



Product Brochure

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www.acttestpanels.com

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Introduction

About ACT Test Panels LLC

ACT Test Panels was founded in 1981 by four individuals from the metal finishing industry. Originally, ACT manufactured panels made from cold rolled steel and other specialty steels that were subsequently treated with phosphate chemicals. The fact that the panels matched the metal treatment specifications used by major domestic automotive, appliance, and metal office furniture manufacturers made them an obvious choice for testing purposes.

In 1984, ACT added an electrocoat (e-coat) painting process to expand the product offering. Electro-coating is a critical process that follows phosphate pretreatment in the automotive coating process and provides added corrosion resistance to metals. Today, virtually all automotive paints are applied over e-coated substrates. In practice, e-coated panels are used by a wide variety of industries to test primer surfacers, top coat paints, adhesives, and sealants.

To meet additional customer requirements, ACT added spray-painting capabilities in 1985 which expanded the panel product line to include panels containing primer and top coat paint systems. In 1992, ACT added a horizontal powder painting line to address the growing needs of the metal finishing industry.

From the start, ACT gained market share by focusing on customer service, decreasing delivery time, and increasing the array of substrate and coating options available to its growing customer base.

Today ACT manufactures over ten million panels each year to fulfill orders for its two successful product lines - ACT Test Panel and TRU Panel. The "ACT Test Panel" is our premium grade, fully pedigreed product which is used for performance, compatibility testing, and product certifications. The "TRU Panel" is our utility grade product which is used for spray outs, color appearance, and other cosmetic evaluations.

We are pleased to provide this document for your review and look forward to serving you!

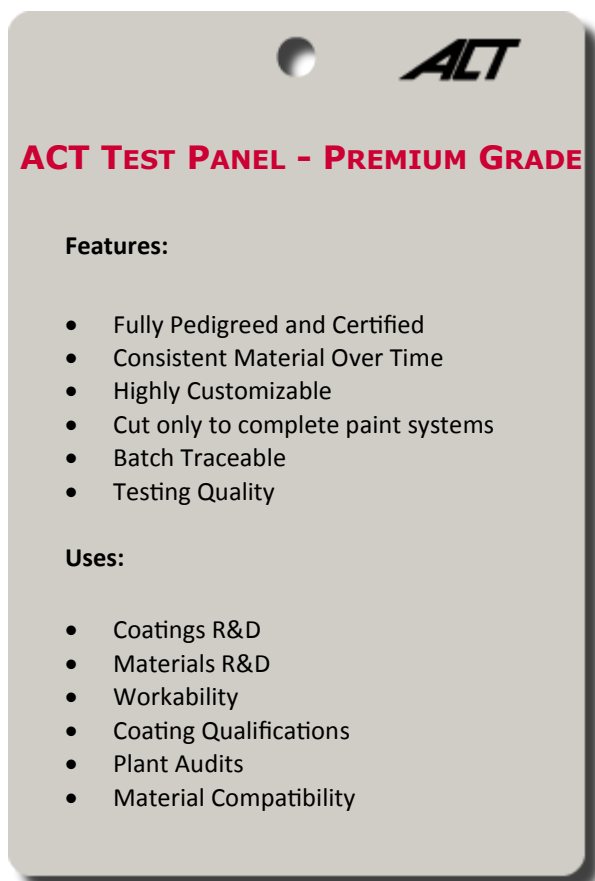


Product Line Basics

Panel Product Lines

Our customers have a broad range of needs and requirements when it comes to panels. That is why ACT offers two uniquely different panel product lines - "ACT Test Panels" and "TRU Panels". Both of these product lines were designed to address specific requirements and budgets. With this in mind, it is important to ask yourself which panel brand is the right choice for the job at hand. The diagram below provides a quick summary of the features and uses of each panel product line.

Which Panel Brand is Right for Your Next Job?



ACT

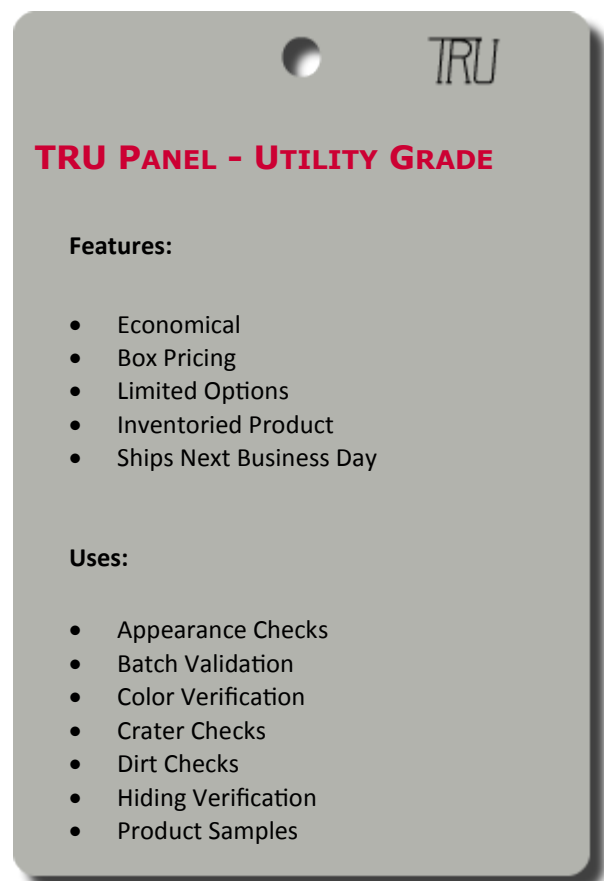
ACT TEST PANEL - PREMIUM GRADE

Features:

- Fully Pedigreed and Certified
- Consistent Material Over Time
- Highly Customizable
- Cut only to complete paint systems
- Batch Traceable
- Testing Quality

Uses:

- Coatings R&D
- Materials R&D
- Workability
- Coating Qualifications
- Plant Audits
- Material Compatibility



TRU

TRU PANEL - UTILITY GRADE

Features:

- Economical
- Box Pricing
- Limited Options
- Inventoried Product
- Ships Next Business Day

Uses:

- Appearance Checks
- Batch Validation
- Color Verification
- Crater Checks
- Dirt Checks
- Hiding Verification
- Product Samples

Beyond Panels...

ACT's product offering consists of more than just panels. In fact ACT offers a wide range of products beyond panels which ranges from appearance standards to lab supplies. These products are highlighted beginning at page 19 of this document.

In addition to products, ACT offers many services including compatibility testing, custom panel manufacture, and lab rental for scale up and feasibility testing. These services are described throughout this document.

If you have a need that is not covered in this document, please give us the opportunity to serve you!

