

API Specification

8C

5thth Edition, April 2012

Specification for Drilling and Production
Hoisting Equipment (PSL 1 and PSL 2)

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1.0 PRODUCT DESCRIPTION

Specification 8C includes the following requirements for product ordered and may be applicable in addition to any product-specific requirements listed in other sections identified herein:

1.1 PRODUCTS

1.1.1

API Specification 8C – 1 Scope

This Standard provides requirements for the design, manufacture and testing of hoisting equipment suitable for use in drilling and production operations.

This Standard is applicable to the following drilling and production hoisting equipment:

- a) hoisting sheaves;
- b) travelling blocks and hook blocks;
- c) block to hook adapters;
- d) connectors and link adapters;
- e) drilling hooks;
- f) tubing hooks and sucker rod hooks;
- g) elevator links;
- h) casing elevators, tubing elevators, drill pipe elevators and drill collar elevators;
- i) sucker rod elevators;
- j) rotary swivel bail adapters;
- k) rotary swivels;
- l) power swivels;
- m) power subs;
- n) spiders, if capable of being used as elevators;
- o) wire line anchors;
- p) drill string motion compensators;
- q) kelly spinners, if capable of being used as hoisting equipment;
- r) pressure vessels and piping mounted onto hoisting equipment;
- s) safety clamps, if capable of being used as hoisting equipment;
- t) guide dollies for traveling equipment (e.g. hooks, blocks, etc.).

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1.2 PRODUCT SPECIFICATION LEVEL

1.2.1

API Specification 8C – 1 Scope

This Standard establishes requirements for two product specification levels (PSLs). These two PSL designations define different levels of technical requirements. All the requirements of Section 4 through Section 11 are applicable to PSL 1 unless specifically identified as PSL 2. PSL 2 includes all the requirements of PSL 1 plus the additional practices as stated herein.

1.2.2

API Specification 8C – 6.3.7

PSL 2 components shall be fabricated from materials meeting the applicable requirements for ductility specified in Table 2.

Table 2—Elongation Requirements (PSL-2)

Yield strength		Elongation, minimum %	
MPa	(ksi)	$L_o = 4d^a$	$L_o = 5d^a$
Less than 310	(less than 45)	23	20
310 to 517	(45 to 75)	20	18
Over 517 to 758	(Over 75 to 110)	17	15
Over 758	(Over 110)	14	12

^a Where L_o is the gauge length and d is the diameter.

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1.2.3

API Specification 8C – 8.4.7.4.1

The acceptance criteria shall be as specified in Table 4 for PSL 1 and Table 5 for PSL 2.

Table 4—PSL 1—Maximum Allowable Degrees for Discontinuities

Type	Maximum Allowable Degree		
	Discontinuity Descriptions	Critical Areas	Non-critical Areas
I	Hot tears, cracks	None	Degree 1
II	Shrinkage	Degree 2	Degree 2
III	Inclusions	Degree 2	Degree 2
IV	Internal chills, chaplets	Degree 1	Degree 1
V	Porosity	Degree 1	Degree 2

Table 5—PSL 2—Maximum Allowable Degrees for Discontinuities

Type	Maximum Allowable Degree		
	Discontinuity Descriptions	Critical Areas	Non-critical Areas
I	Hot tears, cracks	None	None
II	Shrinkage	None	Degree 1
III	Inclusions	Degree 1	Degree 2
IV	Internal chills, chaplets	None	Degree 1
V	Porosity	Degree 1	Degree 2

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2.0 DESIGN REQUIREMENTS

2.1 ROTARY SWIVEL CONNECTIONS

2.1.1 API Specification 8C – 9.9.4.1

The angle between the gooseneck centerline and the vertical shall be 15 degrees. The connection size and type shall be agreed by the purchaser and manufacturer and specified on the purchase order.

