

GALFAN[®]

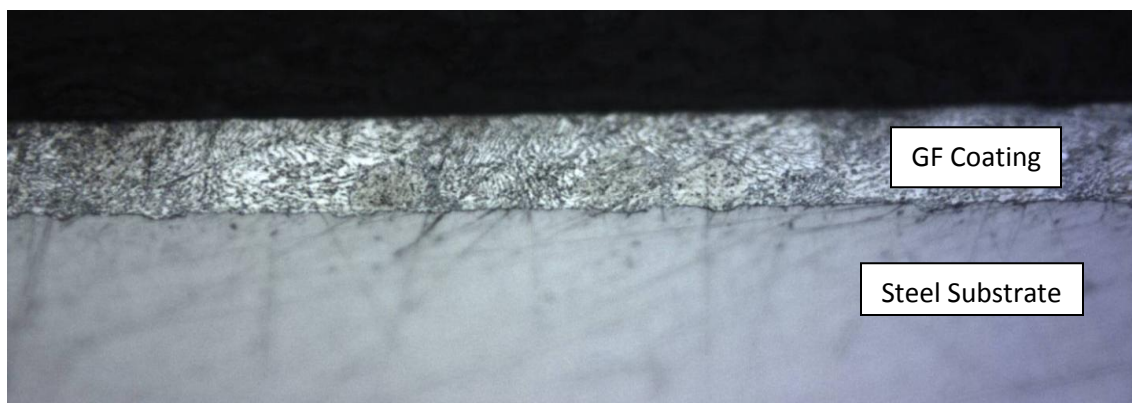
Superior Corrosion Protection

5% aluminum, 95% zinc

GALFAN

General Information

- 5% Aluminum, mischmetal (rare earth elements Ce, La), balance zinc – ASTM A875/A875M-10
- Eutectic Lamellar Microstructure – very thin alloy layer with alternating “plates” of zinc rich and aluminum rich areas creating sacrificial and barrier protection against corrosion



- Surface Appearance
 - No traditional spangle – faint cellular “honeycomb” structure
 - Low Coefficient of Friction – very smooth surface conducive to deep draws

Physical Properties

Coating	Density	Thickness	Coatings
Galvanized	0.258 lb/in ³	1 oz/ft ² = 0.00168”	G60 = 0.60 oz/ft ² , etc.
Galfan	0.238 lb/in ³	1 oz/ft ² = 0.00175”	GF60=0.60 oz/ft ² , etc.

Coating	GF20	GF30	GF45	GF60	GF75	GF90
Thickness	0.0004”	0.0005”	0.0008”	0.0011”	0.0013”	0.0016”

Corrosion Performance

- Approximately 50% more white rust protection compared to standard Galvanized
 - Double white rust corrosion protection at same oz/ft² – galvanic protection
 - Increased red rust corrosion protection at same oz/ft² – barrier protection
 - Salt spray studies conducted on Techs produced Galfan (photos attached)
- Equivalent Corrosion Protection
 - GF20 to G40
 - GF30 to G60
 - GF45 to G90

Environmental / Cost Benefit

- Reduced coating weight for same corrosion performance
 - Reduction in use of zinc resources
 - Lower coating cost
 - Reduction of finished gauge by coating thickness can be achieved on many end-uses – no loss of mechanical/physical properties, increased footage per ton

Paint Adhesion

- Excellent paint adhesion
 - Techs-produced Galfan painted at several locations, different paint systems
 - Passed all quality testing without issue
 - Zinc phosphate pretreatments not recommended for extended runs at this time – possible issues with elevated aluminum in bath – under review

Cracking / Flaking Performance

- Very thin alloy layer and lamellar microstructure resists crack propagation
- Lubricity of smooth surface resists flaking in forming and drawing applications

Sustainability

Excerpt below from EPA Resource Conservation website: <http://www.epa.gov/smm/basic.htm>

Sustainable materials management (SMM) is a systemic approach to using and reusing materials more productively over their entire lifecycles. It represents a change in how our society thinks about the use of natural resources and environmental protection. By examining how materials are used throughout their lifecycle, an SMM approach seeks to:

- Use materials in the most productive way with an emphasis on using less;
- Reduce toxic chemicals and environmental impacts throughout the material life cycle;
- Assure we have sufficient resources to meet today's needs and those of the future.