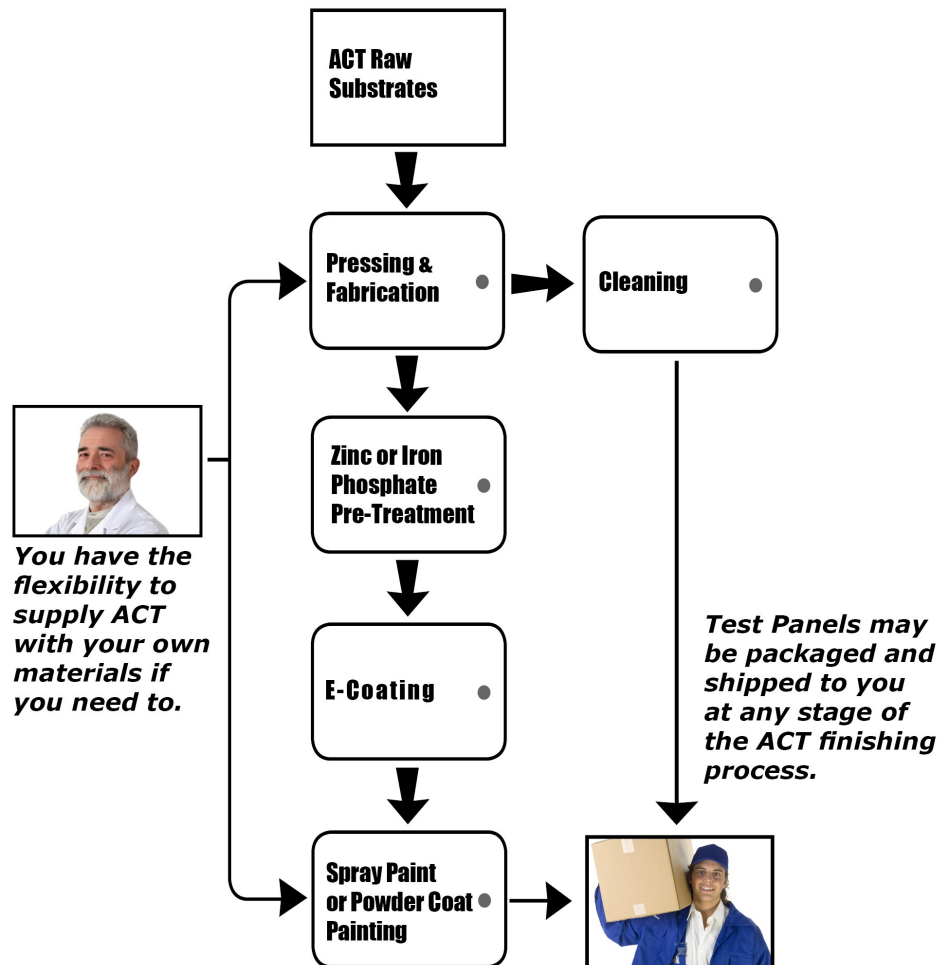
ACT Test Panels

Premium Grade

The “ACT Test Panel” is our premium grade, fully pedigreed panel which is commonly used for performance and compatibility testing, product certifications, and mission critical research and development efforts. When close enough isn't good enough, be sure to look for the ACT logo stamped on your panel.

The “ACT Test Panel” can be produced from a wide variety of substrates in just about any size and shape. Once a panel has been fabricated, there are many coating options to choose from as indicated in the diagram below. ACT Test Panels can be shipped to you from any step in our manufacturing process. ACT also provides professional services which allow our customers to supply their own material (substrate, pretreatment, paint, etc.) and insert it at any point in our process.

ONE-STOP SHOP FOR ANY PANEL SOLUTION



Over the next several pages, the common substrates, shapes, and coating options available in the ACT Test Panel product line will be described in greater detail. Above and beyond these common substrates and options, ACT offers custom panels and special order substrates. **For information about custom and special order panels, please contact one of our experienced customer service representatives by email (sales@acttestpanels.com) or phone (517) 439-1485.**

ACT Test Panels– Premium Grade

ACT Test Panel Substrates

Every “ACT Test Panel” begins by selecting a certified and pedigreed substrate. Below is a summary of our common substrates with the typical production sizes. As you review this information, please be reminded that many additional substrates are available as special order items.

Steel Panels

ACT Cold Rolled Steel (0.032)

ACT Cold Rolled Steel is one of our most popular substrates with a wide variety of uses within the metal finishing industry. This substrate is purchased from a single source and undergoes rigorous test procedures as part of our certification process to insure our customers with consistent and repeatable performance parameters from lot to lot.



Audit Cold Rolled Steel (0.032)

Audit Cold Rolled Steel involves a more extensive testing protocol than the ACT Cold Rolled Steel. This testing protocol adds two additional steps to the pedigree process by requiring an approval from the appropriate pretreatment supplier(s) which is followed by a review and approval from the appropriate automobile manufacturer(s). This substrate is typically used when a customer must evaluate their products on the exact automotive system that will be used in the real world.

Cold Rolled Rough Steel (0.032)

Cold Rolled Rough Steel has a higher Ra (roughness) for those customers who need to evaluate the appearance or performance of a paint system over rougher metal than our standard cold rolled steel.

Cold Rolled Plate Steel (0.060)

Cold Rolled Plate Steel was originally developed for threaded fastener drill, drive, and torque evaluations. It has also been found to be useful in coating and adhesive (lap shears and cross laps) evaluations where a thicker substrate is required.

Hot Rolled Steel (0.071)

Hot rolled steel is commonly used for structural shapes like brackets and reinforcements. This product is typically used when there is an interest in evaluating the performance of costing systems on this substrate.

Pre Primed Cold Rolled Steel (0.011 & 0.020)

Cold Rolled Steel starts with our standard cold rolled steel substrate which then receives a primer prior to being cut and shaped in the fabrication department. This process provides a more cost effective alternative to pretreated and primed (electrocoated or spray primed) cold rolled steel and is commonly used for evaluating paint appearance, crater checks, etc.

ACT Test Panels– Premium Grade

ACT Test Panel Substrates

Galvanized Steel Panels

Zinc Hot Dip Galvanized Unexposed (HDG70G70U) (0.030)

Cold Rolled Steel coils are passed thru a molten zinc bath to produce a minimized spangle zinc coating with a minimum coating weight of 70 g/m² on each side of the material. Typically used for unexposed surfaces such as under hood and under vehicle.

Zinc Hot Dip Galvanized Exposed (HDG60G60E) (0.031)

Cold Rolled Steel coils are passed thru a molten zinc bath to produce a minimized spangle zinc coating with a minimum coating weight of 60 g/m² on each side of the material. Typically used for exposed (exterior) surfaces such as closure panels and body skins.

Zinc Electro Galvanized (EZG60G60E) (0.030)

Cold Rolled Steel coils are passed thru a multi stage electroplating process to produce a zinc coating with a minimum coating weight of 60 g/m² on each side of the material. Typically used for exterior automotive applications.

Zinc/Iron Hot Dip Galvanized (HIA45A45) (0.031)

Cold Rolled Steel coils are passed thru a molten zinc bath followed by a high temperature oven to produce an alloy coating composed of zinc and iron with a minimum coating weight of 45 g/m² on each side of the material. Typically used for exterior automotive applications.

