

CHAPARRAL

**CHAPARRAL (VIRGINIA), INC.
25801 HOFHEIMER WAY
PETERSBURG, VIRGINIA, 23803
(804) 520 - 0286
FAX: (804) 524 - 2842**

FERROUS RAW MATERIALS MANUAL

PART 3

FERROUS RAW MATERIALS SPECIFICATIONS

Revision 14.0
Effective June 6, 2008

PART 3 SPECIFICATIONS OF...

CHAPARRAL (VIRGINIA) INC., AND ITS AFFILIATED COMPANIES (HEREINAFTER REFERRED TO AS “CHAPARRAL” OR “BUYER”):

Table of Contents

Introduction.....	3
General Specifications for Prepared Ferrous Raw Material Supplied for Direct Furnace Charging.....	4
Appendix 1: How Do I Check The Bulk Density Of My Shipment ?.....	10
Appendix 2: Photographs	
Clutch Plates.....	11
High Copper “Powder Metallurgy” Motor Vehicle Engine/Transmission Parts.....	12
 Prepared Raw Material	
No. 1 Prepared Grades	
No.1 Heavy Melt.....	13
Plate & Structural.....	14
No. 1 Industrial.....	15
Plate Scrap.....	16
 No. 2 Prepared Grades	
No. 1 and 2 Heavy Melt Mixed (“Mixed Heavy Melt”).....	17
Foundry Steel.....	18
No. 2 Heavy Melt.....	19
 Shredded Grades	
Shredded Steel.....	20
 Low Residual Grades	
2 Ft. Busheling.....	21
Mixed Busheling.....	22
 Virgin Iron Units and Miscellaneous	
Pig Iron.....	23
Processed Iron.....	24
 Chaparral Specification Summary Sheets	
Prepared Grades.....	25

GENERAL SPECIFICATIONS

INTRODUCTION

CHAPARRAL (VIRGINIA) INC., AND ITS AFFILIATED COMPANIES (HEREINAFTER REFERRED TO AS “CHAPARRAL” OR “BUYER”) ...

Purchases scrap materials solely for shredding, remelting and other recycling purposes.

Scrap purchased for shredding, remelting and other recycling purposes may be referred to herein as “Ferrous Raw Materials”.

Without Chaparral's prior written approval, all purchased Ferrous Raw Materials must meet Chaparral Specifications.

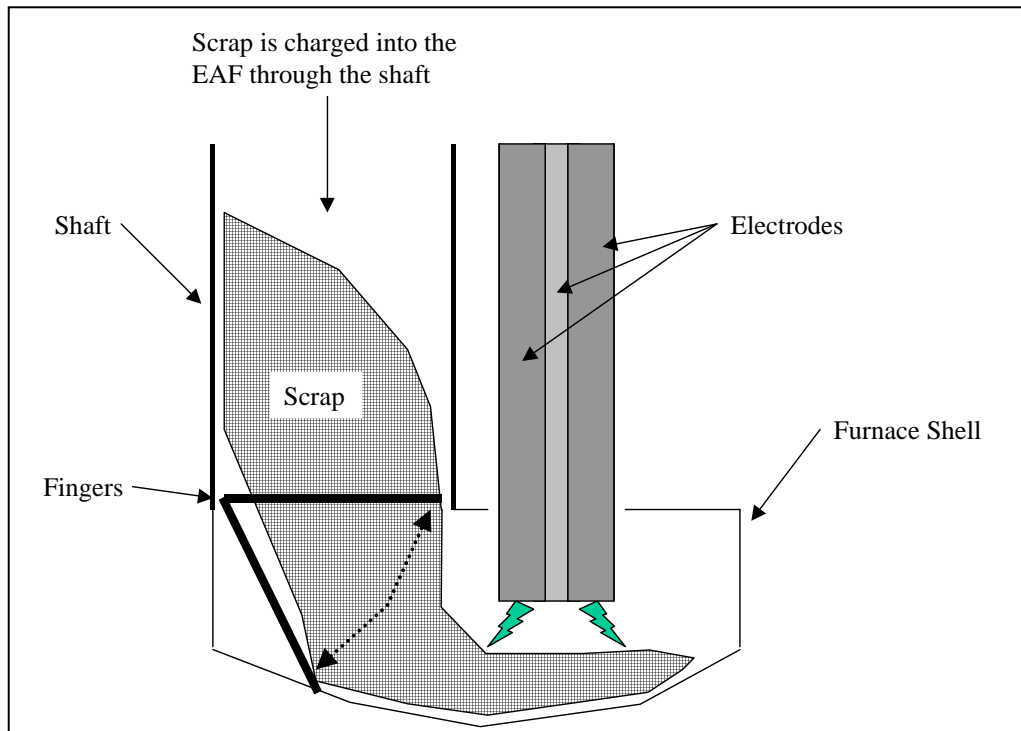
Chaparral expects every Supplier to provide materials that consistently meet our Specifications and that conform with Chaparral Safety & Environmental Quality Requirements (Part 2 of Ferrous Raw Materials Manual (“FRMM”)).