The Case for a Lifecycle Approach to Materials Management

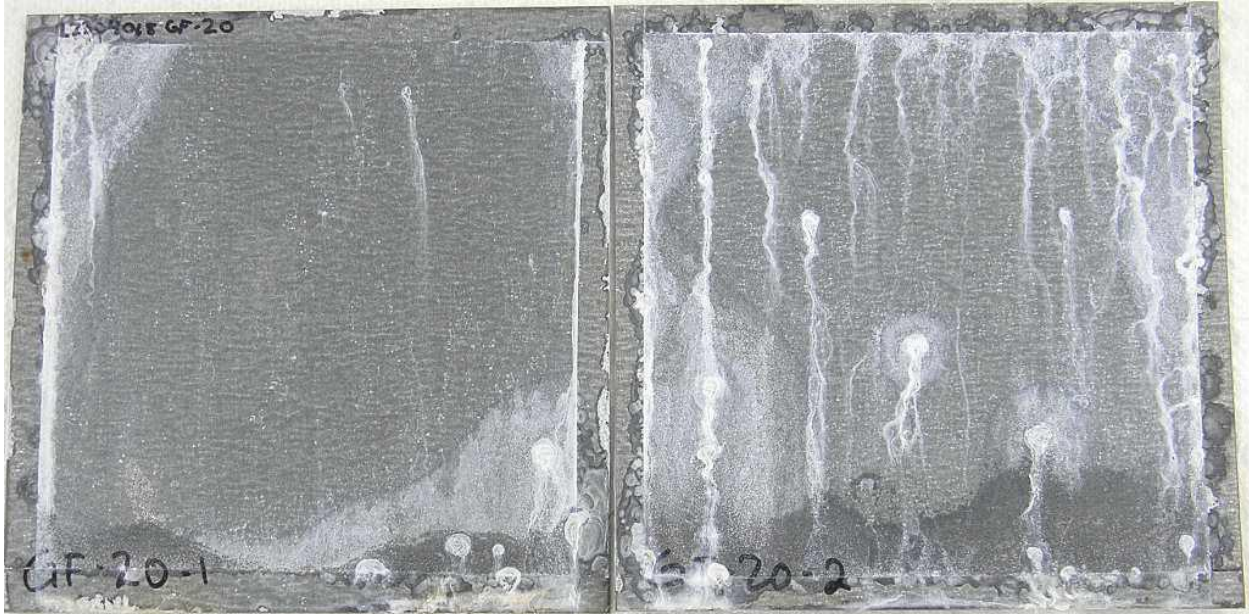
How our society uses materials is fundamental to our economic and environmental future. Global competition for finite resources will intensify as world population and economies grow. More productive and less impactful use of materials helps our society remain economically competitive, contributes to our prosperity and protects the environment in a resource-constrained future.



Galfan and Sustainability

Galfan truly epitomizes the goals of SMM – “*Use materials in the most productive way with an emphasis on using less...*” and “*Assure we have sufficient resources to meet today’s needs and those of the future*” through the following:

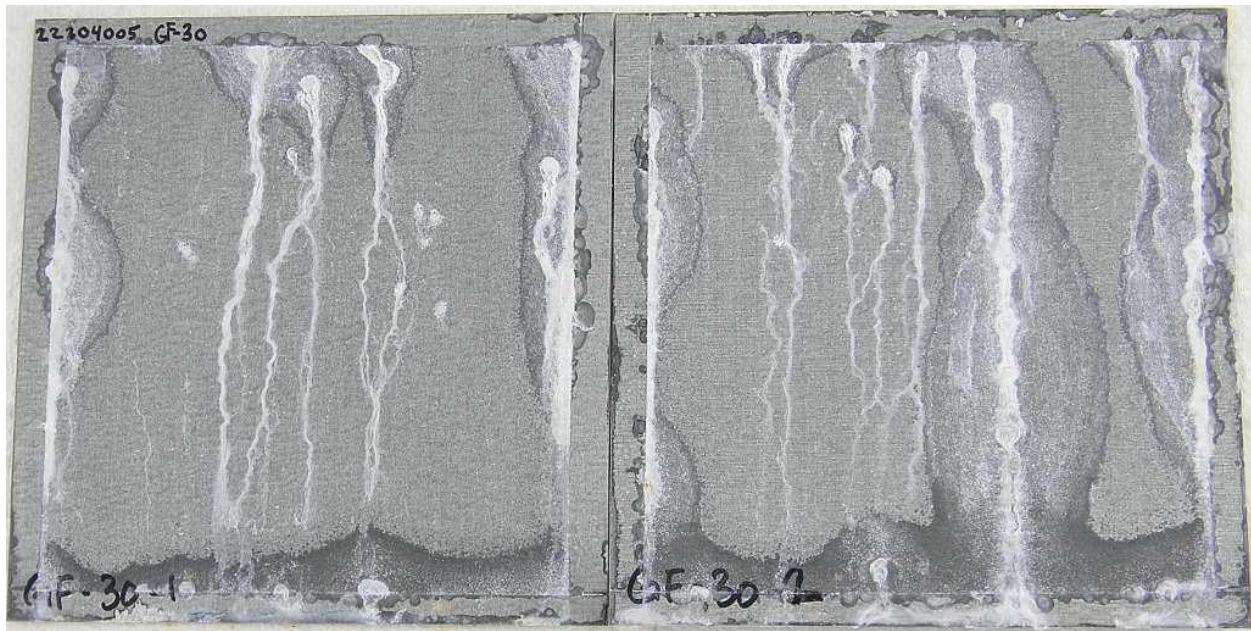
- Zinc consumption reduced by fifty percent with, at least, equal corrosion protection
 - Equivalent Coatings (based on standard ASTM coating weights)
 - GF20 vs. G40
 - 0.20 oz/ft² Galfan / 0.40 oz/ft² standard Galvanized
 - GF30 vs. G60
 - 0.30 oz/ft² Galfan / 0.60 oz/ft² standard Galvanized
 - GF45 vs. G90
 - 0.450 oz/ft² Galfan / 0.90 oz/ft² standard Galvanized
 - Achieve double the white rust (sacrificial) protection at same oz/ft²
 - Delayed white rust means even greater red rust (barrier) protection at same oz/ft²
- Reduced electricity consumption for Galfan bath (lower melting point)
 - GF – 820° F average bath temperature
 - GI – 870° F average bath temperature
 - 6% higher sustained temperature needed versus Galfan
 - Increased zinc usage = increased charging of zinc pigs = increased electricity consumption of bath to maintain temperature
- In some cases, reduction in finished gauge (decreased by coating thickness) can increase lineal footage / square footage per ton, thereby reducing consumption of total weight needed for a given project.
 - Examples based on 0.020” x 48.00” 100 ton, 61,275 lineal feet
 - G40 converted to GF20
 - Coating thickness change of 0.0003”
 - New finished gauge of 0.0197”
 - New lineal footage of 62,208 or 1.5% increase
 - G90 converted to GF45
 - Coating thickness change of 0.0007”
 - New finished gauge of 0.0193”
 - New lineal footage of 63,492 or 3.6% increase