2.1.2 API Specification 8C – Figure 12

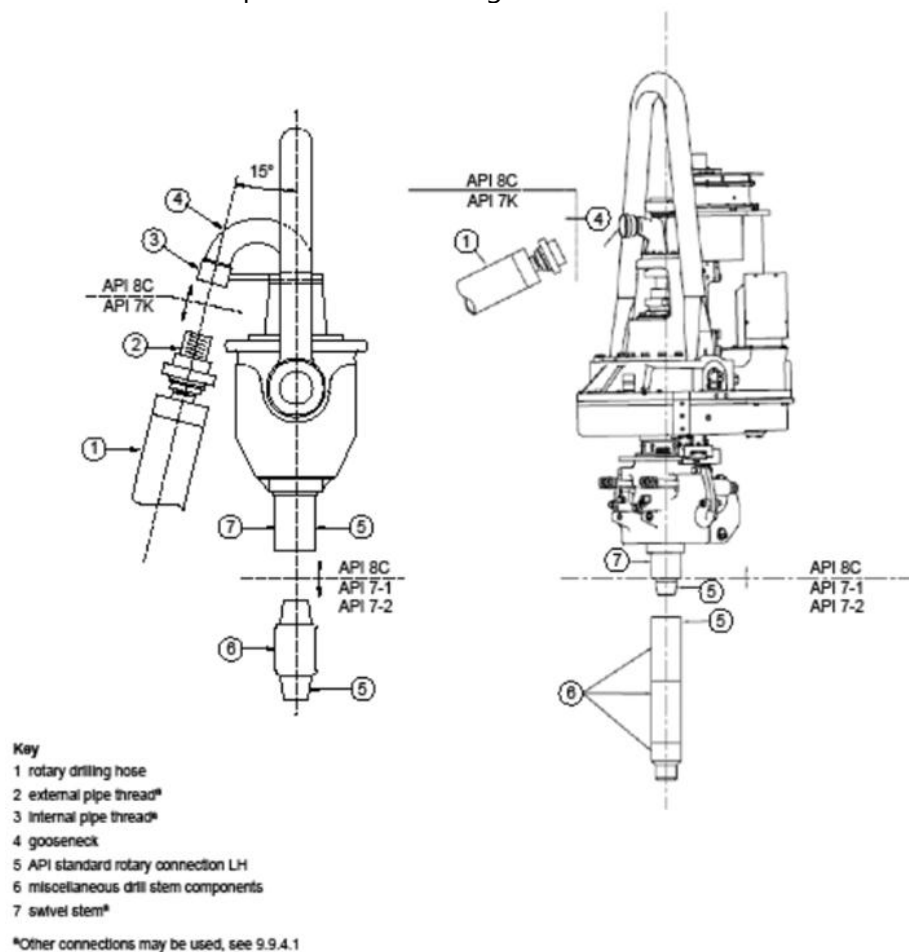


Figure 12—Rotary Swivel Connections

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3.0 DOCUMENTATION REQUIREMENTS

3.1 DOCUMENTATION

3.1.1

API Specification 8C – 11.1

Full records of the documentation specified in Section 11 shall be kept by the manufacturer for a period of ten years after the equipment has been manufactured and sold.

Documentation shall be clear, legible, reproducible, retrievable, and protected from damage, deterioration, and loss.

All quality records shall be signed and dated. Computer sorted records shall contain the originator's personal code.

The manufacturer shall make available all records and documentation for examination by the purchaser, or his agents, to demonstrate compliance with this Standard.

3.2 DELIVERED DOCUMENTATION

3.2.1

API Specification 8C – 11.3

A comprehensive data book may be specified by supplementary requirement SR 3 (see Annex A) in the purchase order, otherwise, the following documentation shall be delivered with the equipment:

- a) The manufacturer's statement of compliance, attesting to full compliance with the requirements of this Standard and any other requirements stipulated by the purchase order. The statement shall identify any noted deviations from the specified requirements;
- b) Proof load test record (as applicable);

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c) Operations/maintenance manuals which shall include, but not be limited to:

- assembly drawings and critical-area drawings;
- list of components;
- nominal capacities and ratings;
- operating procedures;
- wear limits, including elevator bore wear limits (see API 8B, Table 2, for method of computing and limitations on wear limits);
- recommended frequency of field inspection and preventive maintenance, methods and acceptance criteria;
- dropped object prevention guidelines;
- itemized spare parts (not applicable to single-component equipment) and recommended stock levels;
- for PSL 2, capacity changes as a result of wear.