It is our goal that imposition of a downgrade, monetary penalty, or rejection for failure to meet specifications or other requirements shall be a rare occurrence. Suppliers who do not consistently meet our specifications and other requirements will be disqualified See Item 10 of the Commercial Terms & Conditions of Purchase (Part 1 of FRMM).

GENERAL SPECIFICATIONS FOR PREPARED FERROUS RAW MATERIAL SUPPLIED FOR DIRECT FURNACE CHARGING

1) PRINCIPAL CHARACTERISTICS DESIRED

- a) Chaparral Virginia employs “Finger Shaft Electric Arc Furnace (EAF)” melting technology. This technology impacts scrap requirements. In general, the following requirements must be met:
 - i) Ferrous scrap must be prepared so that it lies flat,
 - ii) The weight and dimensions of Individual pieces must not exceed the values given in the grade-by-grade specifications,
 - iii) Individual pieces of scrap must not exceed 1 inch in thickness
 - iv) Shipments must not contain badly tangled material, or material that would tend to become badly tangled, in amounts that would appreciably increase material handling or furnace charging times (by comparison to average shipments of the same grade)
- b) Bulk Density: Is an important dimension of scrap quality. Shippers are encouraged to determine the bulk density of each shipment, and to rework shipments that fail to meet requirements before forwarding to Chaparral. See Part 3, Appendix 1 “How Do I Check The Bulk Density Of My Shipment ?”
- c) Vendors of ferrous scrap should review the following description of “Finger Shaft EAF” operations so that they better understand these scrap requirements. The following figure shows a cross-sectional schematic of the Virginia of “Finger Shaft EAF”:



- d) Scrap is charged through the shaft. The shaft is equipped with fingers so that scrap may be held in the shaft. The scrap either falls onto the fingers (if the fingers are closed) or into the furnace (if the fingers are open.) The scrap slides toward the electrodes as the electric arc melts the scrap. It is imperative that scrap be prepared so that it lies flat and has little or no 3-dimensional characteristics. Many traditionally acceptable "No. 1 Heavy Melt" items, such as gear boxes and large machine parts, do not slide out of the shaft. Instead, they act like "bowling balls" and exit the shaft with tremendous momentum, which makes such items unacceptable. In a "Finger Shaft EAF", heavy, "three-dimensional" scrap will break electrodes.
- e) The shaft and fingers are water-cooled. Maximum piece weight and sizing must be observed in order to preclude damage to water-cooled shaft components caused by the impact of large, heavy pieces.
- f) Pieces thicker than 1 inch threaten furnace operations in yet another way. Pieces over 1-inch thick may not melt completely before the liquid steel is tapped. During the tapping operation, unmelted scrap can clog the taphole.
- g) Piece size and bulk density are of extreme importance to EAF operations. Please refer to the grade-by-grade specification for size requirements.
- h) In summary, the following ferrous scrap guidelines are of extreme importance to the safe and efficient operation of the finger shaft EAF:
 - i) Scrap must be prepared so that it has very little or no "3-dimensional" characteristics,
 - ii) Scrap must be prepared so that it "slides" out of the shaft,
 - iii) Individual pieces must not exceed maximum piece weight for a particular grade,
 - iv) Piece thickness must not exceed 1 inch
 - v) Individual pieces must be sized according to the particular grade of scrap.

