 6* - Dried in-line
- *Stage 7* - Sheets are stacked on skids, then transferred to the laminating line

STEP 2. LAMINATING

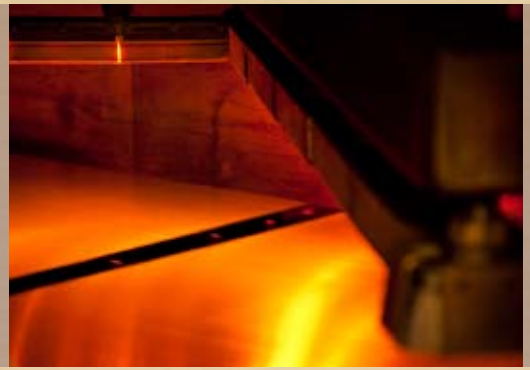
The "prepped" sheets then undergo the following process …

- *Stage 1* - Fed onto the entry conveyor of the laminating line
- *Stage 2* - Enter a coating room where the appropriate adhesive is applied to the sheet
- *Stage 3* -Travel through a 100-foot long oven section to properly cure the adhesive for lamination
- *Stage 4* - Exit the oven and immediately enter a set of laminating rolls where the specified film and metal substrate are laminated together
- *Stage 5* - The vinyl is trimmed to the sheets' edges (sides and ends)

heat unit below cleaning line

sheets exit cleaning line

sheets enter laminating oven



sheets travel thru laminating oven

vinyl film unrolling just before lamination

STEP 3. BACKSIDE PAINTING

When orders specify paint on the backsides (for improved corrosion resistance), the sheets are carefully turned over so that the original (bare) bottom sides are now facing up. The sheets then travel through a coating head which applies paint to the back (non-vinyl) sides of the sheets, and then pass down a conveyor for drying. The vinyl-clad sides are carefully protected to guard against any paint spillover.

STEP 4. VINYL ADHESION QUALITY TESTING

The first and last sheets of every order are tested for vinyl adhesion. Depending upon order size, coating type, further QC protocols and other factors, more samples may be taken. They are tested and evaluated for adhesion, color and grain retention according to Vinyl Laminators Institute guidelines (CS-245-62).

STEP 5. SHEARING/BLANKING

The vinyl-clad sheets are moved to our shearing department. They are cut to exact customer sizes and specifications, including width, length, and diagonal tolerances. During this process, the sheets and blanks are continually monitored for proper surface quality, flatness and dimension.

STEP 6. PACKAGING

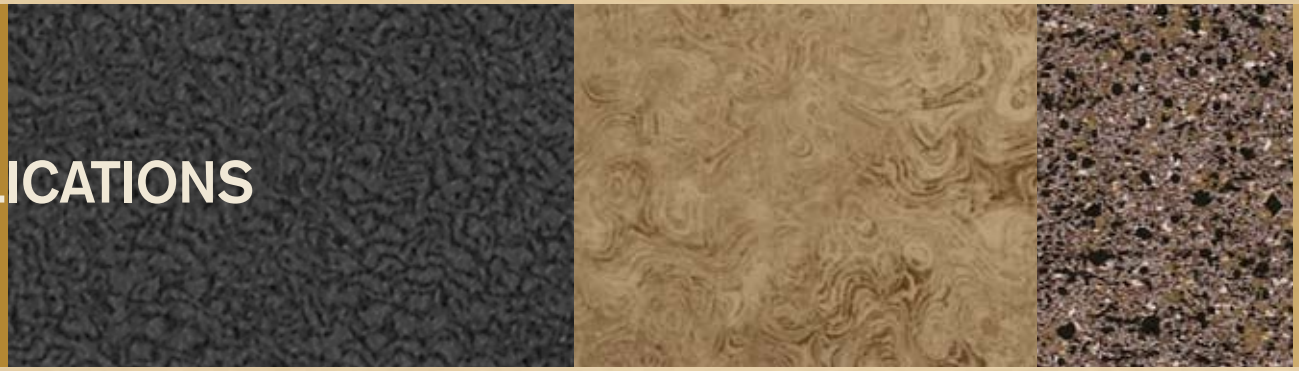
Material is evenly and tightly stacked, fully wrapped in strong waterproof packaging paper, and tightly banded to custom-fit wooden skids. Bar coded shipping tags are attached, clearly showing customer name, PO number, part name/number, finish type/color, thickness, size, quantity, weight, etc.

STEP 7. SHIPPING

The finished material is carefully transferred to our shipping bays, ready for prompt shipment or customer pickup.

vinyl film and metal sheet are laminated

MAJOR APPLICATIONS



Below is a list of the more common usages for vinyl-clad. Clad-Rex is pleased to assist with your prospective applications.