3.3 PURCHASE ORDER - SUPPLEMENTARY REQUIREMENTS

3.3.1

API Specification 8C – Annex A.1

If specified in the purchase order, one or more of the following supplementary requirements shall apply.

3.3.2

SR 1 Proof Load Test

API Specification 8C – Annex A.2

The equipment shall be given a proof load test and subsequently examined in accordance with 8.6.2.

The equipment shall be marked "SR 1" using low stress, hard die stamps near the load rating identification. Marking "SR 1" is not required on equipment for which proof load testing is normally required under Section 8 or Section 9.

3.3.3

SR 2 Low Temperature Test

API Specification 8C – Annex A.3

The maximum impact test temperature for materials used in primary load carrying components with a required minimum operating temperature below $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$) shall be specified by the purchaser.

Impact testing shall be performed in accordance with 6.3 and ASTM A370. The minimum average Charpy impact energy of three full-size test pieces, tested at the specified (or lower) temperature,

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shall be 27 J (20 ft-lb) with no individual value less than 20 J (15 ft-lb).

Each primary load carrying component shall be marked "SR2" to indicate that low temperature testing has been performed. Each primary load carrying component shall also be marked to show the actual design and test temperature in degrees Celsius.

3.3.4

SR 3 Data Book

API Specification 8C – Annex A.4

If specified by the purchaser, records shall be prepared, gathered and properly collated by the manufacturer into a data book. The data book for each unit shall include at least the following:

- statement of compliance;
- equipment designation/serial number ;
- wear limits and nominal capacities and ratings;
- list of components;
- traceability codes and systems (marking on parts/records on file);
- steel grades;
- heat treatment records;
- material test reports;
- NDE records;
- performance test records including functional hydrostatic and load testing certificates (when applicable);
- supplementary requirements certificates as required;
- welding procedure specifications and qualification records.

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3.3.5

SR 4 Additional Volumetric Examination of Castings

API Specification 8C – Annex A.5

The requirements for SR 4 shall be identical to the requirements of 8.4.8, except that all critical areas of each primary load carrying casting shall be examined.

3.3.6

SR 5 Volumetric Examination of Wrought Material

API Specification 8C – Annex A.6

The entire volume of primary load carrying wrought components shall be examined by the ultrasonic method. If examination of the entire volume is impossible due to geometric factors, such as radii at section changes, the maximum practical volume shall suffice. Ultrasonic examination shall be in accordance with ASTM A388 (the immersion method may be used) and ASTM E428. Straight beam calibration shall be performed using a distance amplitude curve based on a flat bottomed hole with a diameter of 3.2 mm (1/8 in.) or smaller.

Wrought components examined by the ultrasonic method shall meet the following acceptance criteria:

- a) for both straight and angle beam examination, any discontinuity resulting in an indication which exceeds the calibration reference line is not allowed. Any indication interpreted as a crack or thermal rupture is also not allowed;
- b) multiple indications (i.e. two or more indications), each exceeding 50 % of the reference distance amplitude curve and located within 13 mm (1/2 in.) of one another, are not allowed.

3.3.7

SR 6 Boreback Stress-relief Feature

API Specification 8C – Annex A.7

When requested by the purchaser, the boreback box stress-relief feature shall be a supplementary requirement for 9.9.5, 9.10, and 9.11.3. The connection shall conform to the applicable requirements as specified in API 7 for the drill collar boreback box stress-relief feature.

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4.0 REPAIR/REMANUFACTURE REQUIREMENTS

4.1 Repair/Remanufacture

4.1.1

API Specification 8C – 7.8.3

All repair welding shall be performed in accordance with the manufacturer's welding procedure specifications. Welding procedure specifications shall be documented and shall be supplied at the purchaser's request.

Prior to any repair the manufacturer shall document the following criteria for permitted repairs:

- defect type;
- defect size limits;
- definition of major/minor repairs.

All excavations, prior to repair, and the subsequent weld repair shall meet the quality control requirements specified in Section 8.