2) Chemistry, including residual elements:

- a) Scrap must be free of all but negligible amounts of high alloy steels, including stainless steels, tool and die steels, manganese steel, and high-temperature alloys. In addition, unless otherwise indicated by the Chaparral Specification for a given scrap grade, or by mutual agreement between Chaparral and the Seller, the average chemical analysis for any scrap shipment must not exceed the levels shown below:

Element	Max. %
C	1.00%
S	0.05%
P	0.05%
Mn	1.65%
Si	0.60%
Cu	0.35%
Ni	0.15%
Cr	0.25%
Cu + Ni + Cr	0.70%
Mo	0.05%
Al	0.05%
Zn	0.05%
Sn	0.02%
Cd	0.02%
Pb	0.01%
Sb	0.01%

NOTE: 0.01% Max =
Not more than one pound in
ten thousand pounds.

3) DANGEROUS, DAMAGING OR VERY COSTLY “CONSEQUENCE OF USE”:

If one of the events listed below is traced to a particular shipment, then, in addition possible immediate disqualification of the shipper and / or Vendor, a non-negotiable monetary penalty may be imposed pursuant to Section 10 of the Commercial Terms & Conditions of Purchase (Part 1 of the FRMM) to recover costs, including but not limited to, cleanup, administrative, legal, and enforcement costs which result from requirements that may be imposed under law by any government agency. The penalty shall be in addition to any other rights and remedies which Chaparral may have under the terms of the FRMM Parts 1-3, by agreement, or at law.

- Melting of a radioactive source contained in the shipment
- Release of toxic substance(s) or hazardous waste(s) contained in the shipment
- Explosions and / or other damage caused on Chaparral plant property
- “Missed Chemistry” event that resulted in the scrapping or major loss in value of a heat of steel.

- 4) PROHIBITED ITEMS AND SUBSTANCES THAT ARE “ZERO TOLERANCE” AT ALL TIMES. “ZERO TOLERANCE” MEANS: DISCOVERY OF THE LISTED ITEMS OR SUBSTANCES IN SHIPMENTS MAY RESULT IN THE IMMEDIATE DISQUALIFICATION OF THE SHIPPER AND / OR VENDOR.
- a) Radioactive sources
 - b) PCB capacitors
 - c) Other “PCB Items”
 - d) Asbestos
 - e) Any other toxic substances and / or hazardous wastes
 - f) Explosive or highly flammable substances. Includes engine and transmission oil, gasoline, diesel fuel, propane and other fuels.
 - g) Scrapped items that contain CFC, HCFC & other refrigerants
 - h) Closed Container(s). “Closed containers” means anything designed to hold liquid or gas under pressure that has not been obviously cut wide open, and therefore presents risk of explosion. Small holes are not enough. “Closed containers” include, but are not limited to, hydraulic cylinders, fire extinguishers, fuel storage tanks, oxygen or propane tanks, etc.
- 5) PROHIBITED ITEMS AND SUBSTANCES WHOSE REPEATED DISCOVERY IN SHIPMENTS MAY RESULT IN THE DISQUALIFICATION OF THE SHIPPER AND / OR VENDOR.
- a) Mercury, including mercury-containing capsules from motor vehicle convenience light switches.
 - b) Undrained used oil filters and free organic liquids.
 - c) Chlorinated plastics.
 - d) Scrap contaminated with NORM (Naturally Occurring Radioactive Material)
 - e) “Brick-sized” or larger pieces that don’t conduct electricity, and that present risk of electrode breakage during electric arc furnace re-melting. Examples: rubber tires, pipes filled with cement, wood, railroad car scrap with wood attached, etc.
 - f) Metallic lead and lead oxide, including lead-acid batteries, battery cables, and wheel weights.
 - g) Scrapped items that contained CFC, HCFC & other refrigerants
 - h) Batteries of any kind
 - i) Automotive “Air Bag” propellant canisters
 - j) Coils of any kind (wire, banding, cable, sheet, strip, etc.)
- 6) ITEMS THAT MAY BE TOLERATED IN NEGLIGIBLE AMOUNTS, BUT IF DISCOVERED REPEATEDLY IN SHIPMENTS IN EXCESSIVE AMOUNTS MAY RESULT IN THE DISQUALIFICATION OF THE SHIPPER AND / OR VENDOR.