Building Products: single-ply roof trim/flashings, drip edge, gravel stop, interior walls & ceilings, interior doors, clean room panels

HVAC: air-conditioners, heaters, furnaces and components

Transportation: RV interior panels, fire & emergency trucks, truck trailers, ATVs, dashboard/instrument panels

Food Service & Commercial Fixtures: water and wine coolers, walk-in coolers, refrigerators/freezers, microwave ovens, drink dispensers, food & beverage carts, food & salad bars, warming/cooling units, vending machines, restaurant bars, dishwashers, trash compactors, mini-bars, storage enclosures

Marine & Oil Platforms: joiner panels, interior walls and ceilings, bridges, service spaces, pilot houses, living quarters, dining areas, offices, corridors

Furniture/Furnishings: partitions, racks, cabinets, picture frames, seating

Store Fixtures: merchandise displays, Point-of-Purchase fixtures, shelving, display tables, checkout counters

Computers & Accessories: CPU enclosures, server racks, monitor stands/trim, printer/scanner stands, power backup, surge suppressors, modems

Electronics/Audio & Video: speaker enclosures, video and speaker stands

Military: barracks, munitions and other supply containers

Miscellaneous: hunting blinds, gun cases, safes, signage

CLAD-REX PRODUCTION CAPABILITIES

white vinyl-clad sheets at shear

Below are our current, normal production parameters. We may be able to accommodate needs beyond these ranges. Please contact us with your particular specifications to assess feasibility.

BLANKS & STRIPS				
Substrate	***Thickness"***	***Width"***	***Length"***	***Tolerances"***
Steel	.018 - .080	1.00 - 50.00	144 max.	Wid. & Len. ± .015
Aluminum	.020 - .190	1.00 - 50.00	144 max.	Wid. & Len. ± .015

SHEETS				
Substrate	***Thickness"***	***Width"***	***Length"***	***Tolerances***
Steel	.018 - .080	24.00 - 50.00	60.00 - 240.00	per spec
Aluminum	.020 - .190	24.00 - 50.00	60.00 - 240.00	per spec

COILS				
Substrate	***Thickness"***	***Width"***	***Finishes***	***Processing***
Steel	.008 - .125	0.75 - 72.00	Prepaint, Vinyl	Slit, Emboss, Cut-to-Length, Strippable Protective Film
Aluminum	.008 - .125	0.75 - 72.00	Prepaint, Vinyl	Slit, Emboss, Cut-to-Length, Strippable Protective Film

micrometer measuring blank thickness

vinyl-clad blanks packaged for shipment

VINYL-CLAD TECHNICAL DATA

Note: Except where indicated otherwise, the following tests were conducted and their results based upon 8-mil vinyl film.

TABLE 1. TYPICAL PROPERTIES Film Thickness 8-10 mil (0.008" – 0.010", +/- 5%)		
Test (Method)	***Laminate Construction***	
	Single Ply	***Double Ply***
Abrasion Resistance (ASTM D1044)		
CS 17 1000g / 1000 cycles	8.3 mg	1.3 mg
CS 10 250g / 100 cycles	No weight loss	No weight loss
Gloss Retention (LAB 059) - 8 mins. @ 163° C.	Minimal gloss change	Minimal gloss change
Embossing Retention (LAB 059) - 8 mins. @ 163° C.	Minimal embossing change	Minimal embossing change
Stress Whitening (LAB 057) - 50% elongation	Minimal change	Minimal change
Blocking (LAB 060)	No effect	No effect
Crocking (LAB 058 / AATCC Method 8)	None	None
Light Stability	Minimal color change	Minimal color change

TABLE 2. STAIN RESISTANCE | CLEANING (NEMA LD 3.4 2000)

	Single Ply Laminate		Double Ply Laminate	
Staining Agent	**Stain Resistance**	**Cleaning Steps**	**Stain Resistance**	**Cleaning Steps**
Distilled Water	N	0	N	0
Ethyl Alcohol / Water (50-50)	N	0	N	0
Acetone	S	5	S	5
Household Ammonia	N	0	N	0
Citric Acid 10%	N	0	N	0
Vegetable Oil	N	0	N	0
Coffee	N	0	N	0
Tea	N	0	N	0
Tomato Ketchup	N	0	N	0
Mustard	M	5	M	5
Iodine 10%	N	4	N	1
Supermarket Stamp Ink	N	0	N	3
Pencil #2	N	2	N	2
Wax Crayon	N	2	N	2
Shoe Polish	S	5	S	5
Total Cleaning Score*		23		23

Stain Resistance

*see NEMA LD3 2000 for full description

N = No Effect
M = Moderate Effect. Difficult to perceive stain.
S = Severe Effect. Easily perceive stain or damage to surface.

