



SAMPLE ENGINEERING SPECIFICATION

Coupled Weigh-in-Motion (WIM) 2000 Series Scale Applications

1. PART 1 - GENERAL

1.1. Scope. This section sets forth the requirements for Legal for Trade Coupled Weigh-in-Motion (WIM) Rail Scale system for in-motion rail car weighing applications. The scales shall be furnished and installed complete as specified in the following paragraphs, including platform, foundation, load cells, instruments, surge voltage protection system, and the services of the manufacturer's service representative.

1.1.1. Acceptable Manufacturer. The legal for trade scales furnished under this section shall be manufactured by Fairbanks Scales or equal.

1.2. General. Equipment furnished and installed under this section shall be assembled, erected, and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by the Engineer.

1.2.1. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section.

1.2.2. Governing Standards. The scale systems are subject to an issued National Type Evaluation Program, (N.T.E.P) certificate, as well as American Association of Railroads (AAR) compliance is required. Additionally, scale system shall conform to the following federal, state, local, and industrial standards.

- National Institute of Standards and Technology (NIST), Handbook 44, "Specifications, Tolerances, and Technical Requirements for Weighing and Measuring Devices.
- AAR
- Applicable state regulations for commercial weighing devices.
- American Welding Society AWS D1.1, 2008.
- Weighbridge structural steel and structural steel embedment's shall conform to ASTM A36.
- Reinforcing steel shall conform to ASTM A615, Grade 60.

1.2.3. Anchor Bolts. All anchor bolts, nuts, and washers shall be made of carbon steel or comparable and may be plated.

1.2.4. Edge Grinding. Sharp projections of cut or sheared edges of ferrous metals, which are not to be welded, shall be ground as required to ensure paint adherence.

1.2.5. Surface Preparation. All ferrous metal surfaces, except stainless steel or plated steel, shall be blast cleaned in the shop in accordance with the paint

manufacturer's recommendations. All mill scale, rust, and contaminants shall be completely removed before shop primer is applied. The components of each module shall be cleaned to an SSPC-SP6 finish prior to painting.

1.2.6. Shop Painting. All steel surfaces, except stainless steel or plated steel, shall be coated with a PPG AUE-370 high solids acrylic urethane, a two component chemically cross-linked commercial coating system. The paint system will be applied per the manufacturer's recommendations. See attached data sheet.

Additional field painting other than touchup painting of damaged surfaces will not be required.

1.2.7. Power Supply. Unless otherwise specified, the power supply to the equipment will be a dedicated 120 volt, single phase, 60 Hz connection. Where control voltages lower than the power supply voltage is required, suitable control power transformers shall be furnished.

1.2.8. Surge Voltage Protection. The scale system shall be surge and lightning protected. This protection shall include a surge protection device which plugs into a standard 115 VAC outlet. The load cells shall be optically isolated, and surge protected. Electrical diagrams of the scale grounding and surge protection shall be supplied with submittals. The surge voltage package shall be provided as a unit and be tested and approved by the scale manufacturer.

Surge protection devices or components not designed or tested by the scale manufacturer as a unit are unacceptable.

1.3. Submittals. Complete foundation and installation drawings, together with detailed specifications and data covering materials, parts, devices, and accessories forming a part of the equipment furnished, shall be submitted in accordance with the submittals section. Drawings shall cover all scale components, foundation details, and pier loading information necessary for the design of the scale foundation or installation.

2. PART 2 – PRODUCTS

2.1. Scale Design

- 2.1.1. General Description.** The scale shall be a Fairbanks' WIM 2000 Series Rail Scale system consisting of a single 12' 6" 2000 Series Module with Rocker Column load cells and rigid checking. All associated live and dead rail hardware components shall be included with the scale system.
- 2.1.2. Scale Capacity and CLC.** Scale shall have a minimum capacity of 85 tons and meet NTEP Certificate of Conformance for Rail Scale.
- 2.1.3. Weighbridge Design.** Each scale platform shall be single module equaling 12' 6" in length. Each platform is a structural I-beam design with main I-beam directly under each rail.
- 2.1.4. Checking.** Each scale platform will be checked with a rigid checking system designed to prevent the module from moving while in use. The checking system shall also include embedded bump-post design to act as secondary checking and as safety posts.
- 2.1.5. Load Cell and Junction Box Specifications.** The scale shall have rocker column load cells. Each rocker column load cell shall have a minimum gross rated capacity of 50 tons each. The load cells shall be constructed of stainless steel and shall be completely hermetically sealed to prevent moisture from entering the cell. Load cells shall be nitrogen filled to retard internal corrosion. Load cells shall meet the following specifications:

Design	Rocker column
Load cell construction:	
Can.....	17-4 PH Stainless steel
Minimum capacity:	50t (110,000 lbs.)
Maximum Height:	7"
Protection:	NEMA 6P/IP69K
Load cell resistance (ohms):	1,000
Rated Output (mV/V):	2.0
Sealing:	Hermetically sealed; gas filled, cable entry sealed by glass to metal header
NTEP Accuracy Class:	IIIL, 10,000 divisions

The load cell shall be provided with a shielded, 4 conductor cable with a polyurethane jacket. Load cell cable to include stainless steel sheathing. Load cell cables must be hard wired to the load cell. "Quick disconnect" load cell cable connectors on cells or on junction boxes are not acceptable.

Humidity0 to 100% non-condensing
Accuracy Class III/IIIL
Approval NTEP CC# 20-060

2.6 Web interface accessible PC System Must be designed to drive a dedicated web interface from the instrument. Web interface must be capable of the following functions:

- Enable/disable the scale system
- Show NTEP CC#
- Display active weights and speed of each car as it crosses scale
- Read and display RFID tag information from each car
- Running log of train weighments tying car RFID tag with weight and speed

3. PART 3 – EXECUTION

3.1. Installation. The scale shall be manufactured, provided, and installed by a scale company that has a minimum of five years of experience installing similar rail scale systems.

The installer shall configure the scale system as indicated on the certified drawings. All deck concrete flat work finishing shall be performed utilizing high-quality techniques conforming to American Concrete Institute standards as set forth in ACI CP-10 and shall be supervised by an ACI certified concrete flatwork technician. Anchor bolts shall be set as required by the scale manufacturer's drawings.

3.2. Manufacturer's Field Services. Where scheduled in the equipment schedule section, an experienced, competent, and authorized representative of the manufacturer shall provide field services for equipment furnished under this section. Field services shall meet the requirements of Manufacturer's Field Services in the quality control section.

3.3. Field Testing and Acceptance. An authorized manufacturer's representative shall provide the required scale certification for capacity and accuracy to the Engineer as required by the applicable state department of weights and measures and any other applicable state or county agency.

3.4. Personnel Training. An experienced, competent, and authorized representative of the manufacturer shall train the Owner's personnel in operating, maintaining, and repairing the equipment specified in this section. The training provided shall meet the requirements of Personnel Training Services in the quality control section. The number of training sessions and duration of each session shall be as scheduled in the equipment schedule section.

End of Section



DTM Polyurethane

AUE-370

AUE-370 is a surface tolerant, high solid, high build, two component acrylic urethane formulated for direct-to-metal applications. The product is easy to mix and apply for airless or air-assisted spray applications.

This product is compliant for applications in areas with VOC requirements of less than 2.8 lbs/gal (340 g/l).

Features and benefits:

- Apply direct-to-metal
- Airless or Air-assisted application capable
- 2.8 VOC capable

Associated Products:

- AUE-3501, 2K High Solids Urethane Hardener
- GXH-1086, Urethane Hardener
- UA-11, Urethane Accelerator

Physical Constants*:

	With AUE-3501	With GXH1086
Weight per gallon (US)	9.43 - 10.50 lbs/gal	9.33 - 10.35 lbs/gal
Percent solids (by weight)	61.0 - 68.2%	59.5 - 66.7
Percent solids (by volume)	57.0 - 61.3%	55 - 59.1%
Flashpoint	86°F (30°C) – AUE-370	86°F (30°C) – AUE-370
VOC	2.25 - 2.65 lbs/gal (RTS, unreduced)	2.44 - 2.8 lbs/gal (RTS, unreduced)
HAPs	< 0.1 lbs/gal (RTS, unreduced)	< 0.1 lbs/gal (RTS, unreduced)
Photo-chemically reactive	Non-Photochemically Reactive	Non-Photochemically Reactive

* Constants vary from color to color

Directions for Use:

Substrate Preparation:

The surface to be coated must be free of all contamination (including moisture, dust, dirt, oil, grease, and oxidation). Substrate preparation has a direct relationship to the performance of a coating.