Unless otherwise indicated, “Negligible” shall mean any amount less than, and “Excessive” shall mean amounts greater than...

0.05% by weight: 20 Lb. in 40,000 Lb., or 70 Lb. in 140,000 Lb.

- a) Metallic Copper (Cu) and Aluminum (Al). Includes Copper-wound and Aluminum-wound motors larger than 10 inches in diameter; Copper, Brass, or Aluminum wire, insulated wire, tubing, and other Copper, Brass, or Aluminum items mixed with, attached to, or coating ferrous scrap

- b) Flashlight batteries and the like.
- c) Other non-ferrous metals and non-ferrous metal oxides, including slags, drosses and related residues.
- d) Due to high Copper content, loose motor vehicle brake shoes and clutch plates, unless the pads have been completely removed. (see Part 3, Appendix 2, page 13 for clutch plate photos)
- e) Engine, transmission, and other parts produced by the "Powder Metallurgy" process. (Copper is frequently used to bind the steel powder in the manufacturing process and the Copper content of such parts can be 2% or more.)

- i) How would you know whether scrapped parts have been manufactured using the "Powder Metallurgy" process? The answer is: unless you chemically analyze the steel, most of the time you won't know ! See Part 3, Appendix 2, page 14, for photographs of parts that we have confirmed contain at least 2% Copper.
- ii) Chaparral can recycle such parts, but in very limited quantity in any one shipment. We can safely recycle shipments that contain about 2% by weight of such parts. 2% by weight means about:

900 pounds in a 45,000-pound shipment

2,800 pounds in a 140,000-pound shipment

- iii) The problem of high Copper "Powder Metallurgy" parts will be of greatest concern primarily to scrap Suppliers who collect or buy scrap that originates from engine and/or transmission rebuilding businesses. Sellers to Chaparral will have to take care to assure that scrap originating from engine and/or transmission rebuilding businesses does not get concentrated in any one shipment, but rather "spread out" over many shipments in order to keep overall Copper contents acceptably low.
- f) Tin-coated (Sn-coated) scrap.
- g) Loose (i.e., detached) motor vehicle shock absorbers.
- h) Iron oxide in any form except for nominal amounts of surface rust arising from outside storage of prepared scrap under normal atmospheric conditions for a period usually not exceeding six months. Heavily rusted shipments will be rejected.
- i) Waste or industrial byproducts containing iron in a form not economically recoverable via Electric Arc Furnace Steelmaking. Includes, but may not be limited to the following: waste or byproducts arising from steel melting, heating, surface conditioning (includes scarfing,) grinding, sawing, welding and torch cutting operations, including: slag, mill scale, baghouse dust, grinder dust, sludge, welding flashings, and kerf.
- j) Detached Used Oil Filters.
- k) Cast iron (including ductile iron) with a Phosphorous (P) content over 0.15%. Examples: railroad brake shoes, soil pipe, cast iron radiators. Shipments of No.2 Heavy Melt or Mixed Heavy Melt scrap may contain not more than 2.5% (two and one half percent) by weight of "low Phosphorous" (i.e. less than 0.15% phosphorous) cast iron, e.g. clean auto cast.
- l) Oil, grease, and other liquid or solid combustible and/or non-combustible non-metallic substances including tar, rubber, plastic, glass, concrete, paper, etc. attached to or adhering to scrap. Example: scrapped hand tools (screw drivers, hammers, etc.) with plastic handles.
- m) Wire from motor vehicle tire shredding operations.
- n) Municipal scrap.