22304018 .012" GF20 - 1008 hrs Salt Spray – ASTM B117



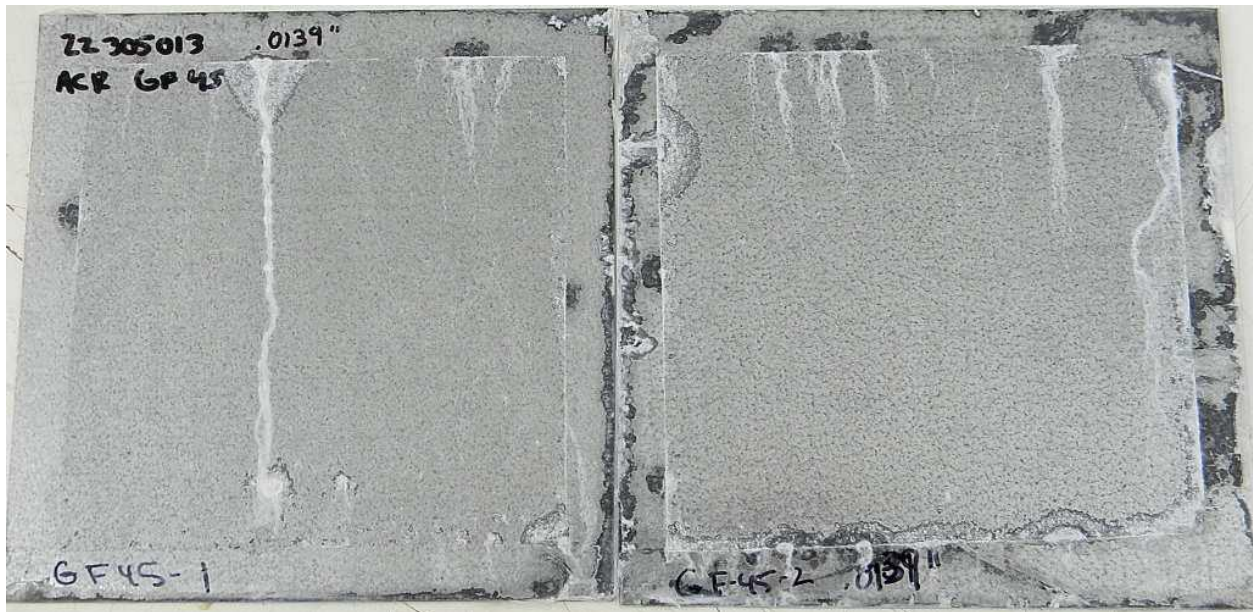
22311054 .0117" G40U - 1008 hrs Salt Spray – ASTM B117



22304005 .0125" GF30 - 1008 hrs Salt Spray – ASTM B117



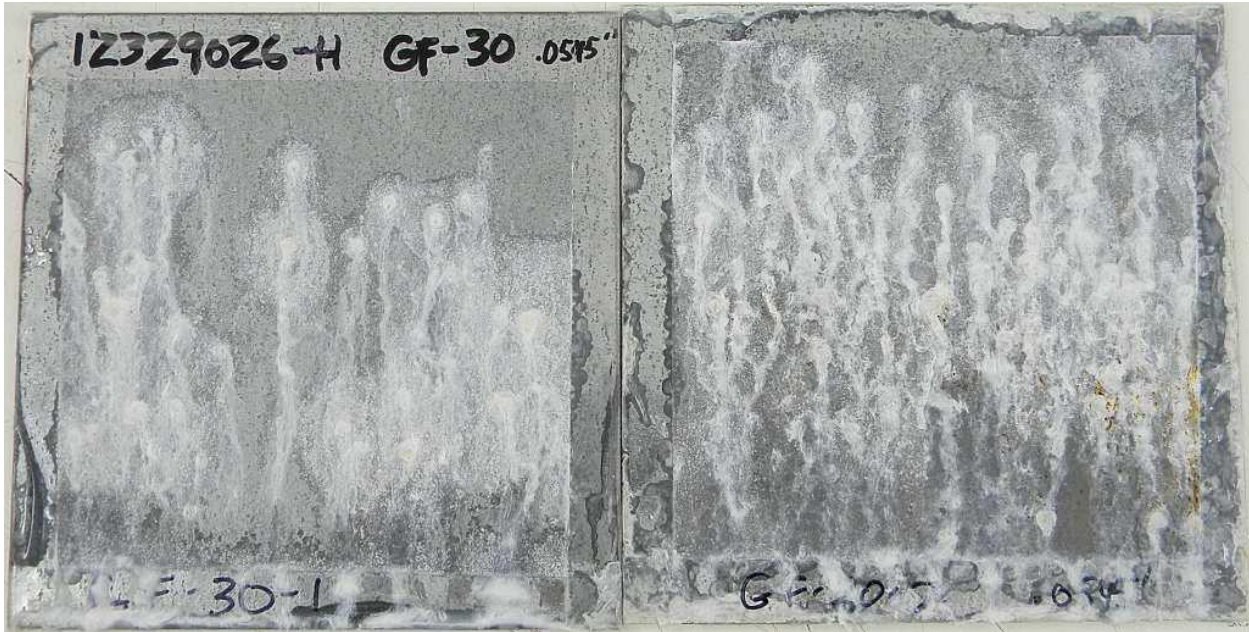
22311056 .0142" G60 - 1008 hrs Salt Spray – ASTM B117



