

API Spec 16C - Specification for Choke and Kill Systems

Last update: December 17, 2014

Standard	Edition	Section	Inquiry #	Question	Reply
16C	1st Edition Jan. 1993	1.4.2	16C-01-09	<p>Question 1: Clause 1.4.2 states products listed in 1.2.2 that have requirements established in API 6A shall have a minimum PSL 3, Material Class EE and a temperature rating from 3.5.2 as appropriate. Are all of the products listed in sec. 1.2.2 covered in this category, irrespective of PSL levels and temperature class?</p> <p>Question 2: Is it possible to monogram a choke & kill manifold if the requirements meet API 6A, PSL 2 and Material Class DD?</p> <p>Question 3: In a choke & kill manifold, few low alloy steel items (crosses, tees, flanged, studded, hubs, etc.) are pressure control parts and are material class DD. Very few items, like valves and chokes with stainless pressure controlling parts, fall under the category of Material Class EE, therefore, no choke and kill manifold is fully covered under API 6A, Material Class EE. In this can this system be monogrammed under 16C?</p>	<p>Reply 1: Yes, the equipment listed in 1.2.2 must have be PSL 3, material class EE, and a temperature rating in accordance with 3.5.2 to comply with 16C, as stated in 1.4.2.</p> <p>Reply 2: No, this does not comply with 1.4.2</p> <p>Reply 3: Although Section 1.4.2 refers to the material class EE, it does not apply to crosses, tees, etc. that do not have pressure-controlling parts. The bodies, bonnets, end, and outlet connections (second column of the table) for Material Classes DD and EE are the same, therefore the crosses, tees, etc. meet the intent of the paragraph requirement when manufactured to the Material Class EE.</p> <p>The choke and kill manifold can be monogrammed under API Spec 16C with the material class requirement of Material Class EE for the API 6A components referenced in 1.4.2.</p>
16C	1st Edition Jan. 1993	3.6	16C-03-13	<p>Background: In API Spec 16C Section 3.6, it references closure bolting and the requirements for stress calculation. In Section 9.8 the specification also states that "the requirements for studs and nuts apply only to those used to connect end and outlet flanges. The requirement for studs and nuts are found in API Spec 16A or 6A." At our facility we simply purchase API 6A valves and components and assemble the choke manifold. Additionally, closure bolting is not defined in API 16C's definitions section.</p> <p>Question: Are we required to do bolting calculations in accordance with API 16C or API 6A, or can we simply to purchase studs and nuts in accordance with API 6A size recommendations with B7/2H or B7M/2HM certification?</p>	<p>Section 3.6 requires bolting stress calculations for proprietary connections such as bonnets. Calculations are not required for bolting specified in API 6A or API 16A for API standard connections.</p> <p>Note: the definition for bolting includes closure bolting.</p>

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16C	1st Edition Jan. 1993	4.1.3	16C-02-13	<p>Question 1: Can API Spec 16C, Section 4.1.3 apply to pressure-containing materials used for rigid piping?</p> <p>Question 2: Does API 16C require volumetric NDE for all pressure-containing materials, including rigid piping?</p>	<p>Reply 1: Only if the material of construction is actually special corrosion and abrasion resistant materials, coatings, or facings, as stated in 4.1.3.</p> <p>Reply 2: Yes. Rigid piping is classified as a pressure containing part as stated in 6.3.15.1. Table 6.3.15.2 defines the quality control requirements for rigid piping, and specifically requires volumetric NDE in accordance with 6.3.6.10, which specifies either ultrasonic examination or radiographic examination.</p>
16C	1st Edition Jan. 1993	6.3.6.9	16C-02-14	<p>Section 6.3.6.9 requires accessible surfaces of each finished part be examined after final heat treatment and final machining. Is surface NDE required whether or not the part has been machined?</p>	<p>Yes, surface NDE must be performed on all accessible surfaces of each finished part.</p>
16C	1st Edition Jan. 1993	6.4	16C-01-08	<p>Background: We have noted that per Table 6.4.1, hydrostatic testing and section 6.4.13 are applicable to manifold assemblies. Section 6.4.13 states: "Manifold assemblies with parts having different working pressures, the lowest rated working pressure shall be used to determine the test pressure."</p> <p>In our case we have a choke and kill manifold rated for 10,000 psi working pressure with a 5000 psi flange on the outlet side. Based on Section 6.4.13 we have tested the manifold to 10,000 psi (per Table 6.4.5). On the inlet side we have valves, spool adapters, studded blocks rated for 10,000 psi of which only the valves have been tested by the manufacturer's to 15,000 psi. The spool adapters and 5-way studded blocks (made of 75,000 psi material) have been tested at 10,000 psi only as part of the choke and kill manifold assembly.</p> <p>Question 1: Is this testing of the spool adapters, studded blocks to 10,000 psi on the inlet side as a part of the C&K manifold testing acceptable for a 10,000 Rated Working Pressure C&K manifold?</p> <p>Question 2: Do we need to individually test the spool adapters and studded blocks to 15,000 psi (for a 10,000 psi rated working pressure choke and kill manifold) before final assembly into the manifold?</p>	<p>Reply 1: No. The adapters, blocks, etc. are products produced under API 6A. These products are tested to their full test pressure prior to installation into the manifold assembly. The only product tested at the lower test pressure is the component with the 5000 psi flanged outlet. See 1.2.2 for other equipment included in API 16C, but covered by other API Specifications.</p> <p>Reply 2: No. See Reply 1.</p>