- 7) ITEMS ALLOWED TO BE COMINGLED WITH OTHER PREPARED SCRAP ITEMS IF PROPERLY PREPARED
 - a) Used Steel Containers, but only in the scrap grades in which Used Steel Containers are permitted.
- 8) Suppliers must not deviate from Chaparral's Specifications without prior approval.

APPENDIX 1 How Do I Check The Bulk Density Of My Shipment ?

1. **Calculate the volume of the trailer, railcar, or shipping container.**

Measure the inside length, width, and height of the container in feet. Multiply these three numbers together to get the volume of the container in cubic feet.

Example: Length: 20 feet
 Width: 8 feet
 Height: 8 feet
 Volume: $20 \times 8 \times 8 = 1,280$ cubic feet

2. **Determine the net weight of the shipment.**

Subtract the tare weight of the vehicle from the gross weight of the vehicle.

Example: Gross weight: 78,000 lbs
 Tare weight: 40,000 lbs
 Net weight: 38,000 lbs

3. **Ask yourself... “How full is the trailer (or railcar or container) ?”**

How full is the trailer if “0%” is empty, and “100%” is completely full ? Is the trailer at least 50% full ? Is it 90% full?

Example: Your trailer appears to be more than half-full, but not quite three-quarters full. You answer the question, “The trailer is 70% full.”

4. **Use the results from 1, 2, and 3 to calculate the bulk density.**

Multiply the volume obtained in step 1 by the answer from step 3. You now have the volume that the scrap actually occupies.

Example: Volume of trailer: 1280 cubic feet
 % full: 70% full
 Volume of scrap: $1280 \times 0.7 = 896$ cubic feet

Divide the net weight of the shipment by the answer above to obtain the bulk density of the shipment.

Example: Net weight: 38,000 lbs
 Volume of scrap: 896 cubic feet
 Bulk density: $38,000 / 896 = 42.4$ lbs / cubic foot

The bulk density of the scrap is 42 lbs / cubic foot. Compare this result to the value in the scrap specification to minimize the chance of a downgrade due to poor bulk density.

Note:

- If the grade in the trailer were P&S, for which we require a minimum bulk density of 44 lbs / cubic foot, this shipment would be downgraded at least to No. 1 Heavy Melt upon arriving at our plant site.
- If the grade in the trailer were No. 2 Heavy Melt, for which we require a minimum bulk density of 38 lbs / cubic foot, the shipment would be accepted as shipped, provided that no additional quality issues were discovered.

APPENDIX 2



Clutch Plate With Copper- or Brass-Impregnated Non-Metallic Pads



Clutch Plate With Copper Metal Pads

APPENDIX 2 (Cont.)



High-Copper "Powder Metallurgy" Motor Vehicle Engine/Transmission Parts

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	No. 1 Heavy Melt	
Grade Code	601A	
Dimensions	Thickness	1/4" and over (Exception: May include Busheling, Clips, Railroad Heavy Melt, and P&S)
	Maximum Length X Width	Other than included Busheling, Clips, Railroad Heavy Melt, and P&S. 3' X 18", or 2' X 24"
		Included Busheling, Clips, Railroad Heavy Melt, and P&S must meet appropriate specification for grade.
Mass	Maximum Weight per Piece	90% of pieces under 200 lbs. 300 lbs MAXIMUM
Bulk Density (lbs/cu ft)	Aim	50+
	Downgrade:	
	• No.1 Heavy Melt to Mixed Heavy Melt, if under...	47
	• Mixed Heavy Melt to No.2 Heavy if under...	38
	• Reject if under...	32
Description	Clean steel scrap not excessively rusted or corroded.	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12	
Grade-Specific Additional Requirements	Free of all but negligible amounts of...	
	<ul style="list-style-type: none"> • Rebar • Pipe and tubing over 3 Ft. • Manganese Steel and other non-magnetic metallic items • Cast Iron • Rail car brake shoes & pads • Automotive scrap other than crankshafts, wheels, and clean chassis scrap 	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	
Combustible Non-Metallic Content	Aim for maximum of:	0.025% by weight: 10 lbs in 40,000 lbs, or 35 lbs in 140,000 lbs.

