

> RAIL PRODUCTS

THE  
**NEXT**  
GENERATION  
OF **LONG**  
PRODUCTS

**SDI**  **Steel Dynamics®**  
Long Products Group

# INTENTIONALLY SUSTAINABLE

Sustainability is embedded in our founding principles—valuing our people, our partners, our communities, and our environment. We are intentionally sustainable throughout our operations and business. Our mills produce steel exclusively utilizing electric arc furnace (EAF) technology, which uses recycled ferrous scrap as the primary raw material. This method of steelmaking has a much lower environmental impact when compared to traditional steelmaking technology.



## Environmental Goals and Progress

We are taking action to reduce our environmental footprint through our 2025, 2030, and 2050 goals for greenhouse gas (GHG) emissions reduction and increased renewable electrical energy usage. With our EAF steelmaking, North American recycling business, and circular manufacturing model, Steel Dynamics is already a leader in the production of low-carbon steel products within the global industry.

## The Roadmap to Carbon Neutral



# STEEL DYNAMICS

is the preeminent source for high-quality steel long products manufactured in the U.S. We are 100% American owned and operated, and produce our long products from locally sourced recycled steel.

## STRUCTURAL AND RAIL DIVISION

Our Structural and Rail Division (SRD) became a primary source of high-quality steel products in 2002 and has since grown into Steel Dynamics' third-largest operation. Today, we are a turnkey provider of a wide range of rail products for customers in the U.S., Canada, and Mexico. At our state-of-the-art, ISO 9001:2015 and AAR M-1003 certified facility in Columbia City, Indiana, we operate two EAF furnaces, three rolling mills, and a fixed weld plant. We have the distinction of being the only North American long rail manufacturer offering hot rolled finished rails in lengths up to 320 feet. Our premium rail is used in track by Class I railroads, short lines, commuter lines, and industrial plants.

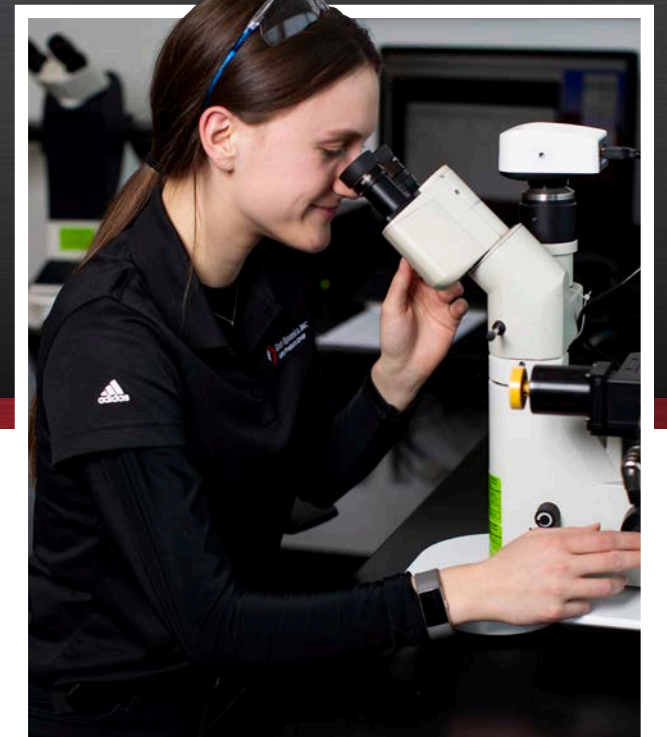
## STEEL OF WEST VIRGINIA, INC.

### SWVA, INC.

At Steel of West Virginia (SWVA, Inc.), we produce high-quality, hot rolled, carbon steel long products used in a wide variety of end markets, including construction, heavy equipment, manufacturing, and energy. We operate two EAF furnaces, a continuous caster, two rolling mills, and numerous pieces of fabrication equipment. Specialty shapes, including distinctive asymmetric shapes exclusively produced at SWVA, are custom engineered to meet your exact requirements. As an ISO 9001:2015 certified manufacturer, we continue to expand and improve our manufacturing capabilities and production efficiencies to better serve you.

### SWVA KENTUCKY, LLC

Located in Ashland, Kentucky, SWVA Kentucky produces steel flat bars and specialty alloy products including Merchant Bar Quality (MBQ) and Special Bar Quality (SBQ) products. The rolling mill consists of two roughing stands and nine finishing stands, and offers various shearing, finishing, sawing, precision straightening, and storage operations.



## RESEARCH AND DEVELOPMENT

Our state-of-the-art Research and Development (R&D) center is located at our Structural and Rail Division and serves the entire Steel Dynamics organization. Its advanced capabilities include:

- Sawing and CNC Machining
- Metallographic Grinding
- Polishing and Etching
- Optical Microscopy
- Scanning Electron Microscopy
- Hardness Testing
- Tensile Testing
- Fatigue Testing
- Rolling Contact Testing
- Fracture Toughness Testing
- Thermomechanical Simulation

## STEELMAKING

Our steelmaking operations utilize advanced technologies, including electromagnetic stirring and dynamic soft reduction, allowing for superior segregation management and overall cleanliness.