Zinc/Iron Electro Galvanized (EIA30A45) (0.030)

Cold Rolled Steel coils are passed thru a multi stage electroplating process to produce an alloy coating of zinc and iron with a minimum coating weight of 30 g/m² on one side and 45 g/m² on the other side. Typically used for exterior automotive applications.



Stainless Steel Panels

SS304

SS304 is the most common grade of stainless steel containing 18% chromium and 8% nickel. Outside of the US this material is commonly known as A2 stainless steel in accordance with ISO3506.

SS316

SS316 is the second most common grade of stainless steel containing 16% chromium, 10% nickel, and 2% molybdenum. This material is widely used by the food and medical industries. This material is also sometimes referred to as marine grade stainless steel. Outside of the US this material is commonly known as A4 stainless steel in accordance with ISO3506.

SS430

SS430 is a decorative grade of stainless steel with good formability but with reduced temperature and corrosion resistance compared to SS304 and SS316. This material is commonly used for decorative trim in the automotive industry.

ACT Test Panels– Premium Grade

ACT Test Panel Substrates

Cast Metal Panels

Aluminum A356 (0.24)

Aluminum Alloy A356 is the industry standard for casting aluminum due to its resistance to hot cracking, solidification, and shrinkage. This versatile alloy has good machining properties and can be solution heat treated. Good choice for both sand and permanent mold castings. In the automotive world this alloy is commonly used for the manufacture of wheels.

Aluminum A380 (0.125)

A380 aluminum alloy is widely used for casting general-purpose die castings. It has good mechanical properties and is used in hundreds of applications including air brake castings, housings, gear cases, air-cooled cylinder heads, brackets and structural components.

Gray Cast Iron (0.20)

Gray Cast Iron is an iron alloy characterized by its relatively high carbon and silicon content. Due to its flake like crystal structure, this material is quite brittle. Typically used in the automotive industry for components such as cylinder blocks and heads, flywheels, pistons, brake drums, and clutch plates.

Ductile Cast Iron (0.20)

Ductile Cast Iron is an iron alloy containing magnesium or cerium which results in the formation of spherical nodules rather than the flake like structure of the gray cast iron. This spherical crystal structure inhibits the creation of cracks providing the enhanced ductility that gives the alloy its name. Known for its good machinability and high ductility, this material is commonly used in the manufacture of suspension parts, differential cases, and crankshafts.

Magnesium (0.125)

AM60B & AZ91D Alloys:

Magnesium is a common material for applications where weight saving is a priority, having the lowest density of all structural metals. Almost as light in weight as plastic, magnesium has the advantage of greater strength and rigidity, durability, and heat-dissipation.

Zinc (0.125)

Zinc is a common alternative to machined, pressed, stamped, and fabricated items due to its high strength and hardness. Commonly used in the automotive industry for electrical housings and door handles.



ACT Test Panels– Premium Grade

ACT Test Panel Substrates

Aluminum Panels



Pre-Primed Aluminum

Aluminum with a pre-applied primer which provides a more cost effective alternative to pretreated and primed (electrocoated or spray primed) aluminum. Used for paint appearance evaluations, color standards, crater checks, etc.

Aluminum Alloys

Aluminum alloys are a homogenous mixture of two or more elements, at least one of which is aluminum, and are often mixed with copper, zinc, manganese, silicon, or magnesium. They are much lighter and more corrosion resistant than steel, but not quite as corrosion resistant as pure aluminum. Common alloys are listed below, although many others are available as special order items.

Aluminum 2024T3	Aluminum alloyed with copper and a tensile strength of 3.
Aluminum 3003H14	Aluminum alloyed with manganese and a hardness of 14.
Aluminum 5052H32	Aluminum alloyed with magnesium and a hardness of 32.
Aluminum 6016T4	Aluminum alloyed with magnesium and silicon and a tensile strength of 4.
Aluminum 6022T43	Aluminum alloyed with magnesium and silicon and a tensile strength of 43.
Aluminum 6061T6	Aluminum alloyed with magnesium and silicon and a tensile strength of 6.
Aluminum 6111T43	Aluminum alloyed with magnesium and silicon and a tensile strength of 43.
Aluminum 6451T4	Aluminum alloyed with magnesium and silicon and a tensile strength of 4.
Aluminum 7075T6	Aluminum alloyed with zinc and a tensile strength of 6.
Aluminum X610	Specialized aluminum alloy used in automotive applications.
Aluminum X611	Specialized aluminum alloy used in automotive applications.

ACT Test Panels– Premium Grade

ACT Test Panel Substrates

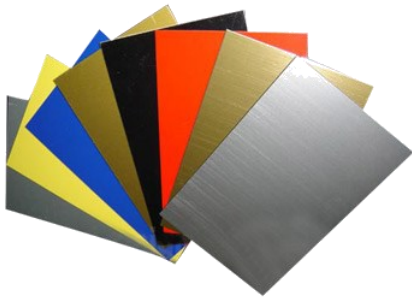
Blast Cleaned

ACT offers standardized panels constructed from both hot rolled and cold rolled steel that have been blast cleaned. We offer a variety of common panel sizes with a near white surface profile of 2 ± 0.5 mils. Panels are wrapped in VCI paper then shrink wrapped to provide the most consistent blast panel possible.

Item Number	Size	Panels/Pkg	Item Number	Size	Panels/Pkg.
56655	3x5x071	10	58999	3x5x125	5
58980	3x6x071	10	59000	3x6x125	5
56223	4x6x071	10	59001	3x9x125	5
56074	4x8x071	10	59002	4x6x125	5
56274	4x12x071	10	59003	4x8x125	5
58996	2x2x125	5	59004	4x10x125	5
58997	2x4x125	5	59005	4x12x125	5
58998	2x5x125	5	59006	6x12x125	5



Plastic— Special Order



Plastic panels are available in a variety of substrates with different uses and properties. The typical automotive plastics offered are listed to the right.

ABS	Acrylonitrile Butadiene Styrene
Nylon	Nylon (filled or unfilled)
Polycarbonate	Polycarbonate
PPO	Polyphenylene Oxide
RIM	Reaction Injection Mold
RRIM	Reinforce Reaction Injection Mold
SMC	Sheet Molded Compound
TPE	Thermoplastic Elastomer
TPO	Thermoplastic Olefin
TPP	Thermoplastic Polyesters
TPU	Thermoplastic Urethane
TSU	Thermoset Urethane

ACT Test Panels– Premium Grade

Common Sizes by Substrates (Others Available as Custom Orders)