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Plate & Structural	
Grade Code	601C	
Dimensions	Thickness	1/8" MINIMUM 1" MAXIMUM (Exception: May include Busheling or Clips.)
	Maximum Length X Width	Other than included Busheling or Clips: 3' X 12" X 12" Included Busheling or Clips must meet appropriate specification for grade.
Mass	Maximum Weight per Piece	90% of pieces under 200 lbs 300 lbs MAXIMUM
Bulk Density (lbs/cu ft)	Aim	50+
	Downgrade: to Mixed Heavy Melt, if under...	44 (To Mixed Heavy Melt)
	Reject if under...	32
Description	Clean plate and / or structural steel scrap not excessively rusted or corroded.	
	May include rail car truck and structural scrap, but no rail car sides or tops.	
	May include Welded Structural Steel Tubing in 3 ft. max lengths.	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12.	
Grade-Specific Additional Requirements	Free of combustible non-metallic materials.	
	Free of all but negligible amounts of... <ul style="list-style-type: none"> ● Steel bars including rebar; cable; and wire & wire rods, whether in bar or coil form ● Pipe and tubing other than Welded Structural Steel Tubing ● Manganese Steel and other non-magnetic metallic items ● Cast Iron & Steel Castings ● Rail car brake shoes & pads Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	No. 1 Industrial	
Grade Code	601D	
Dimensions	Thickness	1/8" MINIMUM 1" MAXIMUM (Exception: May include Busheling or Clips.)
	Maximum Length X Width	Other than included Busheling or Clips: 3' X 24"
		Included Busheling or Clips must meet appropriate specification for grade.
Mass	Maximum Weight per Piece	90% of pieces under 200 lbs. 300 lbs MAXIMUM
Bulk Density (lbs/cu ft)	Aim	60+
	Downgrade: to Mixed Heavy Melt, if under...	44
	Reject if under...	32
Description	Very clean, "high yield" scrap including forging scrap.	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12	
Grade-Specific Additional Requirements	Without Chaparral's prior approval, no automobile steel.	
	Free of combustible non-metallic materials.	
	Free of all but negligible amounts of...	
	<ul style="list-style-type: none"> ● Manganese Steel and other non-magnetic metallic items ● Rail car brake shoes and pads ● Cast iron ● Steel bars under 3/4 " in diameter; rebar; cable; and wire & wire rods, whether in bar or coil form. 	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Plate Scrap	
Grade Code	601P	
Dimensions	Thickness	1/8" MINIMUM 1" MAXIMUM (Exception: May include Busheling or Clips.)
	Maximum Length X Width	Other than included Busheling or Clips: 3' X 24" Included Busheling or Clips must meet appropriate specification for grade.
	Mass	
	Maximum Weight per Piece	90% of pieces less than 200 lbs 300 lbs MAX
Bulk Density (lbs/cu ft)	Aim	55+
	Downgrade: Plate to P&S, if under...	50
	Plate to Mixed Heavy Melt, if under...	44
	Reject if under...	32
Description	Clean plate steel scrap not excessively rusted or corroded. May contain structural steel only if prepared into plate pieces.	
General Requirements	All material supplied must meet Chaparral Steel's "General Specifications for Prepared Ferrous Scrap Supplied for Direct Furnace Charging." See SPECIFICATIONS, pages 7-12.	
Grade-Specific Additional Requirements	Shipments consisting of any amount of structural steel not prepared as plate will be automatically downgraded to P&S.	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Mixed Heavy Melt (No. 1 and 2 Heavy Melt Mixed)	
Grade Code	602B	
Dimensions	Thickness	1" MAXIMUM
	Maximum Length X Width	3' X 18" or 2' X 24"
Mass	Maximum Weight per Piece	90% of pieces under 200 lbs 300 lbs MAXIMUM
Bulk Density (lbs/cu ft)	Aim	47+
	Downgrade: Mixed Heavy Melt to No. 2 Heavy if under...	38
	Reject if under...	32