22305013 .0139" GF45 Acrylic – 1008 hrs Salt Spray – ASTM B117



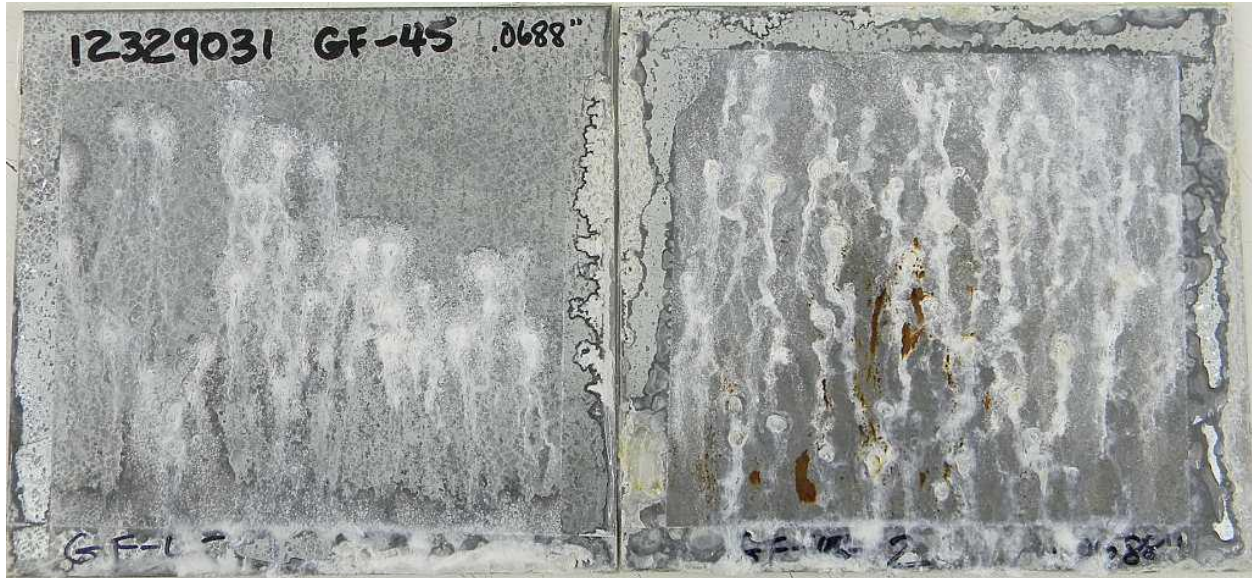
220332031 .0140" G90 Acrylic – 1008 hrs Salt Spray – ASTM B117