	01x03"	01x04"	03x05"	03x06"	03x08"	03x10"	04x04"	04x06"	04x08"	04x12"	04x18"	06x12"	10x10"	12x12"	12x18"
ACT Cold Rolled Steel (.026" Thick)		•	•	•				•	•	•					
ACT Cold Rolled Steel (.032" Thick)		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Audit Cold Rolled Steel								•	•	•					
Cold Rolled Rough Steel								•		•					
Cold Rolled Plate Steel	•	•								•					
Hot Rolled Steel								•		•					
Coil Coated Cold Rolled Steel										•				•	
Zinc Hot Dip Galvanized		•						•	•	•				•	
Zinc Eletro Galvanized		•						•	•	•				•	
Zinc/Iron Hot Dip Galvanized		•						•	•	•				•	
Zinc/Iron Electro Galvanized		•						•	•	•				•	
Coil Coated Aluminum			•	•				•		•					•
Aluminum 2024T3						•									
Aluminum 3003H14			•	•				•	•	•					•
Aluminum 5052H32								•	•	•					
Aluminum 6022T43															•
Aluminum 6061T6								•	•	•					
Aluminum 6111T43															•
Cast Aluminum A356								•							
Cast Aluminum A380								•							
Cast Iron Gray								•							
Magnesium - Die Cast								•							
Zinc - Die Cast								•							
Stainless Steel								•							

ACT Test Panels– Premium Grade

Special Shapes

The “ACT Test Panel” can be manufactured in more shapes than a simple square or rectangle. Over the years, dozens of “Special Shapes” have been developed to meet the highly specific needs of our customers. Below you will find a brief description and picture of each of the common special shapes sold today.

** Special Shapes with an asterisk denote products which can be constructed with customer supplied metal substrates, adhesives, and/or sealers.*

Abrasion

These panels are used for accelerated wear action testing to measure abrasion resistance of coatings. They are designed to fit the Taber® Abrasers. The standard ACT smooth edges and rounded corners provide improved handling safety to this test method.

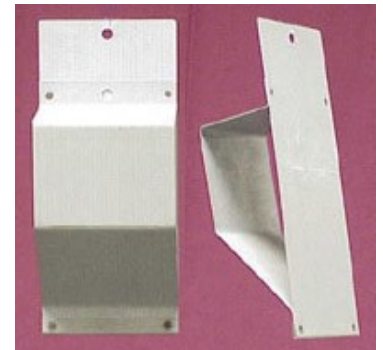
Our standard abrasion panels are made from cold rolled steel although other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Box Interior Cavity *

This configuration is designed to simulate body cavities found in doors, deck lids, tailgates, and other box type assemblies. These panels are used to test various paint system applications such as film overbuild effect on exterior surfaces and corrosion resistance along interior cavities and seams. Ends may be opened or closed.

These panels can be constructed of any metal combination, single or bimetallic. Available untreated, phosphated, electrocoated, primed, or topcoated.



Coach Joint *

These test panels simulate support joints where exposed surfaces of differing substrates form potential corrosion sites. Coach Joints are typically constructed from two panels of different metals joined together at a 90 degree angle along the side with five spot welds.

Bimetallic assemblies are available untreated, phosphated, electrocoated, primed, or topcoated. A typical configuration is cold-rolled steel and galvanized steel such as G60, however, any combination may be specified.



ACT Test Panels– Premium Grade

Special Shapes Continued

Domes

These panels are used for paint demonstrations to show color effect on curved surfaces.

We offer Dome Panels in 6", 12" and 16". These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Drip Rail *

This configuration simulates the roof joint where the upper body is attached to the roof forming the gutter or drip rail. This area requires a special sealing operation to prevent water and sound intrusion. These panels are used to evaluate sealers before and/or after treatment.

Drip Rail Panels are constructed using 3 panels joined at the base of a 1/2" deep gutter. The panels are joined with spot welds. The configuration has an overall size of 4" x 24". Any metal combination, single or bimetallic, can be specified for this configuration.



Edge Corrosion Blades

This panel is used to evaluate edge corrosion protection for various coating systems, such as ecoat. Edge Corrosion Blades are constructed of steel, 3/4" x 4" - available as untreated or zinc phosphated.



Hemflange Seam Joint *

These Panels are designed to test difficult corrosion sites that occur along seams found in doors and deck lids. These Panels are constructed from two 4" panels joined with a 3/4" crimp seam joint and two spot welds. The top panel is bent to a 40 degree angle 3/4" from the seamed edge. Reverse Hemflange Panels are also available.

Typical Bimetallic Assemblies are made from cold rolled steel and hot dip or electro galvanized steel. Other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Lap Joint - End to End *

Using two different steels, End to End Lap Joints are constructed from two panels overlapped end to end and joined with three spot welds.

Lap Joint Panels are available untreated, phosphated, electrocoated, primed, or topcoated. A typical configuration is cold-rolled steel and galvanized steel such as G60, however, any combination may be specified.



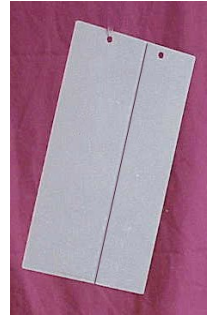
ACT Test Panels– Premium Grade

Special Shapes Continued

Lap Joint - Side to Side *

Using two different steels, Side to Side Lap Joints are constructed with two panels overlapped side to side and joined with 5 spot welds.

Lap Joint Panels are available untreated, phosphated, electrocoated, primed, or topcoated. A typical configuration is cold-rolled steel and galvanized steel such as G60, however, any combination may be specified.



Leading Edge Chipping Panel

These test panels simulate the leading edge of automobiles, such as the hood. The angles represent the aerodynamic angle typical of today's designs. This panel is used to evaluate chipping resistance of coatings on a leading edge. A corrugated panel which fits the gravelometer window is attached to one end of a 4"x12" base panel. The corrugated panel has peaks 0.8" crest-to-crest and 0.4" high. Angles are 135 degrees to the base panel with a 270 degree leading edge.

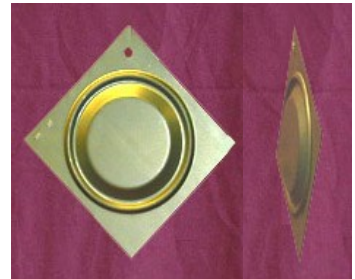
Available untreated, phosphated, electrocoated, primed, or topcoated. These panels are typically made from cold rolled steel, however, other types of metal can be used upon request.



Marciniak Cup

The Marciniak Cup is designed to simulate a formed section of a car body, particularly in Gravelometer tests. The form of this panel is stiffer than a flat steel test panel and does not deform causing more energy to be absorbed by the coating which results in a more severe and more realistic chipping test. This panel can also be used to evaluate the adhesion of metallic coatings, such as galvanized or galvaneal, to the steel substrate.

These test panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Sag Bend

This panel has body styling lines combined with trim holes to simulate production applications. Its special configuration is used to evaluate sag and run down properties of paint. Each panel has a contoured styling bend 2" wide by 1.5" high with holes 0.25" in diameter.

Panel sizes include 12"x9", 12"x12", and 12"x18" and are typically constructed of cold rolled steel. Other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



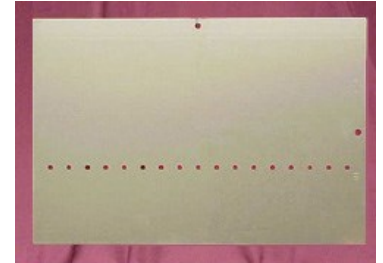
ACT Test Panels– Premium Grade

Special Shapes Continued

Sag Flat

This panel with holes simulates flat body surfaces where trim moldings, handles, and lockcylinders are mounted. Its special configuration is used to evaluate sagging and run down properties of paint.

