

1.0 DESCRIPTION

Steel – Carbon

2.0 APPLICATION

Direct hardened and induction-hardened parts.

3.0 QUALIFYING SPECIFICATIONS

The following specifications further qualify 1E0360:

- 1E0024B Wrought Steel - General Requirements
- 1E2177 Mill Tolerances - Steel Products
- 1E2349 Materials Application - Substitute
- 1E2700A Strand Cast Steel - Caster Class 2 (For Seamless Tubing)
- 1E2700B Strand Cast Steel - Caster Class 1 (For Plate)
- 1E2700C Strand Cast Steel - Caster Class 1B (For Welded D.O.M. Tubing)
- 1E2700C Strand Cast Steel - Caster Class 2 (For All Remaining Forms)

Note: Strip used for welded DOM tubing must meet 1E2700C requirements.

4.0 FORM

Semifinished for Forging
Hot Rolled Bars and Bar Sized Shapes
Cold Finished Bars
Plates
Hot Finished Seamless and Cold Drawn Seamless Tubing*
Hot Rolled Sheet

Note*: Cold drawn seamless tubing shall be stress relieved.

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STEEL – CARBON (1040 MODIFIED)

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1E0360

5.0 COMPOSITION, % (HEAT ANALYSIS)

	Sheet, Plate & Tubing	All Other Products
Carbon	0.37 - 0.44	0.39 - 0.45
Manganese	0.60 - 0.90	0.60 - 0.90
Phosphorus	0.040 MAX	0.040 MAX
Sulfur	0.050 MAX	0.050 MAX
Silicon	0.15 - 0.35	0.15 - 0.35

5.1 1E0024 DI value shall be 21.6 – 36.8 mm for plate (not applicable to sheet and plate less than 8 mm thick). All other material shall have a DI of 25.4 – 33.0 mm.

5.2 Suppliers shall report residual alloy content and grain size on shipping notices or data certificates.

6.0 AUSTENITIC GRAIN SIZE

5 or finer, grain refined with aluminum.

7.0 SUBSTITUTE MATERIALS

7.1 Substitute materials allow the chemical compositions of certain National Standard grade steels to be used in place of 1E specification chemistries, per the guidelines of 1E0024 and 1E2349 – Substitute Materials Application. **When procuring any of the following substitute grades, all other quality requirements of the original 1E specification shall be met, such as approved mill, reduction ratio, caster class, tensile strength, DI, grain size, etc.**

7.2 If steel purchasers do not understand these issues, they must buy materials to the 1E material specification or employ the services of Caterpillar Global Purchasing to assist in the material acquisition.

7.3 1E2349 governs approval requirements and procedures. This specification must be read and understood before using any of the substitute materials listed below.

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Caterpillar	1E0361	1E2349C
ASTM A576	Grades 1040, 1042	1E2349B
ASTM A576	Grade 1045	1E2349C
ASTM A519	Grade 1040	1E2349B
ASTM A108	Grade 1040	1E2349B
ASTM A108	Grade 1045	1E2349C
AS 1442	Grade 1040	1E2349B
AS 1443	Grade 1040	1E2349B
AFNOR NF EN 10083 – 1	Grade C40	1E2349B
BS 970	Grade 080A40	1E2349B
JIS G4051	Grades S40C, S43C, S45C	1E2349B
DIN EN 10083 – 1	Grade C40	1E2349B
GB699	Grades 40, 40Mn	1E2349B

8.0 SUBSIDIARY VERSIONS (FOR CATERPILLAR REFERENCE ONLY)

8.1 At the time of release of 1E0360, Change 26, the following subsidiary versions of 1E0360 were in use by Caterpillar facilities outside of the United States.

Caterpillar Matériels Routiers S.A. (Rantigny)	"H" Version
Caterpillar Brazil S.A. (Piracicaba)	"G" Version
Caterpillar Belgium S.A. (Gosselies)	"V" Version
Caterpillar France S.A. (Grenoble)	"H" Version
Caterpillar Japan Ltd (Sagami)	"X" Version
Caterpillar Japan Ltd. (Akashi)	"X" Version

Figure 1

8.2 Subsidiary versions may be changed, released, or canceled without a change to this version of 1E0359. The Engineering Data System (EDS) provides information on the status of subsidiary version specifications and should be referenced for current information.

9.0 REFERENCES

Caterpillar Specification	1E0361, 1E2349B, 1E2349C
ASTM	A108, A519, A576
AS	1442, 1443
AFNOR NF EN	10083-1
BS	970
JIS	G4051
DIN EN	10083-1
GB	699

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