12329026 .0545" GF30 – 1008 hrs Salt Spray – ASTM B117



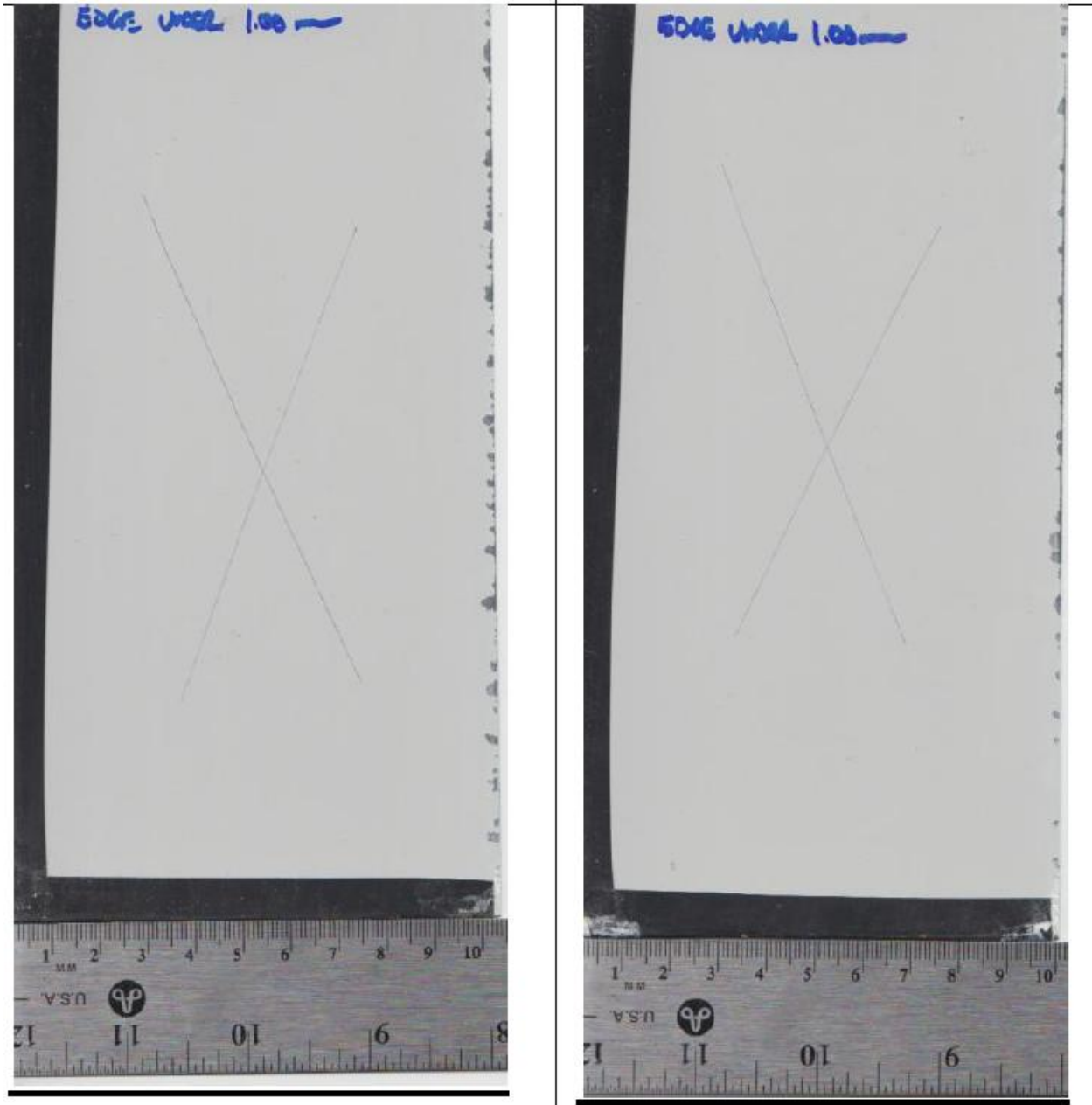
12336057 .057" G60 – 1008 hrs Salt Spray – ASTM B117



12329031 .0688" GF45 – 1008 hrs Salt Spray – ASTM B117



12338019 .071" G90 – 1008 hrs Salt Spray – ASTM B117



12163050 .0142" GF30 White Polyester Paint System – 1000 hrs Salt Spray – ASTM B117

Galfan Production Capabilities at The Techs

NexTech

Gauge:	0.008" to 0.020"
Width:	28" to 43"
Coating Weights:	GF20, GF30, GF45, GF60, GF75, GF90
Surface Treatments:	Oil, SFT (Hexavalent Chromium), RoHS, Acrylic
Temper Pass:	Available in-line on all gauges

GalvTech

Gauge:	0.014" to 0.046"
Width:	28" to 60"
Coating Weights:	GF20, GF30, GF45, GF60, GF75, GF90
Surface Treatments:	Oil, SFT (Hexavalent Chromium), RoHS
Temper Pass:	Available in-line on all gauges

MetalTech

Gauge:	0.023" to 0.110"
Width:	24" to 52"
Coating Weights:	GF30, GF45, GF60, GF75, GF90, GF115
Surface Treatments:	Oil, SFT (Hexavalent Chromium), RoHS
Temper Pass:	Not available on-line Secondary processing available all gauges up to 49.5" width