Panel sizes include 4"x18", 12"x12", 12"x18", and 12"x24" and are typically constructed of cold rolled steel. Holes are 0.25" in diameter on 1" centers. Other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Snap Off— Adhesive

Individual test strips are manufactured such that the test surface on one side and at one end has no burred edges to interfere with the adhesive bond during testing. The test surface itself remains undisturbed since grinding or de-burring is not part of the process.

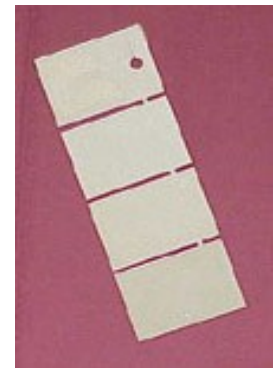
These adhesive panels are made from cold rolled steel and come in 1"x4" or 2"x3" snap off segments. Other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Snap Off - Weathering

Each panel is blanked to a configuration that provides four individual test coupons which can be readily snapped apart for testing as needed. These panels are designed to fit into fluorescent light exposure apparatus and controlled condensation cabinets.

Weathering Panels are constructed of cold rolled steel panels pre-cut into four 2"x3" identically processed test coupons. Other types of metal are available. These panels are available untreated, phosphated, electrocoated, primed, or topcoated.



Space Frame Enclosed Box *

This is an enclosed assembly designed to simulate the space frame construction of an automobile. It is used to evaluate coatings for their ability to provide corrosion protection in this type of configuration and environment. This special shape is also useful in evaluating structural foam performance.

The Space Frame Box Section has an overall dimension of 9"x14.5" x3". It is constructed from a 9"x14.5" base panel, two 6"x14.5" box panels, and two 6"x3" end panels. Each end panel has a 1" diameter hole. These can be produced in any metal combination, and are available untreated, phosphated, electrocoated, primed, or topcoated.



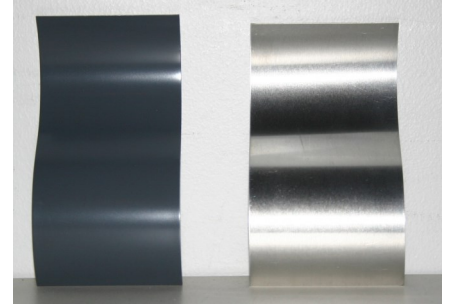
ACT Test Panels– Premium Grade

Special Shapes Continued

S-Curve Panel

This panel simulates curves found in real world objects. They are ideal for emphasizing the powder coating itself as well as the quality and craftsmanship of a custom coater. In addition to display, special shape panels may also be used to train, experiment or improve efficiency of coating curved objects.

S– Curve Panel are 3"x6"x.025" and are constructed of aluminum. These panels are offered in both bare 3003H14 and also pre-primed. They can be manufactured with or without a hole.



Weld Bead Panel

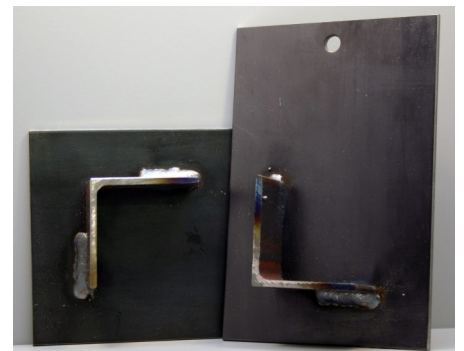
This specialty panel was designed to assist in the evaluation of the performance of coatings over weld beads and the surrounding weld area. Our standard weld bead panels measure 3x6" and may be constructed from either Cold Rolled or Hot Rolled Steel. If your project requires a panel smaller or larger than our standard 3x6", we can custom manufacture a weld bead panel in any size to fit your needs.



L-Angle Welded Panel

This specialty panel was designed to assist in the evaluation of the performance of coatings over welded angles. These panels are customizable to the length and location of the weld on the angle bracket.

Our standard L-Angle welded panels measure 3x6" and may be constructed from either Cold Rolled or Hot Rolled Steel. If your project requires a panel smaller or larger than our standard 3x6", we can custom manufacture a L– Angle weld bead panel in any size to fit your needs.



ACT Test Panels– Premium Grade

ACT Test Panel Coating Options

There are many potential steps involved in the process of manufacturing a full paint system “ACT Test Panel”. At the end of each step along the way, a panel can be delivered to you, the customer, or down the line to the next step in the process within our facility.

Cut Only

Cut only panels are just what the name implies - cut only. These panels will contain the rust preventative oils used in the manufacture of the substrate from the mill. (Coil coated materials are the are an exception to this rule)

Cleaned

Cleaned panels are subjected to a cleaning and drying process according to ASTM D609 C prior to packaging. This process intentionally excludes the application of additional corrosion inhibitors, which make these panels ideal for sensitive evaluations such as mill oils, rust preventatives, and pretreatments. The removal of rust preventative oils

Pretreatment - Phosphate Coating

ACT premium brand test panels are manufactured from specially selected, high quality metal substrates to ensure the required consistency and reliability for product development programs. Phosphate can be applied by a spray or immersion process as specified.

Zinc Phosphate

Various zinc phosphate options are available including a chromic sealer rinse, non-chromic sealer rinse, and a final fresh de-ionized water rinse prior to forced drying. Individual stages of the phosphate process can be varied by contracting for prototyping services.

Iron Phosphate

Standard iron phosphate panels can be processed with a chromic sealer rinse, non-chromic sealer rinse, and a final fresh de-ionized water rinse prior to forced drying. However, they can be ordered without the de-ionized water rinse.

Commonly Available Phosphate Treatments

Zinc Phosphate Spray	Bonderite [®] 37, Bonderite [®] 952, Bonderite [®] 3410, and Chemfos [®] 710
Zinc Phosphate Immersion	Bonderite [®] 958, Bonderite [®] 3080, Bonderite [®] 3020, Bonderite [®] CD10, and Chemfos [®] 700
Iron Phosphate Spray	Bonderite [®] 1000, Bonderite [®] 1030, Bonderite [®] 1070

Commonly Available Sealers

Chrome Sealers	Parcolene [®] 60 and Chemseal [®] 18
Non-Chrome Sealers	Parcolene [®] 90, Parcolene [®] 91, Parcolene [®] 99x, and Chemseal [®] 59

ACT Test Panels– Premium Grade

ACT Test Panel Coating Options Continued

Pretreatment - Conversion Coating

Commonly Available Conversion Coatings

Aluminum Spray Treatments	Alodine [®] 407, Alodine [®] 600, Alodine [®] 1500, Alodine [®] 5200
Pre-Treat Thin Film (Nano Technologies)	Zircobond [®] Duratec [®] 100

Electrocoat

Panels may also be ordered with a cathodic electro-deposition (electrocoat, ecoat, elpo, or electrophoretic) paint system. These panels are automotive approved and offer several advantages over in-house primed panels. Since electrocoat prime painted panels from ACT follow the complete automotive finishing cycle (substrate preparation, phosphate coating, and prime painting) in a single controlled facility, variability due to handling, shipping, and exposure is eliminated.