# STRUCTURAL AND RAIL DIVISION

## ROLLING AND FINISHING

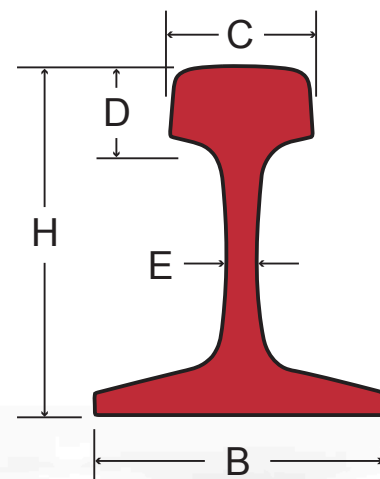
Sophisticated hot rolling technologies, including Automatic Gap Control and real-time hot side profile and surface inspection, ensure our rails have superb dimensional consistency and surface finish. Rails are rotary straightened in full, 320-foot lengths, providing superior end straightness required by our trackwork and transit customers.

## HEAD HARDENING

We achieve optimal pearlitic microstructure and hardness across all premium rail grades using our proprietary, inline, air-head hardening technology. This allows for extremely consistent surface hardness and excellent depth of hardness values across the entire length of hot rolled 320-foot rail.

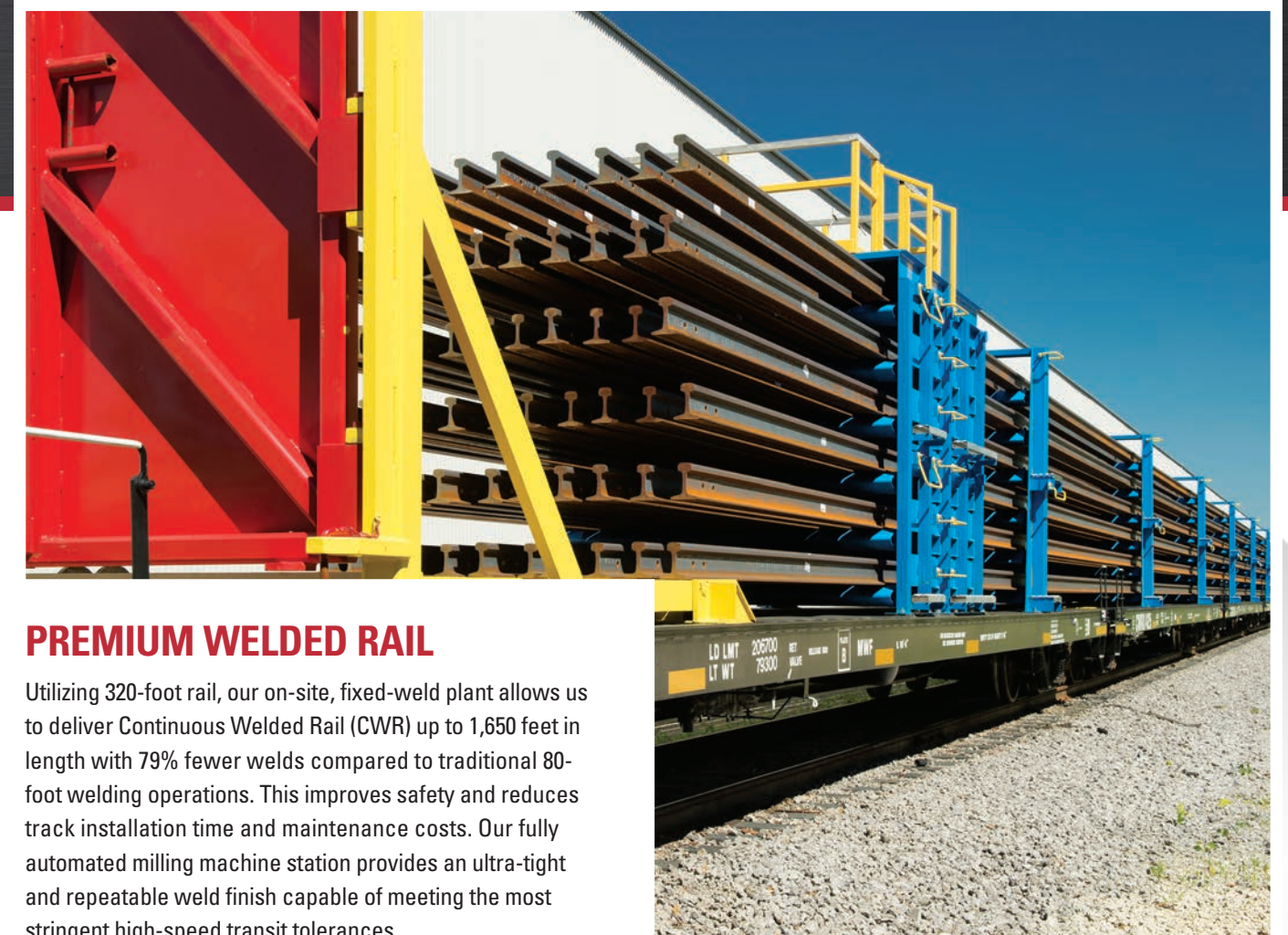
## RAIL SECTION SIZES

Section	Specifications	Nominal Dimensions					Nominal Area	Nominal Mass per Unit Length
		H	B	C	D	E		
AREMA Standard		in					in <sup>2</sup>	lbs/yd
115 RE	AREMA	6.6250	5.5000	2.7188	1.6875	0.6250	11.2171	114.3757
119 RE	AREMA	6.8125	5.5000	2.6563	1.8750	0.6250	11.6378	118.6657
132 RE	AREMA	7.1250	6.0000	3.0000	1.7500	0.6563	12.9124	131.6622
