

> Railroad Ballast from TMS International Slag

FIELD-PROVEN BY THE NATION'S LEADING RAILROADS

Steel slag ballast has characteristics desirable in mainline ballast, field-proven over the past several years by many of the nation's leading railroads.

Ballast Characteristics:

- Heavyweight—providing high resistance to lateral thrust on curves and protection against washout in areas subject to flooding
- High percentage of void space—providing consistently good drainage
- High resistance to abrasion—minimizing degradation and loss of elasticity in the section itself
- Natural cubicity and extreme angularity—combined with fractured faces, assure total interlock and result in very high stability under all track conditions
- High resistance to chemical attack—freeze-thaw, wet-dry degradation influences



PHYSICAL PROPERTIES

Property	Steel Slag	AREA Specifications	ASTM Method
Weight Per Cubic Foot	105 lb. (avg.)	100 lb. min.	ASTM C-29
Clay Lumps	None	0.5% max.	ASTM C-142
Soft and Friable Pieces	Negligible	5.0% max.	ASTM C-142
Material Finer Than 200 Sieve	Less than .05%	1.0% max.	ASTM C-117
Los Angeles Abrasion Loss	Less than 30%	40% max.	ASTM C535-96
Sodium Sulfate Soundness Loss	Less than 5%	10% max. (5 cycles)	ASTM C88

Processed steel furnace slag also meets all other AREA specifications and AAR recommendations as indicated in this tabulation.

TMS INTERNATIONAL STEEL SLAG IS A STABLE, SUSTAINABLE PRODUCT OF THE STEEL MAKING PROCESS, ENGINEERED FOR USE BY TMS INTERNATIONAL

Based on its physical properties, and through extensive testing and actual field use throughout the United States, TMS International Steel Slag can outperform natural aggregates in a variety of special applications.

TMS International Steel Slag is processed at local steel mills and is structurally stable. When fully cured, TMS Steel Slag represents a practical resource that is both economically attractive and environmentally sound, well below US EPA Toxicity Characteristics Leachate Procedure (TCLP) limits by a wide margin.

TMS International Steel Slag is available to suit individual size and specification requirements.

For more information on TMS Steel Slag, contact our Aggregate Sales Department at **1-855-TMS-SLAG** (1-855-867-7524) or visit our website at tmsinternational.com/slag-aggregates.cfm.

Typical TCLP Analysis (mg/l)		
	TMS STEEL SLAG	EPA Max.
Arsenic	0.002	5.0
Barium	1.400	100.0
Cadmium	0.002	1.0
Chromium	0.038	5.0
Lead	0.004	5.0
Mercury	0.0002	0.2
Selenium	0.003	1.0
Silver	0.005	5.0

Physical Properties		
LA abrasion	(ASTM C 535-96)	18-25% loss
Sodium sulfate	(ASTM C 88)	4-10% loss
Density	(ASTM C 29)	100-140 lbs./ft ³
Absorption	(ASTM 128-97)	2-4%
Compaction	(ASTM D 1557C)	130-156 lbs./ft ³ @ Optimum Moisture

Major Primary Mineral Constituents (Molecular and Structural Formula)		
Wustite	iron oxide	[FeO]
Spinel Group	magnesium aluminum oxide	[MgAl ₂ O ₄]
Magnetite	iron oxide	[Fe ₃ O ₄]
Gehlenite	calcium aluminum silicate	[Ca ₂ Al(AlSiO ₇)]
Merwinite	calcium magnesium silicate	[Ca ₃ Mg(SiO ₄) ₂]
Larnite/Belite/C ₂ S	calcium silicate	[Ca ₂ SiO ₄]
Calcio-Olivine	calcium silicate	[Ca ₂ SiO ₄]
Srebrodolskite	calcium iron oxide	[Ca ₂ Fe ₂ O ₅]
Bredigite	calcium magnesium silicate	[Ca ₁₄ Mg ₂ Si ₈ O ₃₂]
Amorphous		

For more information please contact:

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