Commonly Available Electro Deposition Paint Systems

BASF	U32AD500 U32AD500F U32AD800 U32AD520	PPG	ED6060C ED6060CZ ED6100C ED6280 ED6450 HE ED6550 G KAI ED6650 ED6750 CA ED6750 S Powercron [®] 590 Powercron [®] 6000CX Powercron [®] 8000
Axalta	Cormax [®] VI KAI Cormax [®] NA Cormax [®] 6 Cormax [®] 6 EP EC3000AM ES21 ES27		

Spray Painting

ACT's spray painting system incorporates automated digitally controlled Spraymation machines to assure the accuracy, consistency, and repeatability of the spray operation. Capabilities include the application of primers, enamels, two component materials, waterborne coatings, basecoat / clearcoat systems, and powder applications.

ACT Test Panels works closely with the major OEM and aftermarket paint manufacturers such as BASF, Axalta, PPG, Sherwin Williams, Akzo Nobel, Rohm Haas, and Valspar to coordinate supply of specific paint systems for your panel needs.

Powder Painting

ACT's custom horizontal powder coating line was specifically designed for the production of test panels. Through the use of this automated system, ACT is able to produce extremely consistent panels with a wide range of film builds and finishes.

ACT Test Panels works closely with the major OEM and aftermarket paint manufacturers to coordinate supply of specific paint systems for your panel needs.

ACT Test Panels– Premium Grade

Common Coating Options by Substrate

	Cut Only	Clean	Pretreatment	Electrocoat	Spray	Powder
ACT Cold Rolled Steel (.026" Thick)	•	•	•	•	•	•
ACT Cold Rolled Steel (.032" Thick)	•	•	•	•	•	•
Audit Cold Rolled Steel	•	•	•	•	•	•
Cold Rolled Rough Steel	•	•	•	•	•	•
Cold Rolled Plate Steel	•	•	•	•	•	•
Hot Rolled Steel	•	•	•	•	•	•
Coil Coated Cold Rolled Steel	•				•	•
Zinc Hot Dip Galvanized	•	•	•	•	•	•
Zinc Electro Galvanized	•	•	•	•	•	•
Zinc/Iron Hot Dip Galvanized	•	•	•	•	•	•
Zinc/Iron Electro Galvanized	•	•	•	•	•	•
Coil Coated Aluminum	•				•	•
Aluminum 2024T3	•	•	•	•	•	•
Aluminum 3003H14	•	•	•	•	•	•
Aluminum 5052H32	•	•	•	•	•	•
Aluminum 6022T43	•	•	•	•	•	•
Aluminum 6061T6	•	•	•	•	•	•
Aluminum 6111T43	•	•	•	•	•	•
Cast Aluminum A356	•		•		•	•
Cast Aluminum A380	•		•		•	•
Cast Iron Gray	•		•		•	•
Magnesium - Die Cast	•		•		•	•
Zinc - Die Cast	•		•		•	•
Stainless Steel	•		•		•	•

TRU Panels– Utility Grade

TRU Panel Basics

The “TRU Panel” is our utility grade, economy panel which is designed specifically for appearance evaluations. TRU Panels are available cleaned or iron phosphated and are ready to use without additional cleaning or preparation. While not well suited for testing purposes, TRU Panels are a convenient low cost solution for spray out, flow, color match, and coverage evaluations in your quality control process. Every TRU Panel is subjected to our detailed inspection process which begins with the selection of raw materials and is carried thru to the finished product.

TRU Panels— Cleaned

Every TRU Panel starts with our TRU Cold Rolled Steel (CRS) substrate. This substrate has a consistent matte finish which is produced through an industry standard process.

The panel production process includes cleaning the TRU Cold Rolled Steel according to ASTM D609C. The panels are cut to size, a 5/16” hole is punched at the top, and a TRU logo is stamped into the material.

After inspection, panels are wrapped in quantities of 25 with VCI paper (vapor phase inhibitor), shrink wrapped, and then packaged in boxes.

TRU panels are sold by the box. The number of panels in a box varies by panel size. For information concerning the number of panels in a box, please refer to the tables on the right.

Description	Item Number	Size (Inches)	Units Per Box
Cold rolled steel (SAE 1008/1010)	APR47817	3 x 5 x 0.032	250
	APR47818	3 x 6 x 0.032	250
	APR51288	3 x 9 x 0.032	125
	APR51289	4 x 4 x 0.032	250
Matte finish	APR47819	4 x 6 x 0.032	200
	APR10331	4 x 8 x 0.032	125
	APR10332	4 x 12 x 0.032	100
	APR18360	6 x 12 x 0.032	100

Description	Item Number	Size (Inches)	Units Per Box
Cold rolled steel (SAE 1008/1010)	APR53555	2 X 3.5 X 0.020	500
	APR18646	3 x 5 x 0.020	250
	APR21659	3 x 6 x 0.020	250
	APR26570	3 x 9 x 0.020	150
Smooth finish	APR19033	4 x 6 x 0.020	250
	APR19971	4 x 8 x 0.020	200
	APR17268	4 x 12 x 0.020	150
	APR21914	6 x 12 x 0.020	150

TRU Panels– Utility Grade

TRU Panel Basics

TRU Panel— Iron Phosphated

Iron Phosphated TRU panels are manufactured from the same TRU Cold Rolled Steel substrate as the cleaned panel.

Once the panel is cut, punched and stamped then it is processed in our 8 stage conveyor phosphate line.

The TRU iron phosphated panel is pretreated with Bonderite® 1000, a widely used industrial iron phosphate system.

Description	Item Number	Size (Inches)	Units Per Box
TRU Steel Panels coated with Bonderite 1000 (iron phosphate) and Parcolene 60 sealer.	APR47813	3 x 6 x 0.032	250
	APR20301	4 x 6 x 0.032	200
	APR47335	4 x 12 x 0.032	100

Description	Item Number	Size (Inches)	Units Per Box
TRU Tinplate Steel Panels	APR53713	2 x 3.5 x 0.010	1000
	APR53712	3 x 5 x 0.010	1000
	APR51826	3 x 6 x 0.010	500
	APR51827	4 x 12 x 0.010	200

TRU Panel— Tinplate Steel

TRU Panel— Aluminum

Description	Item Number	Size (Inches)	Units Per Box
Aluminum 3003 H14	APR51836	2 x 3.5 x 0.025	500
	APR51837	2 x 4 x 0.025	450
	APR51838	3 x 5 x 0.025	500
	APR51839	3 x 6 x 0.025	500
	APR51840	3 x 9 x 0.025	150
	APR51841	4 x 6 x 0.025	250
	APR51842	4 x 8 x 0.025	150
	APR10343	4 x 12 x 0.025	125
	APR21371	6 x 12 x 0.025	125

Additional Services

Special Projects & Services

ACT provides special projects and services for thousands of customers. As the diagram on page 4 illustrates, we assist our customers in evaluating their products within our controlled system by allowing them to supply their own material for treatment in any step of our process at ACT. Whether you are evaluating a new substrate, pretreatment, paint, or other coating, ACT will work with you to evaluate your product. The information below describes some of our more common special projects and services.