136 RE	AREMA	7.3125	6.0000	2.9375	1.9375	0.6875	13.3263	135.8826
141 RE	AREMA	7.4375	6.0000	3.1875	2.1563	0.6875	13.7972	140.7002
European Standard		mm					cm <sup>2</sup>	kg/m
60E1	EN	172	150	72	51	16.5	76.70	60.21
Legacy		in					in <sup>2</sup>	lbs/yd
100-8	ARA	5.6406	5.1406	2.6563	1.7031	0.5625	9.7527	99.4658
122 CB	CHESSIE	6.7813	6.0000	2.9375	1.9375	0.6563	12.0100	122.5000



## PRODUCT RANGE

Rail grades include Standard Strength (SS), Intermediate Strength (IS), and Head Hardened (HH). Shipment options include standard length delivery by truck or rail, and long rail delivery as Continuous Welded Rail via our fleet of CWR unit trains.



## PREMIUM WELDED RAIL

Utilizing 320-foot rail, our on-site, fixed-weld plant allows us to deliver Continuous Welded Rail (CWR) up to 1,650 feet in length with 79% fewer welds compared to traditional 80-foot welding operations. This improves safety and reduces track installation time and maintenance costs. Our fully automated milling machine station provides an ultra-tight and repeatable weld finish capable of meeting the most stringent high-speed transit tolerances.