Description	<p>Clean steel scrap, including all automobile scrap free of wiring and non-metallic auto components, i.e., fabric, rubber, plastic, glass, etc.</p> <p>This grade encompasses a mixture of No. 1 Heavy Melt and No. 2 Heavy Melt. Each component of the load (i.e. No. 1 Heavy or No. 2 Heavy) must meet the specifications for the particular grade.</p> <p>May contain up to 20 percent Rebar if...</p> <ul style="list-style-type: none"> • Rebar pieces are less than two Ft. in length • the Rebar is distributed throughout the shipment • Efficient handling of the shipment is not compromised by matted / tangled Rebar 	
General Requirements	<p>All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12.</p> <p>Low "three-dimensional" characteristics. Scrap must be prepared so that it lies flat.</p>	
Grade-Specific Additional Requirements	<p>Not more than 2.5% by weight of cast iron.</p> <p>Not more than 10% of automotive engine, transmission, and other parts produced by the "Powder Metallurgy" process, due to high Copper content.</p> <p>Free of...</p> <ul style="list-style-type: none"> • Sheared auto slabs • Whole engine blocks (dirty motors) • White goods (household appliances) <p>Free of all but negligible amounts of...</p> <ul style="list-style-type: none"> • Manganese Steel and other non-magnetic metallic items • Rail car brake shoes & pads • Loose (i.e. detached) motor vehicle shock absorbers <p>Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.</p>	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Foundry Steel	
Grade Code	602Y	
Dimensions	Thickness	¼" MIN 1" MAX
	Maximum Length X Width	2' X 24"
Mass	Maximum Weight per Piece	90% less than 200 lbs 300 lbs MAX
Bulk Density (lbs/cu ft)	Aim	50+
	Downgrade: Foundry Steel to Mixed Heavy Melt, if under...	44
	Reject if under...	32
Description	This grade is "Mixed Heavy Melt" (Grade Code 602B) prepared to 2 Ft. Max piece length and width, and having higher minimum bulk density requirements.	
General Requirements	All material supplied must meet Chaparral Steel's "General Specifications for Prepared Ferrous Scrap Supplied for Direct Furnace Charging." See SPECIFICATIONS, pages 7-12.	
Grade-Specific Additional Requirements	See "Mixed Heavy Melt" (Grade Code 602B)	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	No. 2 Heavy Melt	
Grade Code	602A	
Dimensions	Thickness	Usually 1/8" and over
	Maximum Length X Width	Other than included No. 1 Heavy Melt: 3' X 18", or 2' X 24"
Mass	Maximum Weight per Piece	90% of pieces under 200 lbs 300 lbs MAXIMUM
Bulk Density (lbs/cu ft)	Aim	37
	Reject if under...	32
Description	<p>Clean steel scrap, including all automobile scrap free of wiring and non-metallic auto components, i.e., fabric, rubber, plastic, glass, etc.</p> <p>May contain up to 20 percent Rebar if...</p> <ul style="list-style-type: none"> • Rebar pieces are less than two Ft. in length • the Rebar is distributed throughout the shipment • Efficient handling of the shipment is not compromised by matted / tangled Rebar 	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 6-8.	
Grade-Specific Additional Requirements	Not more than 2.5% by weight of cast iron.	
	<p>Not more than 10% of automotive engine, transmission, and other parts produced by the "Powder Metallurgy" process, due to high Copper content.</p> <p>Free of...</p> <ul style="list-style-type: none"> • Sheared auto slabs • Whole engine blocks (dirty motors) • White goods (household appliances) • Loose (i.e. detached) motor vehicle shock absorbers 	
	<p>Free of all but negligible amounts of...</p> <ul style="list-style-type: none"> • Manganese Steel and other non-magnetic metallic items • Rail car brake shoes & pads 	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	
Combustible Non-metallic Content	Aim for maximum of:	0.05% by weight: 20 lbs in 40,000, or 70 lbs in 140,000

