

Gray Iron

1. SCOPE

1.1 This specification covers different grades of material for Gray Iron castings. Some of these grades shall follow ASTM A159 requirements. Additional test requirements are specified in this specification and shall also be performed.

1.2 This specification may involve hazardous materials, procedures, and apparatus. This specification does not address the health and safety problems associated with its application or use. It is the specification user's responsibility to follow appropriate health or safety practices and determine the application or regulatory limitation before use.

2. DESIGNATION

2.1 TYPICAL CALL OUT ON ENGINEERING DRAWINGS

2.1.1 In material block of drawing:

CAST IRON PER NH GRADE 3000
 CAST IRON PER NH GRADE 3500
 CAST IRON PER NH GRADE 4000
 CAST IRON PER 86529218 GRADE Q&T

2.1.2 In part list block of drawing:

86529650 GRAY IRON G3000 86529218
 86529651 GRAY IRON G3500 86529218
 86529652 GRAY IRON G4000 86529218
 86542835 GRAY IRON Q&T 86529218

3. RELATED SPECIFICATIONS

3.1 REFERENCE STANDARDS

ASTM A159—Automotive Gray Iron Castings
 86507096 (FNHA-3-A-010.00)—Casting Supplier
 Code and Identification Markings
 86507097 (FNHA-4-A-005.00)—Casting Quality
 Acceptance Guidelines
 New Holland Initial Sample Report Process, Sec. 9

3.2 This standard replaces the following
 company standard:

New Holland (Partial) 2.50.4

4. REQUIREMENTS

4.1 MECHANICAL PROPERTIES

4.1.1 HARDNESS: Castings hardness shall conform to requirements in Table 1 unless otherwise specified on the Engineering drawing. Hardness requirements shall be designated at a specific critical location and noted on the Engineering drawing with the term "HARDNESS MEASURING POINT". This location will be the controlling section, having the specified hardness and required properties for that given wall thickness. Other wall thicknesses may have slightly different mechanical properties depending on section size. For hardness requirements at critical sections alternate locations may be checked provided adequate correlation with the required areas have been established. This should be negotiated with the Supplier and approval obtained from Materials Engineering. When specific properties are required and noted on the Engineering drawing, they shall be applicable to a standard test specimen machined from the casting

					NAME	STD GRAY IRON		
ALL	F	TD	120807	12MAR03	 NEW HOLLAND	ENGINEERING SPECIFICATION		
ALL	E	TH	117665	2/02				
ALL	D	RLF	110244	7/97				
ALL	C	IE	109326	12/96				
ALL	B	BJF	108931	4/96				
ALL	A	RE	107244	11/95				
FRAME NO.	REV	BY	ECN NO.	DATE	THE INFORMATION HEREON IS THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF NEW HOLLAND N. V. AND/OR ITS SUBSIDIARIES. ANY USE, EXCEPT THAT FOR WHICH IT MAY BE LOANED, IS PROHIBITED.	FRAME 1	OF 3	PART NUMBER
APP.	DRAWN	MLN	11/95					
KHH 1/96	CHECKED							

at the section indicated. It is the foundry's responsibility to meet all requirements on part drawings.

4.1.2 TENSILE SPECIFICATIONS: The grade shown in Table 1 indicates the tensile range required of the test bars and not the specific cast parts. It shall be understood that these properties are only approximations of the actual casting strength which may vary based a section dimensions.

ENGINEERING SHOULD NOT USE THIS DATA AS A RIGID GUIDE IN THEIR DESIGN

4.2 METALLURGICAL REQUIREMENTS

4.2.1 MICROSTRUCTURE: The microstructure shall be consistent with the requirements indicated in the ASTM A159 specification for all ASTM grades in this specification. The Q&T grade matrix microstructure shall consist of tempered martensite and the graphite flake shall conform to the ASTM A159 requirements.

4.2.2 CHEMICAL COMPOSITION: The ranges in composition generally used in making the various grades of gray iron are shown in Table 2. Since the specific composition for a given grade may vary according to the section size or process used to produce the casting, suppliers are required to check and report the major components as listed on Table 2. Reporting of the trace elements is not required. The Q&T grade chemical composition shall be typical of the grade 3000, unless heavy sections require a change in composition due to a needed increase in hardenability.

4.3 FERRITIC RIM

Ferritic rim on surfaces of gray iron castings is a soft skin (50 or more BHN points less than specified BHN) from 0 to 1/4 inch deep. All gray castings are vulnerable, but some are more prone

than others. Particular problem areas are corners, edges, teeth and other protruding surfaces. The softer surface rim in gray iron is similar to a decarburized gradient from the surface to a point where normal conditions exist. This gradient is mostly ferritic at the surface to increasing amounts of pearlite until the normal matrix is reached. A ferritic microstructure will not respond to conventional furnace hardening and/or selective flame or induction hardening heat treatments. A corrective heat-treatment can be used to remove the effects of ferritic rim.

4.4 HEAT-TREATED GRAY IRON CASTINGS

All hardened gray iron casting drawings will specify the following note above the title block:

"FERRITIC RIM NOT PERMISSIBLE"

All foundries must take steps to eliminate ferritic rim before parts are received by New Holland N.A., Inc.

CAUTION: Induction type of heat-treating of gray iron castings is not recommended for general use and its usage is "restricted". Consult with the metallurgist when considering this type of heat-treatment.

4.5 NON-HEAT-TREATED GRAY IRON CASTINGS

If the ferritic rim condition can not be tolerated on all or certain surfaces of a gray iron casting, the drawing must specify the following note above the title block:

"FERRITIC RIM NOT PERMISSIBLE ON INDICATED SURFACES"

The foundry must take steps to insure the casting is free of ferritic rim condition on indicated surfaces.

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ENGINEERING SPECIFICATION				REV. F	FRAME 2	OF 3