SSPC-SP15 Commercial Grade Power Tool Cleaning is minimum preparation, this includes but is not limited to a 1.0 mil blast profile minimum.

Commercial Blast Cleaning is recommended (SSPC-SP6, NACE #3) to maximize adhesion and performance properties of the finished coat.

Variability can occur with substrates, preparation, application method or environment. We recommend that adhesion and system compatibility be checked prior to full application.

Metal	Direct to Substrate
Cold Rolled Steel	Recommended
Hot Rolled Steel	Recommended
Galvanal	Recommended
Galvanized	Recommended
Aluminum	Recommended
Plastic / Fiberglass	Not Recommended.

Note: For acceptable compatibility between this topcoat and CPC primers please see the CPC Primer/Topcoat compatibility chart (CPCB01).



AUE-370

Directions for Use (continued)

Mix Directions:



Mix Directions Stir thoroughly before and occasionally during use.
 Mix component "A" AUE-370 Color thoroughly before blending. Once component "B" is added, product must be adequately mixed prior to use. A mechanical mixer is recommended. UA-11 may be added, if desired, up to 6 oz / RTS GAL.
Use with adequate ventilation. Keep out of reach of children.

Thinning: Up to 10% Q70 (MAK) can be added to RTS AUE-370 where VOC regulations allow. Thinning in this manner will not exceed 3.5 VOC as applied.



Blend Ratio: w/AUE-3501:	Without UA-11		With UA-11		
	AUE-370	AUE-3501	AUE-370	AUE-3501	+ UA-11
	5	1	5	1	6oz. / RTS Gal



Pot Life @ 77°F: 2 - 3 hours 1 - 2 hours

Spray Viscosity Range: 30 - 40 sec. #3 EZ Zahn 20 - 30 sec. #3 Zahn EZ



Blend Ratio: w/GXH-1086:	Without UA-11		With UA-11		
	AUE-370	GXH-1086	AUE-370	GXH-1086	+ UA-11
	4	1	4	1	6oz. / RTS Gal



Pot Life @ 77°F: 2 - 3 hours 1 - 2 hours

Spray Viscosity Range: 25 - 35 sec. #3 Zahn EZ 20 - 30 sec. #3 Zahn EZ

Application Equipment:



Conventional: 1.6 - 2.0 mm fluid tip, 50 - 65 psi
Conventional on Pressure Pot: 1.3 - 1.8 mm fluid tip, 12 - 20 ounces per minute fluid
HVLP: 1.4 - 1.8 mm fluid tip, maximum psi per gun MFG settings
HVLP on Pressure Pot: 1.3 - 1.8 mm fluid tip, 12 - 20 ounces per minute fluid
Airless: .013 - .017 fluid tip, 2000 psi and up fluid pressure
Air-Assisted Airless: .013 - .017 fluid tip, begin at 1400 psi fluid & minimum required air pressure to remove tails from pattern
Brush or Roll: High Quality Natural Bristle Brush
 High Quality 3/8" nap roller cover with a solvent resistant core
Electrostatic: Information above incorporated with gun MFG settings

Application:



Apply: 1 - 2 coats
Recommended Wet Film Build: 5.0 - 8.5 mils
Recommended Dry Film Build: 3.0 - 5.0 mils
Coverage (varies by color): 915 - 982 sq. ft. at 1.0 mil dry film per U.S. gallon

Dry Times:



Air Dry @ 77°F 50% RH:	Without UA-11	With UA-11
To Texture	3 - 5 hours	1 - 2 hours
To Handle	8 - 12 hours	2 - 4 hours
Recoat	Min, When Dry Through Max. 7 days	Min, When Dry Through Max. 7 days

Paint film is not fully cured for 7 days. Drying time listed may vary, depending upon film build, color selection, temperature, humidity and degree of air movement.