Spray and Powder Painting Projects

ACT also makes its facilities available to our customers for specially designed spray painting test programs which require unique control of film build, cure temperatures, or combinations of products from multiple suppliers. Most major brands of automotive original equipment finish and refinish materials can be applied by ACT. Complex projects including statistically designed experiments with careful documentation of all application and cure parameters can be performed in full confidence at ACT facilities. The panels matrix can be supplied by the customer or provided by ACT's skilled paint engineers who are able to draw from their extensive experience at automotive companies and the supplier community.

Plastic Panel Painting Projects

ACT has the ability to prepare plastic panels for testing and evaluation. In addition to the facilities previously described, we are also able to power wash plastic plaques prior to painting. This ensures a surface preparation most like the conditions that exist in actual production with all the monitoring expected for a laboratory product development program. Plastic plaques that will be exposed to electro deposition and bake conditions in production

Compatibility Testing Services

ACT provides compatibility testing services for any product that may come into contact with the paint process. Our laboratory is equipped with prototype phosphate and e-coat tanks and state of the art spray and powder booths.

Compatibility Testing is critical for many of our customer's R&D efforts. The reality is that any component of a product intentionally or inadvertently present during the paint process has the potential of causing adverse effects on the coating such as cratering, fish eyes, or film distortion.

The following is a list of materials which are commonly evaluated in our compatibility testing lab:

- Mill Oils
- Rust Preventatives
- Pre Lubes
- Blank Wash
- Draw Compounds
- Adhesives
- Sealers
- Deadeners
- Maintenance Lubricants
- Hygiene Products (deodorant, hair spray, etc.)

ACT Test Services

A2LA Accredited Testing Cert. #2745.01 ISO/IEC 17025:2005

In addition to panel production, we have an in-house accredited laboratory. The laboratory performs tests on material such as: paint, electrocoat, sealers and adhesives, metal forming lubricants, metal substrates, phosphateability and compatibility.

Test

Test Methods

Abrasion

Falling Sand

ASTM D968 (Method A); GMW15487

Taber

ASTM D4060; Ford BN 108-02, BN 108-04; SAE J948 (Procedure 3)

Accelerated Corrosion

Chipping Corrosion

Chrysler LP-463PB-52-01

Cyclic Corrosion

Ford BI 123-01, BI 123-03; CETP 00.00-L-467; GM 9505P (Cycle J) superseded1 (12/01/10), GM 9540P superseded1 (12/01/10); GMW14124 (Cycle J), GMW14872; SAE J2334

Filiform Corrosion

ASTM D2803

Scab Corrosion

GM 9511P; GMW15288; IEEE (ANSI) C57.12.28 (Annex A)

Appearance

Multiangle Color

ACT WIL-0152

Gloss

ASTM D523

DOI

ACT WIL-0151

Wavescan (R, LW, SW, Wa-We, Dullness)

ACT WIL-0151

Phosphate (Macro), Crystal Size (Micro)

ACT WIL-0146

Briggs & Stratton

Label Specification 97K

Chemical Resistance

Fuel

GM 9500P, GM 9501P superseded1 (8/01/10); GMW14333

Solvent

ASTM D2792

Fluids

Caterpillar MG1004-151; Chrysler LP-463PB-31-01; GMW14334, GMW14701 (except Method 1); IEC 60068-2-74

Chip Resistance

Gravelometer

ASTM D3170; SAE J400; GM 9508P superseded1 (8/01/10); GMW14700

ACT Test Services

A2LA Accredited Testing Cert. #2745.01 ISO/IEC 17025:2005

Test	Test Methods
Coatings Evaluation	
Blisters	ASTM D714; ISO 4628-2
Corrosion	ASTM D610; Chrysler CS-Corrosion; GM 8101G superseded1 (12/01/09); GMW15357; ISO 4628-3
Corrosion Creep Back	ASTM D1654; GM 9102P; GMW15282; ISO 4628-8
Defect Rating	ASTM B537; ISO 4628-1
Coating Thickness	
	ASTM D7091, B487; Ford BI 117-01; ISO 2808 (Sections 4.3, 5.3, 5.4.4.1, 5.5.7, 5.5.8)
Coatings Weight	
Wet Strip	GM 9733P
X Ray Fluorescence	ACT WIL-0144
Compatibility	
Lubricant	ACT WIL-0122, WIL-0147; ASP Auto/Steel Partnership Sections 3 and 5-7; Chrysler LP-463NB-29-02, LP-463PB-63-01; Freightliner 49-00102; GM 9532P, GM 9611P, GM 9612P, GM 9617P; GMW16546; Nissan NNA Oil Approval test; PPG QWI 0604.0
Sealer/Adhesive	ACT WIL-0149, WIL-0150; Chrysler LP-463CB-12-02, LP-463CB-12-03, LP- 463CB-12-04, LP-463NB-09-01, LP-463PB-59-02; GM 3623M (Draft 05/06), GM 3624M (Draft 03/08), GM 9901P
Paint	ASTM D925 (Method A); Chrysler LP-463PB-59-01; GME8555
Silicone Contamination	Chrysler LP-463PB-13-01
Electrocoat	Ford BV 119-01; GM/Opel Test Method J-18 (02/99); SAE J1969
Phosphate	Toyota TSH1109G

ACT Test Services

A2LA Accredited Testing Cert. #2745.01 ISO/IEC 17025:2005

Test

Test Methods

Cure Test

ASTM D5402 (Method A); GM 9509P

Electrocoat (ECOAT)

Ford BI 120-01; GM 9535P

Electroplate

Adhesion

ASTM B571 (Section 7, 8, 9)

Environmental Cycling

Temperature Range (-70 to 500) *C
Humidity Range (10 to 95)% RH \pm 5%

Chrysler LP-463PB-22-01;
GM 9505P (Cycles A, C, F, G, I, K, L, O) superseded1 (12/01/10);
GMW14124 (Cycles A, C, F, G, I, K, L, O, U, V, W)

Flexibility

Mandrel

ASTM D522

Hardness

Pencil

ASTM D3363; ISO 15184

Gardner Impact

ASTM D2794

Paccar

CMT0033 (except 9.26 and 9.29)

Paint Adhesion

Tape

ASTM D3359; Ford BI 106-01; GM 9071P;
GMW14829, GMW14170 (Table 1, 4.2.2); ISO 2409

Dime Scrape

GM 9506P

Thumbnail

GM 9507P

Pull-Off Strength

ASTM D4541 (Method D, PATTI and E, Positest)