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Shredded Steel	
Grade Code	606A	
Dimensions	Maximum Length X Width	90% under 8" Balance 24" MAXIMUM
Bulk Density (lbs/cu ft)	Aim	60+
	Downgrade:	
	Shredded to Mixed Heavy Melt, if under...	50
	Shredded to No. 2 Heavy, if under...	40
Special Chemistry Requirements	Element	Maximum %
	Carbon (C)	1.00 %
	Copper (Cu)	0.30 %
	Tin (Sn)	0.02 %
Description	Clean, dense, magnetically-separated, shredder-processed scrap essentially free of non-ferrous metals and non-metallic matter, particularly combustibles (rubber, plastic, fabric, etc.)	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12.	
Grade-Specific Additional Requirements	Free of tin-coated steel.	
Combustible Non-metallic Content	Aim for maximum of:	0.05% by weight: 20 lbs in 40,000 lbs, or 70 lbs in 140,000 lbs

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	2 Ft. Busheling	
Grade Code	608C	
Dimensions	Thickness	Under 1/8"
	Maximum Length X Width	2' X 2' or under
Bulk Density (lbs/cu ft)	Aim	60+
	Downgrade: To Mixed Busheling if over 2 Ft., Or if Bulk Density under...	50
Description	Clean, coated or uncoated, hot- or cold-rolled, new production, carbon steel sheet scrap.	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 6-8.	
Grade-Specific Additional Requirements	May be painted or galvanized. All other coating substances require prior approval	
	Includes Slitter Scrap and Shredded Clips	
	Free of non-metallic materials	
	Free of Tin-coated steel and Silicon steel	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Derivative Grade	Mixed Busheling	
Derivative Grade Code	608J	
Dimensions	Thickness	Under 1/8"
	Maximum Length X Width	6' X 3'
Bulk Density (lbs/cu ft)	Aim	44+
	Downgrade:	
	• To Mixed Heavy Melt, if under...	40
	• Reject if under...	32
Derivative Grade Description	Material characterized by this specification must otherwise meet the specifications for grade code 608C	
General Requirements	All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12	
Grade-Specific Additional Requirements	May be painted or galvanized. All other coating substances require prior approval	
	Free of non-metallic materials	
	Free of Tin-coated steel and Silicon steel	
	Free of coils, mandrels, etc.	
	Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.	

Chaparral Virginia Specification for Ferrous Scrap

Grade Name Pig Iron

Grade Code 615A

Description Virgin iron units in pig ingot form produced via blast furnace or similar technology.

Chaparral seeks to purchase material that is low in phosphorous and sulfur.

General Requirements All material supplied must meet Chaparral's "General Specifications for Prepared Ferrous Scrap". See SPECIFICATIONS, pages 7-12.

Grade-Specific Additional Requirements Maximum pig weight: 50 lbs (unless otherwise agreed upon by Chaparral)

Due to variation in product from various suppliers, complete description of the material purchased, including but not limited to chemistry and size distribution, will be agreed upon at time of purchase.

Nominal desired chemistry:

Element	Composition
Carbon (C)	3.5 – 4.5%
Sulfur (S)	0.05 % MAX
Phosphorous (P)	0.08 % MAX
Silicon (Si)	0.70 % MIN

Chaparral Virginia Specification for Ferrous Scrap

Grade Name	Processed Iron	
Grade Code	617P	
Dimensions	Maximum Length X Width	12" X 24"
Mass	Maximum Weight per Piece	300 lbs
Description	Drop-broken or otherwise processed desulfurized iron from blast furnace or other iron operations. Material characterized by this specification must otherwise meet the specification for grade code 616D (Pig Iron).	
General Requirements	All material supplied must meet Chaparral Steel's "General Specifications for Prepared Ferrous Scrap Supplied for Direct Furnace Charging." See SPECIFICATIONS, pages 7-12.	
Grade-Specific Additional Requirements	<p>Minimum metallic iron content of pieces: 85%.</p> <p>Average metallic iron content of shipment: at least 87%.</p> <p>Maximum average sulfur content of any 1000 lb. sample (including sulfur contained in any adhering or entrapped slag): 0.080%</p> <p>Mercury (including mercury-containing capsules from convenience light switches), lead-containing components, free organic liquids, and chlorinated plastics must be depleted, to the extent practicable, from the scrap.</p>	