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16C	1st Edition Jan. 1993	6.4.1	16C-02-08	<p>Background: We have noted that per Table 6.4.1, hydrostatic testing and section 6.4.13 are applicable to manifold assemblies. Section 6.4.13 states:</p> <p>“Manifold assemblies with parts having different working pressures, the lowest rated working pressure shall be used to determine the test pressure.”</p> <p>In our case we have a choke and kill manifold rated for 10,000 psi working pressure with a 5000 psi flange on the outlet side. Based on Section 6.4.13 we have tested the manifold to 10,000 psi (per Table 6.4.5). On the inlet side we have valves, spool adapters, studded blocks rated for 10,000 psi of which only the valves have been tested by the manufacturer's to 15,000 psi. The spool adapters and 5-way studded blocks (made of 75,000 psi material) have been tested at 10,000 psi only as part of the choke and kill manifold assembly.</p> <p>Question 1: Is this testing of the spool adapters, studded blocks to 10,000 psi on the inlet side as a part of the C&K manifold testing acceptable for a 10,000 Rated Working Pressure C&K manifold?</p> <p>Question 2: Do we need to individually test the spool adapters and studded blocks to 15,000 psi (for a 10,000 psi rated working pressure choke and kill manifold) before final assembly into the manifold?</p>	<p>Reply 1: No. The adapters, blocks, etc. are products produced under API 6A. These products are tested to their full test pressure prior to installation into the manifold assembly. The only product tested at the lower test pressure is the component with the 5000 psi flanged outlet. See 1.2.2 for other equipment included in API 16C, but covered by other API Specifications.</p> <p>Reply 2: Yes. See Reply 1.</p>
16C	1st Edition Jan. 1993	6.5.3	16C-02-14	<p>Question 1: Section 6.5.3 requires information on filler material be included in the records that are maintained by the manufacturer. Can only generic filler material records be included in these records, or is the heat/batch number of the filler material required?</p> <p>Question 2: Section 6.5.3 requires NDE personnel qualification records be included in the records to be maintained by the manufacturer. Frequently, pressure-containing equipment receives volumetric NDE at a mill and it is sometimes difficult to get the NDE technician's name and qualifications from the mill that manufactured the material. Does this mean that if a mill performs the NDE and the manufacturer (in this case the purchaser) cannot obtain the NDE technician's certifications, the manufacturer/purchaser must perform the NDE again?</p>	<p>Reply 1: The records of the actual welder ID, weld procedure used, the filler metal used, and the post-weld heat treatment used in the process of the actual part being manufactured are required.</p> <p>Reply 2: NDE personnel qualification records, are required to be retained by the manufacturer of the component/material and accessible for review by the purchaser of the material if necessary.</p>