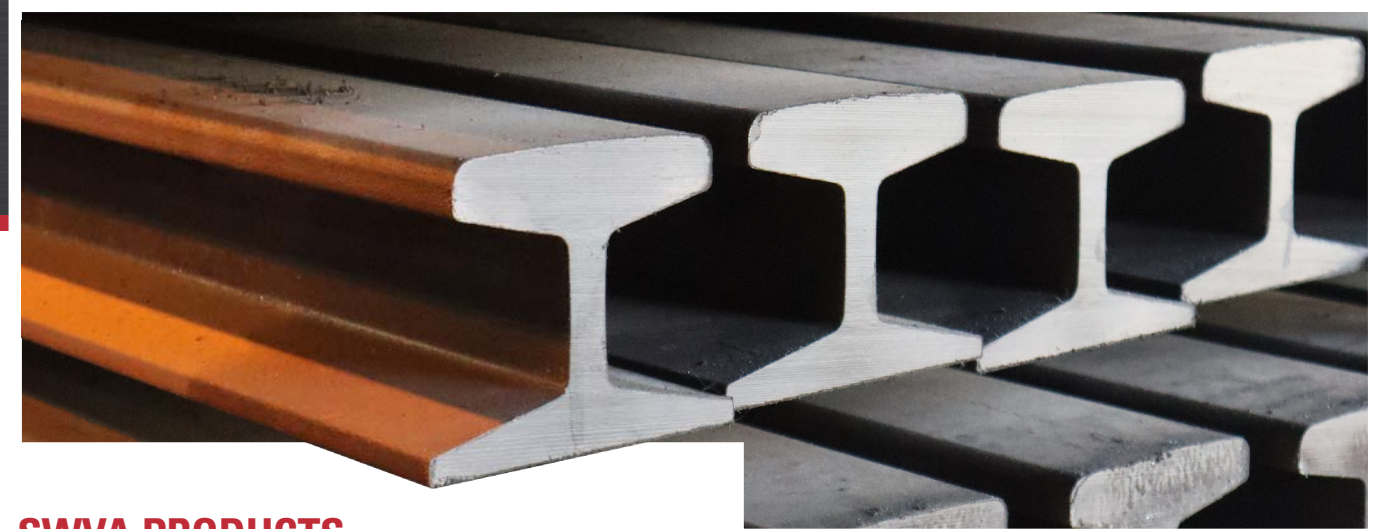
## RAIL PROPERTIES

	Standard Strength (SS)	Intermediate Strength (IS)	Head Hardened (HH)
<b>Chemical (w.t.%)</b>			
Carbon	0.74 - 0.86	0.74 - 0.86	0.74 - 0.86
Manganese	0.75 - 1.25	0.75 - 1.25	0.75 - 1.25
Phosphorous	0.020 max	0.020 max	0.020 max
Sulfur	0.020 max	0.020 max	0.020 max
Silicon	0.10 - 0.60	0.10 - 0.60	0.10 - 0.60
Nickel	0.25 max	0.25 max	0.25 max
Chromium	0.30 max	0.30 max	0.30 max
Molybdenum	0.060 max	0.060 max	0.060 max
Vanadium	0.010 max	0.010 max	0.010 max
Aluminum	0.010 max	0.010 max	0.010 max
<b>Mechanical (Typical)</b>			
Yield Strength (ksi)	100	125	140
Ultimate Tensile Strength (ksi)	155	175	190
Elongation (%)	12.5	12	11.5
Surface Hardness (HB)	330	365	390
Fracture Toughness KIC (MPa-vn)	33	33	34

# STEEL OF WEST VIRGINIA

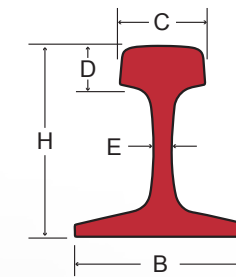
## ROLLING AND FINISHING

At both SWVA, Inc. and SWVA Kentucky, LLC's rolling mills, rail products are hot rolled and rotary straightened. Cut-to-length, drilling, punching, and storage services are offered for all of our rail products. Specialty shapes, including distinctive rail sections solely produced by SWVA, Inc., are custom engineered to meet customer requirements.



## SWVA PRODUCTS

Crane and Mine Rail							
Product	Specifications	H	B	C	D	E	Nominal Area in. <sup>2</sup>
		in.					
30 lb.	ASCE	3.125	3.125	1.687	0.875	0.328	2.993
40 lb.	ASCE	3.500	3.500	1.875	1.015	0.391	3.940
60 lb.	ASCE	4.250	4.250	2.375	1.218	0.484	5.939
85 lb.	ASCE	5.188	5.188	2.563	1.547	0.563	8.332
High-Speed Transit Rail							
84C Special Shape Rail	ASCE	4.875	4.063	4.125	1.281	0.563	8.440



## VALUE-ADDED SERVICES

Steel of West Virginia offers a range of value-added services to provide customers with greater efficiency and convenience.

- > Cut-to-Length
- > Hole Punching
- > High-Precision CNC Plasma Cutting
- > Straightening
- > Stenciling and Branding
- > Storage

## RAIL SECTION

We produce light rail used as a supply line in the mining industry and as crane rail in other applications. It is standard A.S.C.E. 30-, 40-, 60-, and 85-pounds-per-yard rail. We also produce light rail designed as third rail for high-speed rail transit, such as the 84C.

## TRACKWORK

Steel of West Virginia, Inc. and SWVA Kentucky, LLC produce a variety of shapes and sizes used in common trackwork applications. These sizes include, but are not limited to, reinforcement bars, joint/splice bars, base plate, and U69 guard bars.

## PRODUCT RANGE

We provide a range of high-quality, hot rolled carbon steel long products used in a wide variety of end markets. Properties include crane rail and mine rail. Shipment options include truck, rail, and barge.

Trackwork Products	
Section	Product Size
SWVA, Inc. Products	
U69 Guard Bar	22.18 lbs./ft.
SWVA Kentucky, LLC	
Base Plate	3/4" x 4" Flat Bar
Base Plate	3/4" X 8" Flat Bar
Base Plate	1" X 8" Flat Bar
D-Bar	1-1/4" x 132 RE
D-Bar	1-1/4" x 115 RE
D-Bar	1/2" x 132 RE
D-Bar	1/2" x 115 RE

Additional Flat Bar sizes used for Base Plates available upon request.

Joint/Splice Bar	
Section	Weight Lbs./ Ft.
80 lb. ASCE	10.18
90 lb. ARA-A	11.97
100 lb. RB / 100-B	11.56
100 lb. ARA-A	14.71
100 RE	14.83
112 RE	19.30
132 RE	19.80

Additional Joint/Splice Bar sizes available upon request.

# OUR COMMITMENT

By harnessing the American spirit of hard work and safe, innovative manufacturing, our rail team works to provide customers with the lowest total cost of ownership.



For more information, visit us at [lpg.steeldynamics.com](http://lpg.steeldynamics.com).

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