Loop Scrape

ASTM D2197

ACT Test Services

A2LA Accredited Testing Cert. #2745.01 ISO/IEC 17025:2005

Test

Test Methods

Salt Spray

Neutral (NSS)	ASTM B117, G85 (Annex A1); Ford BI 103-01; GM 4298P; GMW3286; ISO 9227; JIS Z2371
Acetic Acid	ASTM G85 (Annex A1)
Copper Accelerated Salt Spray (CASS)	ASTM B368; GMW14458

Sealers/Adhesives

Paint Staining	Chrysler LP-463NB-09-01
Sag	Ford BV 118-01
Wash Resistance	Ford BV 116-01, BV 116-02, BV 116-03 (Ambient Temp)

Tensile (Up to 45kN)

Lap Shear	SAE J1523; ISO 4587
Cross Lap	GM 9753P
T Peel	ASTM D1876

UV Exposure

ASTM D4587, G154

Water Resistance

Water Fog	ASTM D1735; GM 4465P; GMW14729 (Option A)
Condensing Humidity	ASTM D2247
Water Immersion	ASTM D870; Ford BI 104-01; GME60410 superseded1 (1/26/09); GMW14704
Cleveland Condensing Humidity	ASTM D4585; Ford BI 104-02; ISO 6270-1

Additional Products

Orange Peel & Powder Smoothness Standards

ACT's product offering consists of more than just panels. In fact ACT offers many non-panel products ranging from appearance standards to lab supplies. Over the next 4 pages you will find individual product descriptions and images. For ordering information, please contact customer service by email at sales@acttestpanels.com or phone at (517) 439-1485.

Orange Peel and Powder Smoothness Standards

ACT manufactures sets of panels with graduated degrees of orange peel (flow) and powder smoothness from rough to smooth. Thousands of customers use these panels to visually evaluate the appearance of painted parts using a consistent, known standard. Each set consists of ten 4x6 inch panels which are painted black and labeled with their corresponding orange peel (flow) rating or powder smoothness from 1 to 10. *THESE PANELS ARE VISUAL STANDARDS ONLY.*



ACT Orange Peel Standards

These panels are reproduced from the same master set as the automotive grade sets; however, no numerical readings or independent (third party) review is performed. They are useful as internal standards where no comparison must be made with a particular automotive manufacturer's certified standards.

Chrysler Orange Peel Standards

These panels are reproduced from the same master set and then approved by Chrysler for use by their suppliers in evaluating the appearance of painted parts.

Ford Orange Peel Standards

These panels are reproduced from the same master set and then approved by Ford Motor Company for use by their suppliers in evaluating the appearance of painted parts.

GM Orange Peel Standards

These panels are reproduced from the same master set and approved by General Motors for use by their suppliers in evaluating the appearance of painted parts.



Member of
The Powder Coating Institute

PCI Standards— Powder Smoothness

Developed by 'The Powder Coating Institute' and produced by ACT, these panels represent the degrees of smoothness achievable with powder coatings and are considered the benchmark for smoothness within the powder coating industry.

Additional Products

Automotive Specialties

Automotive Color Standards



Color standards are used by materials and component suppliers to the automotive industry to manufacture products that visually duplicate, or match, a particular color. When a material or component is to be used directly on a car, it is necessary to match the color to a certified standard. Certified standards have been carefully measured and visually approved for color as compared to a “Master Standard” held by the auto company. For viewing the general color type, a display color standard is usually acceptable.

Ford Motor Company

ACT has been designated by Ford Motor Company to sell and distribute the following types of annual program color standards:

- Certified Exterior Color Standards
- Primer Color Standards
- DSO Fleet
- Display Exterior Color Standards

Hiding Panel

This coated cold rolled steel hiding panel is an excellent low cost alternative to paper hiding and spray out cards. Unlike paper products, this hiding panel will not curl or yellow with time.

Many body shops have begun using this panel as the final step in verifying a color match before moving forward with painting expensive body parts. Some shops have even decided to document specific paint formulation and settings on the back side of the panel creating their own color library.



Additional Products

Testing Supplies

Mass Loss Coupons

The use of mass loss coupons (also known as weight loss coupons) is required by many cyclic corrosion standards including GM9540P, SAEJ2334, and the new GMW 14872 for the validation of the corrosivity produced during your cyclic corrosion test. The mass loss coupons from ACT Test Panels are manufactured in accordance with the specifications detailed in the above standards. Each steel coupon measures 1 x 2 x 0.125 " and is stamped with an alpha numeric ID. A 1/4" hole is drilled through the center of each coupon for mounting to the coupon holder.



Mass Loss Coupon Holder

The method for holding mass loss coupons in your tests is also detailed within the cyclic corrosion standards. The coupon holder from ACT Test Panels is manufactured in accordance with these specifications. The mass loss coupon holder fits conveniently in our panel racks and trays and holds up to 8 coupons. It is constructed of a non-metallic 4 x 12 panel and includes 8 nylon fasteners.



Grit Trough Solution Mix

The Grit Trough Solution Mix contains the appropriate mass of each of the solid contaminants according to the GMW 14872 standard. The solid contaminants consist of Fire Clay, Cinders, Sand, and Block Mix and are pre-measured to make final mixing simple. Just add 5 gallons of water and salt as specified by the standard.



Ford Cross Hatch Panel

This panel is used as a cross cut guide for tape adhesion per the Ford standard BI-106 -1. This precision machined nickel plated steel template is used with a carbide tipped scribe tool. The template consists of two guides, one guide to produce the 3mm (1/8") cuts and one guide to produce the diagonal cuts exactly bisecting the grid.



Additional Products

Testing Supplies

Angled Coupon Holder

The angled coupon holder includes one self-standing non-metallic holder and 8 non-metallic bolts, nuts, and spacers. This product is free standing with a fixed layback angle according to GM specifications



Scribe Tool

30° Carbide tipped scribe tools are used in a wide variety of tests including:

ASTMD1645 | FORD BI 123-01 | SAE J2334 | GM9102P | GMW15282



Scribe Table

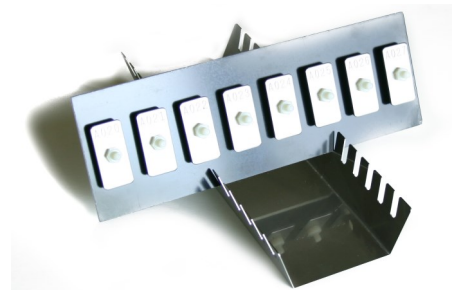
ACT Test Panels manufactures a custom built table which allows you to safely scribe your test panels with accuracy. This sturdy and dependable design includes features such as a maple "butcher block" top, metal table legs with holes for floor mounting and precision bearings for smooth operation.



Panel Rack

Stainless Steel

Panel racks are available in either stainless steel. The rack holds up to 15 panels.



Panel Envelopes & Boxes

Panel envelopes are used to keep your test panels safe while providing a convenient place to record detailed testing information. Available in 4" x 12" only.

Panel Boxes are available in a variety of sizes. Many customers request additional boxes for the safe storage of audit and quality control panels.