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16C	1st Edition Jan. 1993	9	16C-02-08	<p>Background: Sections 9, 9.1, 9.2, and 9.3 outline the performance verification procedures. It does not specifically state that these performance verification procedures shall be done for all products covered by API 16C. In further parts of Section 9, specific performance verification procedures and requirements are given for various products (i.e. non-metallic seals, drilling chokes and actuators, flexible choke and kill lines, and articulated choke and kill lines) and these earlier sections are then referenced in each equipment's individual section.</p> <p>Is it a requirement that all other components covered by API 16C, but do not have a reference to performance verification procedures in their specific section (i.e. Section 9.6: Unions and Swivel Joints), also have a performance verification testing done in accordance with Sections 9.3 which requires temperature cycle testing?</p>	Yes. It is the intent that all products listed in 1.2.1 are tested in accordance with the requirements of the API 16C. Although there are no moving parts, the temperature/pressure cycle may exhibit problems related to the thermal expansion and contraction of the product.
16C	1st Edition Jan. 1993	9.4	16C-05-14	<p>Background: API 16C references API 6A in Section 1.3, Service Conditions, and 1.4 Product Specifications. Section 9.4 of 16C outlines the requirements for testing of non-metallic seals and a standard test fluid in Table 9.4.4 which is similar to but apparently not as severe as the testing called out in Annex F, Section F.1.13 "Testing of non-metallic seals" and specifically for the test fluid described in Table F.2 for material class FF/HH.</p> <p>Question: Are non-metallic seals qualified to Annex F, Material Class FF/HH approved for use in API 16C equipment?</p>	No; the API 6A test does not address the high amounts of brine and CO2 possible in drilling situations.
16C	1st Edition Jan. 1993	9.9	16C-01-11	<p>Are adjustable drilling chokes intended for full sealing from at the valve seat in accordance with Clauses 6.4.6.3, 9.9.10, 9.9.11, and 9.10.3.6 (Point 3 and 6) of API 16C?</p>	Although API 16C, Clause 9.9, states "drilling chokes are not intended to be used as shut off valves", Clause 9.10.3.6 3) states "if the choke does not provide complete shut off capability, it shall attain the maximum operating pressure contained in the choke manufacturer's written specification."
16C	1st Edition Jan. 1993	9.16.6	16C-04-14	<p>Section 9.16.6, about choke console accumulators, states that the accumulator shall have a volumetric capacity to operate the choke from fully open to fully closed and return to fully open. Does the required amount of volume mentioned above need to be at a pressure that is high enough to move the choke under working pressure until the full open and close is accomplished?</p>	The choke must operate at rated working pressure; therefore the accumulator must move the choke at rated working pressure as well.

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16C	1st Edition Jan. 1993	10.9	16C-01-13	<p>Question 1: Regarding Section 10.9, is the intent of these requirements that the chokes can be controlled from at least one remote (not at the choke manifold) location?</p> <p>Question 2: If more than one remote console is available, is each required to meet the functional requirements of 10.9.1?</p> <p>Question 3: Can one remote console have all the required gauging but no backup power system (i.e. hand pump) and conform to API 16C?</p> <p>Question 4: If one remote has a full complement of gauging and backup power, can an alternate only have a partial compliment of functional requirements?</p>	<p>Reply 1: Yes.</p> <p>Reply 2: This issue is outside the scope of API 16C. The API 16C task group will study this issue for possible inclusion in a future addendum or edition of the standard.</p> <p>Reply 3: See Reply #2.</p> <p>Reply 4: See Reply #2.</p>
16C	1st Edition Jan. 1993	10.9.1.7	16C-01-14	<p>Background: We have customers who want offshore rig console gauges labeled differently than the specific words used in API 16C. They like to use other terms which are equivalent, and to insure consistency within their drilling fleet. In the drilling industry, "Drill Pipe Pressure" is also called "Pump Pressure", "Standpipe Pressure", and "Upstream Pressure". "Casing Pressure" is also frequently called "Choke Pressure", "Downstream Pressure", or "Manifold Pressure". All describe the same pressure, they are just different terms used by various companies.</p> <p>Question: Referring to Section 10.9.1.7, can drill pipe and casing pressure gauges be labeled differently than what is specified and claim compliance with API 16C?</p>	<p>No. Section 10.9.1.7 requires the control system to have drill pipe and casing pressure gauges that are clearly marked "Drill Pipe Pressure" or "Casing Pressure" respectively.</p>
16C	1st Edition Jan. 1993	9.14.2	16C-02-09	<p>Section 9.14.2 refers to Table 3.5.2.1 for the temperature rating of flexible choke and kill lines. During the prototype test of the U temperature rated line (-18 to +121°C), we carried out the cold bending test at temperature lower than -18°C. Is it allowable to mark the hose with the actual temperature of the test, or must the hose be marked with the temperature given in Table 3.5.2.1?</p>	<p>The hose must be marked in accordance with the limits as stated in Table 3.5.2.1.</p>