AUE-370

Technical Data*

Performance Properties:

Test	ASTM Method	Without UA-11	With UA-11
Pencil Hardness	ASTM D3363	H-2H	H-2H
Impact (direct)	ASTM D2794	80"lbs	80"lbs
Mandrel	ASTM D522	1/8" No Cracks	1/8" No Cracks
Chip Resistance	ASTM 3170	8	8
Gloss - 60°	ASTM D523	85 - 92	85 - 92
Adhesion	ASTM D3359 Method B	5B	5B

Chemical Resistance:

Chemical ASTM D1308	Without UA-11	With UA-11
Xylene	Slight Swell - recovers	Slight Swell - recovers
10% NaOH (Sodium Hydroxide)	No Effect	No Effect
10% HCl (Hydrochloric acid)	No Effect	No Effect
10% H ₂ SO ₄ (Sulphuric acid)	No Effect	No Effect
10% HNO ₃	Slight Stain	Slight Stain
Hydraulic Oil	No Effect	No Effect
Gasoline	Slight Swell - recovers	Slight Swell - recovers
Diesel Fuel	No Effect	No Effect
Water	No Effect	No Effect

Weather Resistance:

	ASTM Method	Without UA-11	With UA-11
Salt Spray – 1000 hours	B117		
Corrosion Creep	D1654	7A - 8A	7A - 8A
Face Blisters	D714	None	None
Adhesion	D3359 Method A	10A	10A
Humidity – 100 hours	D2247		
5 Minute Recovery Adhesion	D3359 Method B	5B	5B
1 Hour Recovery Adhesion	D3359 Method B	5B	5B
24 Hour Recovery Adhesion	D3359 Method B	5B	5B
QUV-UVA: 60° angle	D4587		
500 hour retention	D523	98%	98%
1000 hour retention	D523	98%	98%
QUV-UVB: 60° angle	D4587		
500 hour retention	D523	90%	90%
1000 hour retention	D523	65%	65%

All tests results assume proper cure and preparation of test substrates. Unless otherwise stated, all results were obtained spraying product direct to metal on HRS with Commercial Blast Cleaning (SSPC SP6), and product color is black. QUV tests were performed over B1000 steel.

* The application and performance property data above are believed to be reliable based on laboratory findings. It is for the buyer to satisfy itself on the suitability of the product for its particular use. Variation in environment, procedures of use, or extrapolation of data may cause unsatisfactory results.

Safety:



These materials are designed for application only by professional, trained personnel, using proper equipment under controlled conditions and are not intended for sale to the general public.

Safe application of paints and coatings requires knowledge of equipment materials and individual training. Directions and precautionary information on both equipment and products should be carefully read and strictly observed for personal safety and property protection. Consideration must be given to eliminate conditions, which may generate hazardous atmospheres during spray application or subject operators or bystanders to injury or illness.

Special precautions must be taken when utilizing spray equipment, particularly airless equipment. High-pressure injection of coatings into the skin by airless equipment may cause serious injury requiring immediate medical attention at a hospital. Treatment advice may also be obtained from Poison Centers.

Air quality should be maintained with adequate ventilation; applicators can achieve additional protection by wearing respirators and other protective garments such as gloves and overalls. In all cases, wear protective eye equipment. During the application of all coatings materials, all flames, welding and smoking must be prohibited. Explosion proof equipment must be used when coating these materials in confined areas.

PRECAUTIONARY INFORMATION

Before using the products listed herein, carefully read each product label and follow directions for its use. Please read and observe all warnings and precautionary information on all product labels. Prevent all contact with skin and eyes and breathing of vapors and spray mist. Repeated inhalation of high vapor concentrations may cause a series of progressive effects including irritation of the respiratory system, permanent brain and nervous system damage and possible unconsciousness and death in poorly ventilated areas. Eye watering, headaches, nausea, dizziness and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

KEEP OUT OF THE REACH OF CHILDREN

MEDICAL RESPONSE

Emergency Medical or Spill Control Information (412) 434-4515; CANADA (514) 645-1320
Have label information available.



Material Safety Data Sheets for the PPG products mentioned in this publication are available through your PPG Distributor.

For additional information regarding this product, see the MSDS AND LABEL information.

PPG Industries Commercial Coatings

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