Cleaning Steps

*see NEMA LD3 2000 for full description

0 = Removed with water
1 = 25 cycles spray cleaner or sponge
2 = 25 cycles baking soda plus spray cleaner on brush
3 = Acetone and cotton ball
4 = Bleach plus cotton ball
5 = Not removed

TABLE 3. PHYSICAL PROPERTIES OF VINYL LAMINATE

Ultimate Tensile Strength	Tensile of Base Metal
Ultimate Elongation	Elongation of Base Metal
Tear Strength	Based upon Metal Thickness
Bend Brittle, ¼" rod	-30° C.
Reverse Impact	120 in. – lbs.
Heat Deformation (@120° C., 2000 gram load)	30% (1 side)
Shrinkage (5 minutes @ 250° F.)	0.6%

TABLE 4. ABRASION TESTS (Determined with a Taber Abrader using a CS-10 Wheel)			
Coating	***Mils. Coating Thick.***	***Total Revolutions***	***Revolutions per Mil. Coating Thick.***
Vinyl-Metal Laminate	4.0	8,430	2,108
Vinyl-Metal Laminate	8.5	17,156	2,100
Phenolic	1.25	1,204	1,000
Urea-Alkyd	1.70	122	72
Vinyl-Lacquer	2.0 Avg.	703-954	351-477

TABLE 5. WEATHER AGING (exposed to severe industrial atmosphere, 4.5 years, positioned south @ 45° angle)				
Vinyl-Metal Laminate	***Color***	***Chalking***	***% Reflectance***	***Discoloration***
181-34 Original	White	none	77	none
181-34 Aged	White	slight	67	slight
181-59 Original	Green	none	73	none
181-59 Aged	Green	none	78	none
181-71 Original	Blue	none	75	none
181-71 Aged	Blue	none	68	none
181-72 Original	Green	none	79	none
181-72 Aged	Green	none	66	slight

TABLE 6. CHEMICAL RESISTANCE DATA
(cup tests run @ 150° F.)

Solution	*Vinyl-Metal Laminate*		*Phenolic*		*Alkyd*	
	Exposed	*Result*	*Exposed*	*Result*	*Exposed*	*Result*
10% Sulfuric Acid	17 days	OK	2 days	failed	2 days	failed
10% Nitric Acid	17 days	OK	2 days	failed	2 days	failed
10% Hydrochloric Acid	17 days	OK	2 days	failed	2 days	failed
10% Acetic Acid	17 days	OK	2 days	failed	2 days	failed
10% Lactic Acid	17 days	OK	17 days	failed	2 days	failed
10% Formaldehyde	17 days	swelled	2 days	failed	2 days	failed
10% Caustic Potash	17 days	OK	3 days	failed	2 days	failed
Distilled Water	17 days	OK	17 days	OK	17 days	OK
Mineral Oil	17 days	OK	17 days	OK	17 days	OK
Ethanol	17 days	slight shrink	17 days	OK	17 days	OK

HEAT AGING

Following exposure to a temperature of 150° F. for 600 hours, Clad-Rex vinyl-metal laminate panels showed no loss of adhesion or tendency toward delamination. Some colors exhibited an insignificant amount of discoloration. As a result of these tests, it is expected that Clad-Rex vinyl-laminate will withstand even higher temperature without deterioration.

EXPOSURE TO MOISTURE

Panels of Clad-Rex vinyl-laminate, exposed for 1000 hours, with 100% relative humidity and at 160°F., showed no evidence of adhesion failure or blistering. Minor absorption of moisture caused a slight color change and loss of gloss. Panels exposed to intermittent water spray at ambient temperatures showed no deterioration after 1 year.

WEATHEROMETER TESTING

Tests were conducted to evaluate the laminates' resistance to chalking and discoloration. 500 hours exposure to ultraviolet in a Twinarc Weatherometer caused no perceptible chalking.

Company Mission Statement

Clad-Rex, Inc. is a business committed to the highest standards of excellence and integrity in its products, services, processes and relationships.

For our customers …
Clad-Rex's goals are to supply the highest quality products, on-spec, on-time, and on-budget. We will offer the best possible customer support with dependability, courtesy and friendliness.

For our suppliers …
Clad-Rex is committed to relationships based upon fairness, trust, mutuality, and longevity.

For our employees …
Clad-Rex is dedicated to honesty; a safe, friendly and nurturing workplace; employment security and professional growth; economic promise; and equality in opportunities and rights.

For our community and environment …
Clad-Rex will be a good neighbor and citizen, obeying the laws, protecting the environment, abiding by ethical conduct, and promoting human and business betterment.

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